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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

No comment

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Does the Fed need to create/manage the CBDC? Could a partnership be a better approach?

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Yes, it could and likely will. The answer to this question depends on how it's structured.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

I think it could be a more efficient way to inject/remove liquidity into the markets.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

If the CBDC is weaponized. Meaning, if it's used to restrict people from spending, transferring, or using money.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Yes, it could adversely affect the financial sector.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

The Fed (or any government institution) should not be allowed to freeze account without going through legal due process.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Cash usage is declining. Younger people (millennials) don't want to carry cash or use it. However, this factor does not justify the creation of a CBDC.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Through use of stablecoins - USDC, GUSD, etc.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

We need to do what's right for the US, not follow the heard. The US became the center of innovation for the internet because foolish restrictions were not placed on top of the industry. The EU placed these foolish restrictions around the internet in the early days and missed out big time. Blockchain is the next big innovation and the US needs to allow it to flourish. CBDCs could be a part of this, but it needs to be thoughtful and not restrict other innovation within the blockchain space.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Don't issue one.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

I don't know, but if a CBDC is issued, these things better be figured out. They must be in place.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

Perhaps, but it should NEVER be the only legal tender. Cash must always remain an option.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Why? I don't understand this thinking at all. People are limited on the # of USD they can earn/hold. Either CBDCs are issued or they are not. The fact this question is being asked scares me to some extend.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

It is critical that CBDCs: 1. Do not negatively impact privacy 2. Are never used to freeze assets without due process through the US court systems 3. Do not restrict or limit blockchain innovation in anyway.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Privacy must be maintained and prioritized

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Privacy must be maintained and prioritized CBDCs should not limit the development of other cryptos within the US Assets should not be freezable without due process Laws and regulations around crypto need to be updated and quickly. Currently, it's a hodge podge across the SEC, CFTC, and other institutions. Often these laws were created before the internet was even around.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Due to its limited scope, the paper does not address the fundamental nature of the economic forces that distort the money flow in our economy and cause recurring economic instability, which a CBDC could help solve if structured properly. If carefully designed, a CBDC could give the Federal Reserve direct and immediate control over consumer demand. In recent decades the money flow in our economy has become very distorted with a larger and larger portion of the money flowing to Wall Street, such that the people on Main Street can no longer buy back the value of the goods and services that they can produce at full employment. The low interest rates have discouraged savings and encouraged debt. Consequently, the people on Main Street go deep into debt. But even this is not enough to enable them to purchase our national GDP at full employment, so the government goes into debt to make up the difference. In this last round, the stimulus payments went too far, and when combined with supply shortages have resulted in excessive inflation. To stop inflation without causing a recession, CBDC bank accounts could offer a high interest rate on the first \$10,000 of savings to get those with the highest marginal propensity to consume (poor and middle-class people) to save more and spend less to reduce consumer demand. This would provide an alternative to raising interest rates on Wall Street, which just makes it harder for suppliers to borrow money to expand their production operations to meet the excess consumer demand. Structuring CBDC accounts to be very attractive to poor and middle-class people could give the Federal Reserve a much-needed tool to directly control consumer demand. Note that I-Bonds have not worked because they are not structured properly for poor and middle-class people whose fragile economic circumstances require that they have immediate access to their savings to deal with unexpected events such as a medical emergency or automobile accident. Also, the vast majority of middle-class people don't even know that I-Bonds exist, and, instead put their limited savings into certificates of deposit which typically pay less than one percent interest.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

In theory this is possible but could be problematic in practice. Private banks could be given a subsidy to offer higher interest rates on savings than they charge on borrowing. However, this introduces an intermediary that just adds cost and complexity to what would otherwise be offering direct individual CBDC accounts for everyone, but only those with a Social Security number could earn interest and the interest rate on savings would only apply to amounts up to \$10,000.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

A fundamental problem for the poor and financially disadvantaged is their lack of savings. Without savings they are unable to deal with unexpected events such as an automobile accident or a medical emergency. Consequently, any financial disruption can put them at the mercy of pawn shops, loan sharks, payday loan dealers, and "cash now" businesses that charge exorbitant rates of interest. If the poor had savings, their savings would serve as an automatic stabilizer for our economic system as a whole to keep consumer demand steady even in the face of economic downturns, which would make such downturns shorter and less severe. The most important asset that poor and middle-class families typically have is their

home. High interest rates discourage home ownership. On the other hand, low interest rates discourage savings. A bank cannot afford to offer a higher interest rate on savings than it charges on loans. But a Federal Reserve CBDC digital currency account could, especially if the high savings rate only applied to some relatively small amount of savings such as the first \$10,000 in savings, which would impact the poorest people without enabling wealthy people to transfer much from their private bank accounts and investments. Encourage poor people to invest in a home by not raising mortgage rates too high so when they get old and need to move into a retirement residential community, they have the value of their home to pay for their retirement. At the same time, they could have a savings account with up to \$10,000 to pay for unexpected emergencies. A Federal Reserve digital currency account could be open to everyone but with the right to earn interest on the money deposited in the account limited to one account per Social Security number and no more than \$10,000. In other words, an entity without a Social Security number would not be allowed to earn any interest on any money they might have in their CBDC account. With these restrictions which targets the Americans with the highest marginal propensities to consume (poor and middle-class people) the Federal Reserve could afford to offer a high enough return-on-savings interest rate to control consumer demand for goods and services.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

If the Federal Reserve created a central bank digital currency (CBDC) account for every American, the Fed could have a return-on-savings tool, which it currently lacks, to directly reduce demand pressure to stop inflation without throwing the economy into recession. Demand could be tamped down, and supply encouraged, by creating Federal Reserve CBDC savings accounts that offer high interest rates during inflationary periods on balances up to some specified limit, such as \$10,000 (with no interest earned on amounts above that limit). Interest on the first \$10,000 in the account would only apply to accounts with a Social Security number and only one account per Social Security number. Meanwhile, rates in the New York financial markets could remain relatively low to stimulate, not suppress, supply. Higher interest rates will encourage savings. Saving more and spending less is obviously what is needed when too much money is chasing too few goods. If the Fed were to offer high enough interest rates, excess demand could be reduced enough to stop inflation without forcing the economy into an unnecessary recession. This approach would withdraw money from the economy by offering a return on investment, not by taxation. People still would be able to purchase their necessities but would be motivated to delay or cut back on luxuries until the economy cools off and the CBDC account ("FedAccount") interest rates return to normal. Everyone with a Social Security number would automatically get a CBDC account and Internal Revenue (IRS) tax refunds could be deposited into these accounts. This would especially benefit the elderly who need a good return on their savings to help finance their retirement. CBDC accounts offering high interest rates also could attract savings from people with high marginal propensities to consume (poor and middle-class people) who tend to spend most of their income. Encouraging more people to save more money would also serve as an automatic stabilizer by providing people with the savings they need to ride out economic downturns, which, in turn, would make such downturns shorter and less extreme -- protecting profits and tax revenues. Currently, when the Federal Reserve raises interest rates on Wall Street, it suppresses supply for seasonal, cyclical and other businesses that depend on short-term liquidity to maintain and establish inventory and cash flow. It suppresses business. Farmers borrow money to sow their crops in the spring, then pay back the loan after the harvest is sold. Retailers borrow to cover costs until the holiday season revenues enable them to pay off loans. However, production is cut back when borrowing costs increase. High interest rates in the New York financial markets (Wall Street) also cause businesses to put off long-term investments in plant and equipment that would increase supply. This traditional approach suppresses both supply and demand as workers find less work and their incomes fall. The economy slides into recession. When the opposite conditions develop with low demand, high unemployment, and the start of a deflationary cycle, these CBDC accounts could offer small loans at relatively low interest rates to individuals and small businesses or could make direct stimulus payments. The mechanism for creating these accounts could take a page from our past. Under the Postal Savings Act of 1910, our post offices served as banks for more than 50 years from 1911 to 1966. You could go to any of our post offices (currently numbering 31,000) to cash a check or set up a savings account. Such a loan program already has been proposed in bills formulated in both the U.S. Senate and the House of Representatives in the last few years such as Senator Kirsten Gillibrand's Postal Banking Act as Senate bill S.2755 or Representative Rashida Tlaib's Public Banking Act as House bill H.R.8721. These bills are aimed at helping unbanked and underbanked people who live paycheck to paycheck and suddenly face job loss, a medical emergency, an automobile accident, or some other event that forces them to go to loan sharks, pawn shops, payday loan dealers or "cash now" providers who charge exorbitant interest rates. The Public Banking Act, which was recently introduced in the Congress to create postal savings

accounts, could be modified to provide the Federal Reserve with a return-on-savings tool to curb excessive inflation without throwing our economy into a recession. The Federal Reserve, not the taxpayers, can pay for setting up and operating the postal banks. (Note that the Federal Reserve is independently financed from its bank fees and investments, which produce enough revenue such that the Federal Reserve donates about \$80 billion to the U.S. Treasury each year.) The Federal Reserve also could help pay for postal employee pensions. This would reduce, not increase, the overall tax burden.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Yes. A CBDC could increase stability if the Federal Reserve controls the interest rate on savings in these CBDC accounts. Interest rates in the New York financial markets have been too low for too long but simply raising them in the financial markets is naïve in not recognizing the distorted money flow that has developed in recent decades in our economy and the underlining cause of the forces driving up stock and bond prices and driving down interest rates, which is the diversion of money from Main Street to Wall Street. Under ZIRP, investors have taken more and more risk making the economy increasingly less stable. The Federal Reserve has been handicapped by having tools that work primarily through the financial markets and the largest corporations with little direct impact on consumer demand. Our financial economy has become more of a gambling casino than an arena for investing in the real economy where actual products are produced and consumed. Offering high interest rates on savings in CBDC accounts that are limited to \$10,000 would enable the Federal Reserve to directly and immediately control consumer demand. In addition, changes in financial regulations are needed to discourage stock buybacks and other financial manipulations that detract from real productivity improvements in making new and better-quality products at lower prices in the real economy.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

A CBDC would divert some money from the financial sector. However, this could be limited by limiting the amount of money that would earn interest in a CBDC account (e.g., \$10,000). Also, interest could only be earned on accounts with a Social Security number with one account per Social Security number. Other entities could have CBDC accounts but could earn no interest.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

The primary way of mitigating the adverse impact on the financial sector of creating CBDC accounts would be to limit the size of the CBDC savings accounts and the CBDC loan amounts to keep them relatively small (e.g., \$10,000) and to only allow interest to be earned on one account per Social Security number. Accounts without a Social Security number would earn no interest. To have a real impact on consumer demand in the real economy, the Federal Reserve needs to target the real people on Main Street and not the wealthy people and corporations on Wall Street.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes. Originally, private banks created money in the United States, but that money was not always accepted in all regions of the U.S. Without a CBDC, the Federal Reserve will eventually lose dominance and influence over the use of money as private entities create a wider variety of various forms of money and different ways of accessing money. This development can only lead to less economic stability and more financial disruption.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

To the extent that people put their money into a wide variety of digital currencies and symbolic coinage, the stability of the overall financial system will become less reliable and less stable. We are already burdened by too much financial gambling and not enough prudent investing in real products and actual production. The absence of a U.S. CBDC only encourages the use of private, unreliable payment systems and internet gambling in alternative digital currencies that will just add to overall economic instability. Private anonymous digital currencies facilitate money laundering to avoid taxes and conceal criminal transactions, including illegal drug trafficking.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

China and several other countries have already started the process of issuing CBDCs. This will enhance China's ability to more efficiently and effectively convert all U.S. dollar inflows into Yuan with the Chinese government acquiring the U.S. dollars for its sovereign wealth funds. This will further enable China to keep U.S. dollars out of the foreign exchange markets and possibly invest such funds directly into U.S. financial markets. This is designed to keep U.S. products expensive and Chinese products relatively inexpensive in world markets. This could be countered to some degree if citizens throughout the world have some degree of direct access to U.S. CBDCs. The Federal Reserve could then indirectly play a role in how many U.S. dollars flowed into the foreign exchange markets to make the U.S. dollar relatively more or less valuable and, therefore, U.S. exports more or less expensive in world markets.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Yes. Limit the base amount in a CBDC account that could earn interest. For example, interest might be earned on only the first \$10,000 in the account so that additional money beyond the first \$10,000 would earn no interest. This base amount, along with the interest rate paid on savings in each CBDC account, could be adjusted according to the prevailing economic conditions to give the Federal Reserve a new policy tool. There could even be a limit on how much additional money could be added to an individual's CBDC account each year just as individual retirement accounts (IRAs) limit the amount of earned income that can be added to such accounts each year.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Access to the identity of CBDC account holders should be restricted. However, the information in the accounts, without the identity of the account holder included, should be readily available to government law enforcement. When law enforcement notices a potential criminal behavior pattern, they should be required to present the evidence of such criminal behavior before a judge who will rule as to whether the individual's identity is to be revealed to law enforcement.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

The Colonial Pipeline shutdown and the threat of foreign governments or domestic terrorists shutting down digital currency operations is a real possibility. To allow for flexibility in responding to the public's need to be able to tap the value of their CBDC accounts, the post office must be able to serve as an access point for physical access to cash or credit (small loans) in the case of a partial or complete Internet shutdown. The Federal Reserve could take over responsibility and assume the cost of postal banking to avoid burdening taxpayers.

*14. Should a CBDC be legal tender?*

Yes. A CBDC should be in terms of U.S. dollars. It should essentially be a digital currency bank account. Large banks already have such accounts with the Federal Reserve. Private banks create digital currency accounts when they make loans out of money created out of thin air but backed by some portion of overall deposits in our fractional reserve system. A unit of a CBDC would always be equal to one U.S. dollar.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Yes, definitely. It is the most important aspect of creating a CBDC. The stabilization tools currently available to the Federal Reserve operate primarily through the financial markets. Some exceptions were made under TARP and the CARES Act, but the Fed does not currently possess a tool that directly interfaces with low-income and middle-income Americans who have the highest marginal propensities to consume and, therefore, the most cost-effective impact on consumer demand. To stop inflation without causing a recession requires interfacing directly with consumers who must be discouraged from spending and encouraged to save with the offer of a high interest rate on savings. The traditional approach of raising interest rates in the financial markets just makes it harder for businesses to get the funds to increase supply in the face of excess demand. Cyclical and seasonal businesses who borrow money to operate each year cut back work hours, employment and close outlets in the face of the higher borrowing costs. Poor and middle-class people who are trying to pay off their mortgage are hurt when the cost of borrowing increases. Home ownership is a form of saving so it is counterproductive to make it harder to achieve. It is not necessary to slam on the brakes and trash the economy to stop inflation. A Federal Reserve CBDC digital currency

bank account for every American would enable the Fed to interface directly with the consumer and adjust consumer demand as needed to stabilize prices. It would be much more effective and cost a lot less than the current policy tools that operate primarily through the New York financial markets.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Yes. The first point is obvious, that a CBDC should minimize the interference with the private banking system so limiting the amount (e.g., \$10,000) in the account (as was done in the 1910 Postal Savings Act) or at least the amount that can earn interest makes sense. However, there is another important reason for limiting the amount per user. For policy purposes in controlling consumer demand most effectively and in getting the most bang for the buck in controlling consumer demand, it makes sense to target those with the highest marginal propensities to consume, which are 40 percent of Americans who currently would have difficulty coming up with \$400 in an emergency, instead of targeting wealthy individuals and large wealthy multinational corporations which have a very low marginal propensities to consume, especially within the United States. The large multinationals often use extra money to increase dividends, buy back their stock, or invest in the production facility in another country. These CBDC digital currency accounts should strictly focus on poor and middle-class Americans to effectively control consumer demand within the United States.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

If a CBDC account were created for everyone, then the primary use of intermediaries would be for local, physical access to one's CBDC account when internet access was not readily available for that individual or entity. Otherwise, such CBDC accounts could be accessed directly by any number of devices, such as one's smartphone or computer. For physical access, a logical candidate for intermediary would be the local post office, with the reconstitution of the postal banking system that existed when I was a child, where anyone could go to the post office to cash a check or set up a savings account. That would be ideal. However, politically it may be necessary to include private banks including ATM machines as intermediaries. In that case, the private banks could charge a fee for acting as an intermediary for local, physical access to one's CBDC account. The Federal Reserve would control the return-on-savings CBDC interest rate and the interest rate on CBDC loans (which would be limited to small loans).

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes. This can be achieved by allowing people to access their CBDC account via their local post office. Under the Postal Savings Act of 1910 anyone could go to their neighborhood post office to cash a check or set up a savings account for fifty years from 1911 to 1966. This is very important for two reasons. (1) The United States could be subject to a cybersecurity attack which might disable our digital currency banking system. (2) Poor, disadvantaged, and elderly people are much more likely to feel more comfortable going to their neighborhood post office to access their Federal Reserve bank account than making transactions over the internet or going to a private, for-profit bank.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes. This is very important for gaining acceptance and encouraging the use of the CBDC digital currency accounts. Make it possible for smartphone-to-smartphone CBDC digital currency transfers from one account to another. If someone rakes my leaves, cuts my grass, or shovels my snow, I want to be able to pay him or her immediately with a simple smartphone-to-smartphone transfer. By default, have the Internal Revenue Service (IRS) put each taxpayer's tax return refund into his or her CBDC account. To focus attention and get widespread use of these accounts, initially put \$1,000 into each CBDC account where that \$1,000 could not be withdrawn until after age 70. But any interest on that \$1,000 could be withdrawn and any additional money or interest earned in the individual's CBDC account could be withdrawn at any time. The interest earned in CBDC accounts should be exempt from taxation.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

A digital connection or linkage (miniblockchain) would be created using an algorithm that was unique to each user across all their devices and their Federal Reserve CBDC digital currency account. Ledgers distributed over an extensive blockchain are only needed for unsupervised

digital currencies, but not needed for a CBDC under the authority of the Federal Reserve. When a CBDC digital currency account is set up, the account holder must identify and register the devices that they will use to access the account. Transactions would be verified both with device identification and a user-selected password as well as fingerprint and/or face or eye/iris recognition using their device's camera. In addition, for each transaction there would be a 60-digit alphanumeric security code generated by an algorithm for that account at the Federal Reserve. After each transaction, the 60-digit security code would change on all the user's devices as well as in the corresponding Federal Reserve account so that no 60-digit security code would be used more than once. A linkage across all the account holder's devices (smartphone, laptop computer, desktop computer, etc.) would record each verified transaction in sync with their Federal Reserve CBDC digital currency account. The user would not need to know about the 60-digit codes as they would all be transmitted in the background and not shown. This would be in addition to encrypting all CBDC account communications.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Use a system dynamics model to avoid violating the scientific method in developing a model of the economy that reveals the relationship between the financial economy and the real economy and how Federal Reserve policies influence these two economies. Too often economists run dynamic stochastic general equilibrium (DSGE) models to see how they fit the data and then adjust their models. The problem is that in any sample there are two kinds of relationships. The relationships that we want to identify are the population relationships that show up in sample after sample and avoid the relationships that are unique to that particular sample and do not exist in the population. System dynamic models as available in Vensim and other system dynamics software can first be run as simulations without using sample data to develop the model adequately to avoid violating the scientific method which requires first developing the model to be tested before looking at or using the sample data. On the other hand, artificial intelligence models intentionally violate the scientific method but compensate by using enormous amounts of data and develop the structure of the model using those data. Out-of-sample prediction can be used to determine whether system dynamics models developed using the researcher's knowledge and intuition will perform better or worse than artificial intelligence models developed using enormous amounts of data to search for the structure that might best represent the population relationships.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

In designing policy tools, the benefits must be clearly understood, but those benefits cannot be adequately understood and appreciated without first understanding the fundamental nature of the problem our economy faces both within our own borders and globally. Adam Smith revealed two invisible hands: one, explicitly in the form of competition that resulted in better quality products at lower prices as competitors pursued their own profit maximization; and a second Adam Smith invisible hand, implicitly in the form of oligopolists conspiring with one another to fix prices and restrict supply (e.g., OPEC). But this second invisible hand of market power exists within companies and not just between companies as employees have lost power relative to employers since the decades after World War II when power was shared equally. Today virtually all the economic and political power (lobbyists and "Citizens United" donations) is in the hands of upper management. At least Germany has recognized the need to have rank-and-file employees represented on corporate boards. The result of all this power and inadequate competition is a distorted money flow which makes the Federal Reserve's job much more difficult requiring more nuanced and targeted policy tools. The problem is that the United States economy has broken into two separate and distinct parts. One part inhabited by wealthy millionaires is focused on Wall Street, while the other part consists of the people on Main Street who have relatively very little money but play a major role in both production and consumption. I came to realize this when I discovered that I had gotten a 7,000 percent return on some Adobe stock that I had purchased back in the 1990s. I did nothing to help the company, but I got a tremendous amount of money, most of which should have gone to the employees, but was instead given to me as a shareholder. The idea that I should be rewarded for taking a "big" risk is bogus since I could easily afford to lose that money. When Marie-Antoinette has more cake than she can possibly eat, offering a little cake to the peasants hardly seems like much of a sacrifice. By concentrating economic and political power in the hands of the upper management of our largest companies who are focused on maximizing shareholder value, we have created a distorted money flow that makes it much harder for the Federal Reserve to do its job of maintaining stable prices and full employment.

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*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Reparations for Stolen Cryptocurrency: Independently of any other CBDC plan, I think the U.S. government should work to issue a cryptocurrency to provide restitution to victims of theft, ransom, blackmail, and comparable major crimes, in those cases where the stolen cryptocurrency remains publicly visible and potentially subject to embargo. I'll suggest a "ReparationCoin" would remain formally a fiat currency, with its value based on "proof-of-theft" and the potential for future restitution. Its value might well fall short of an actual dollar, but it would express the intent that the value one day reaches that dollar. For example, a recent report described the theft of \$600 million from Axie by what may be a sanctioned nation. The current status quo assumes they have simply lost the money. But the whole world sees the currency is "there" in a blockchain ledger, and belongs to the company, and common sense should tell us that they have a right to make use of its value. The U.S. could already plausibly threaten to prosecute any exchange dealing further in the stolen currency, or "mixing" the stolen currency, or dealing in the "mixed" coins if they come to market. However, the Federal Reserve can also ensure here that there is a \*compensatory\* action available -- the victims could request that they be issued ReparationCoins with a face value equal to the provable value of the cryptocurrency in the ledger. Realizing the full value of the ReparationCoin later on is the hard part. Distastefully, the US might find a way to recruit or negotiate with the thieves, or their government. More desirably, the U.S. might hack the hackers to recover the key, or negotiate with those processing the cryptocurrency to persuade them to alter their ledger in a way ordinarily forbidden by their rules. Issuing ReparationCoin could, and probably should, be tied to an insurance mechanism. Today a company that is robbed can go it alone and hope that law enforcement will hand back their coins. But ReparationCoin could exchange all confiscated coins equitably among all registered holders as they are obtained (rather than to one specific victim), until all outstanding ReparationCoins have been paid off at dollar value. In this way, persons whose large stolen holdings of another cryptocurrency have been replaced by ReparationCoin might reasonably expect to see a steady return of those assets to equal dollar values of "harder" cryptocurrencies or cash. Provided that this process is ongoing and reliable, the perception should take root that a ReparationCoin really is worth about the same as its face value. The desired outcome is that immediately after a cryptocurrency theft, people who are robbed will report the crime, obtain ReparationCoins, and be able to spend them with relatively little loss. There are limits to the scenarios in which ReparationCoins could be issued. A small ransom paid to an individual in a non-sanctioned country may be harder to track than a large theft by a sanctioned state. The ransom would at least need to be reported to police in advance of payment, so that the ransomed coins can be tracked and exchanges warned from doing business with them. The prohibition on commerce with these coins needs to be strong enough to ensure that ReparationCoins are not issued for spent currency the government is realistically unable or unwilling to recover. One means to increase the specificity and reach of such a scheme would be to collaborate internationally, requiring sign-offs of multiple countries to issue ReparationCoins and redeem them all as a single pool.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

4. *How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

CBDC could allow a monetary policy of direct assistance or loans into the hands of every American during pandemics and recessions, as opposed to the remarkably unjust and destructive structure of the Paycheck Protection Program

5. *How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

6. *Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

7. *What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

The CBDC should focus on relatively small sums per person. You can use it to make sure every poor person has a basic bank account like mechanism available to them. You can use it to issue thousand-dollar checks during a pandemic or unemployment benefits during a recession without so much of the money being stolen. You can offer small loans that transform the lives of students and homeless people, without worrying very much about timely repayment. Let the banks focus on people who have to (and can) prove how much their collateral is worth and what their yearly income is. And let the check-cashers and payday lenders howl in rage -- they've dragged down the reputation of your industry too long, and nothing would be better than making sure everyone can do without them.

8. *If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

We have no desire whatever to give up cash. We also know that cash is largely a fiction already - the bills are trackable serial numbers little different from a CBDC except in form, often cross-indexed with facial recognition and many other sorts of tracking. Despite that knowledge, those capabilities stay unobtrusive, and the public loves cash because it does not intrude itself into the transaction. It is an object, Legal Tender for All Debts Public And Private, usable anywhere by anyone regardless of credit history or any objectionable statements they once made on Twitter. Cash is worth preserving - and it is also an example worth following very closely.

9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

If a CBDC is worth a dollar, then by definition anyone can exchange it for an actual cash dollar. That dollar can then be used with such anonymity as it is said to offer.

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

14. *Should a CBDC be legal tender?*

From a layman's point of view it is very hard to see how any "currency" would not be legal tender. If you can exchange it for dollars, and dollars are legal tender, then it should be also. If the CBDC decides it doesn't want to pay for disfavored internet content (or any other exclusion), then it becomes a payment expedient, like a credit card, to be used only when

absolutely necessary, but never to be trusted. That's not a "currency" the way the euro or ruble is.

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

*Industry*

*Country*

United States of America

*State*

Texas

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

I see absolutely NO benefits from having the CBDC get their hands on our accounts. We need to stop this insanity!

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

*13. How could a CBDC be designed to foster operational and cyber resiliency? What*

*operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

---

*Name or Organization*

Timothy

*Industry*

Individual

*Country*

United States of America

*State*

New York

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

It jeopardizes the supremacy of the dollar and also usurps Treasury and Congress's role. It is a solution in search of a problem. The dollar works just fine. If we want something more, a direct Treasury note could solve it. Perhaps like the old silver certificates.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes. Fed Now direct exchanges with commercial banks and perhaps even international settlements at the bank level with BIS or with a counterparty nation state might make sense via a CBDC. There is zero need at the consumer level and much risk for mischief. Even if not intended by central banks now, consider how it could be abused with by unfriendly government.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Yes it could. I like cash. The homeless people I give money to like cash. The garage sales stop by like cash. The lemonade stand that children set up like cash. A CBDC is a net negative for inclusion.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

It would be instant and there would be little leakage. That certainly makes policy implementation more speedy, but please consider at what cost.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

In my humble opinion, centralization leads to fragility. Assume an EMP or a quantum computer hack, or a nuclear weapon. One large event could basically wreak havoc on the United States' entire monetary system. Right now, cash and bonds and commercial money, etc. have some play in the joints. Any one event is unlikely to result in monetary anarchy.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

I don't know.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

I don't know.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes. Cash is useful. Cash doesn't require electricity or a telephone.

9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Commercial innovation like credit cards, venmo, paypal, defi, etc. You needn't solve this problem. The market is doing so just fine.

10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Don't bow to peer pressure here. The dollar is still king. Tweaking the dollar could jeopardize it. I believe that other nations switching to a CBDC jeopardizes dollar supremacy. It doesn't strengthen the case for a digital dollar.

11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Do not pursue it.

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

I suppose you could have a CBDC peg. Like 1 FedCBDC is equal to one ounce of silver, like the old silver certificates. To redeem, you bring to a bank branch. Amounts exceeding 100 oz, must fill out some form.

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

I worry about this and think that having physical money is a good way to go. Consider a peg to precious metals, and make it convertible?

14. *Should a CBDC be legal tender?*

No.

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

No.

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Maybe.

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Commercial banks, perhaps.

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes. Make them convertible to precious metals and vice versa.

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

I like cash and commercial bank money. I'm not sure that a CBDC should directly compete there. Best way may be to have a parallel system to fed notes like the old silver certificates.

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Old school is best. 100 CBDCs to the oz of silver or 5,000 to the oz of gold.

21. *How might future technological innovations affect design and policy choices related to CBDC?*

I don't know.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Be very careful here. You're flirting with opening Pandora's box.

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*Name or Organization*

Chitose Nakamoto (pen name)

*Industry*

Individual

*Country*

United States of America

*State*

Minnesota

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes, rather than issuing an entirely centralized digital currency, the US Federal Reserve ought to consider taking an approach to digital currency similar to the one it currently uses for its fiat money—that is, one that is collaborative with the private sector. The Federal Reserve currently allows banks to effectively issue legal tender. By being so focused on the idea of a Central Bank Digital Currency, the US Fed is ultimately limiting the scope and resilience of America's future digital currency. The full nature of the alternative proposal is not able to fit in this comment, so I refer you to the full white paper of the Digital Universal Drachma (as published on the Internet Archive and Hackernoon).

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

As previously mentioned, if the digital currency the US Federal Reserve decides on is strictly in control of the central bank, the financial sector would be left in a place of limbo. If banks create legal digital money, and the central bank does the same, this will result in effectively recreating the economic disunity that existed before the Coinage Act of 1792. Banks currently use digital currency through account balances of broad money backed by a ratio of narrow fiat money—that is, M0 and M1/M2 money have distinct forms and functions. The introduction of a CBDC would make M0 currency to have the same form and enable the same functional advantages of current M1/M2 money. Thus, currency created by the financial sector would be at risk of being perceived as far less valuable since its guarantee of value is less strict, its ease of use for everyday transactions the same, and its convertibility less than that of a CBDC. This can be avoided, however, by including the financial sector in issuing digital currency to ensure a unified and stable method of transacting. I once again refer to the Digital Universal Drachma white paper for further discussion.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of*

*central bank money that can be used widely for payments?*

Yes, the public must always have easy access to a form of central bank money. As the 2008 financial crisis demonstrated, it is unnervingly likely for the financial sector—and thus the currency they issue—to completely collapse upon itself without government intervention. Thus, it is the responsibility of the central bank to ensure the common person has access to money it guarantees itself to prevent the complete decimation of the lower and middle classes in the event of an economic crisis.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

The most likely scenario is that another global economic power's currency will eventually be phased in to become the new international reserve currency. That means the Bank of International Settlements, foreign debt, even the backing of a nation's fiat currency will all be reliant upon a digital currency from the likes of China to conduct business. International economics is a game of hedging bets on trust in a currency's stability and enabling efficient and cost-effective transferring of assets. Without a digital currency sponsored by the US government, the USD would first lose to other currencies in terms of ease and efficiency, and then in trust as it becomes apparent the American economy refuses to modernize.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Ideally, the decisions of other large economies regarding CBDCs should not at all influence the decision of the United States. We should be the leader in this economic frontier. That being said, decisions by other economies should be engaged with diplomacy to seek a unified digital currency among the nations—with each nation's economic authority able to continue to make economic policies—with the goal of creating a more inclusive and resilient global economy.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Digital currencies should have the trait of auditability, not anonymity. That is, through cryptographic protocols such as hashing, the true identity of a user is made entirely opaque in normal circumstances. However, since transactions are not private, end-to-end encrypted, nor obfuscated through Tor or Monero-like methods, the government would be able to use its extensive computing resources to uncover the identities behind suspicious transactions. A more detailed account of the specifics of this can be found in the Digital Universal Drachma white paper.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

Yes. If a CBDC isn't legal tender, it is just a symbolic gesture of engaging in the crypto economy without actually endorsing the benefits it can bring to society.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

No, a CBDC should be a functional form of transactional currency, not an investment. Investments can already be made in private digital assets; what the economy needs is a government guaranteed transactional digital currency. If the idea is just to offer a flashy new form of bonds, the general public is left out of the digital economy, and the US Fed risks becoming obsolete in daily cryptocurrency usage.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

In a sense, but not a direct quantity cap. Instead, as further explained in the Digital Universal Drachma white paper, the ratio of assets backing the digital currency should be a function of the Herfindahl–Hirschman Index of a given sector that the end user belongs to. Thus, while not punishing competition, it discourages stagnation and inequitable consolidation of wealth.

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes, offline capability is essential to ensuring economic inclusion. As digital currencies are dependent upon verification online to prevent double-spending, the question becomes: how does one prevent double spending when offline? My suggestion is to borrow the concept of endorsement from Directed Acyclic Graphs. In short, a unit of currency's most recent transaction must be verified by a specified number of trusted financial institutions before being spent. That way, a user can store the public key of said institutions offline to verify their endorsements of its ownership, but that unit cannot be further spent until it syncs with the online network and is verified.

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

For a full discussion of other design principles, please see the Digital Universal Drachma white paper. The following, though, are two key concepts to consider: 1) Interpolation-based ownership history rather than traditional blockchain provides substantial benefits when it comes to the size of the ledger. 2) Panmetallism (a further development of bimetallism) would provide trust and stability in the currency's value, just as Hamilton argued when laying the foundations for the American economy.

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*Name or Organization*

Matthew D

*Industry*

Individual

*Country*

United States of America

*State*

Illinois

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

A centralized digital currency controlled by a single private institution that has never been publicly audited? I would rather see Dogecoin take the place of USD.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes, through decentralized efforts which the Fed is barred from participating in.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Well, considering the Federal Reserve's current \*ahem\* "success" in stabilizing prices, I'd say that no one is more unqualified to implement monetary policy in general than the current board at the Fed. If CBDC makes it "easier" for the Fed to accomplish its goals, then it's certainly a horrible idea.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Negative.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Not even slightly. "A form of central bank money" is a misnomer, because USD is no longer technically "money." It's a FIAT currency, and a digitalized, centralized version of that, is the only possible worse system I can imagine than the current one.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

The international digital payment ecosystem would evolve organically. Crazy, right? Can't have that.

*10. How should decisions by other large economy nations to issue CBDCs influence the*

*decision whether the United States should do so?*

They shouldn't.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Don't implement CBDC. I won't use it. How's that?

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Seems to me there is plenty of illicit financial activity happening right now anyway, and most of it is being perpetrated by white-collar criminals who think they're above the law. CBDC would make it easier for them to keep manipulating money.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

NO.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

*Industry*

Bank, Small or Midsize

*Country*

United States of America

*State*

Wyoming

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

I fear our government will politicize the digital currency in the future in order to completely control individuals let alone know everything they purchase and deem what is allowed and how much can be purchased. This country will be just like communist China. Total control by the party in power.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Most people use credit or debit cards for everyday purchases and the current system seems to work. Something may have to be modified for very low income people.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Who knows? Ask China.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

The FED has failed at both goals so far so why would the CBDC be a different outcome.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Neither in my view.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

The government in power could set and direct economic investment ie, central planning vs free enterprise. We saw how central planning failed in Russia.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

You tell me. You have been studying this for sometime

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Swift seems to have worked well for decades.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Let's let them try it first. We can learn from their mistakes.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Unknown to me.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

How? You tell me and everyone else in the USA.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Look how successful the hackers have been stealing crypto's.

*14. Should a CBDC be legal tender?*

If it replaces the dollar, it would have to legal tender.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

If everyone has to use it, they should get interest on it.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Where else would they put excess CBDC?

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Banks must be a significant player in any CBDC scheme. What would do? Go out of business? I want someone local to solve my problems not the FRB.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

You tell me.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Ask China.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

You tell me.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Forget this scheme for government control.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

I am having a hard time seeing any worthwhile benefits given the losing control of my privacy.

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*Name or Organization*

Kyle Steele

*Industry*

Individual

*Country*

United States of America

*State*

North Carolina

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The Federal Reserve are not answerable to the American People and yet hold the power over the currency. That risk needs to be addressed.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes, completely decentralized and no need for trust as it is all in the open and verified.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Yes, it would be negative. If you aren't on the "team", you are not included.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Your goals seem to align with the one percent and taking your cut. Maximum employment at these rates are grease for the rich and not for the enrichment of the American People.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Change from centralized to decentralized and the effect would be positive. As it stands going to centralized based is just painting the same wagon a different color. Cutting out the middleman and making the individual thier own bank would be the ultimate stability. Being able to stake your own assets to raise capital for yourself without begging a bank based on arbitrary made up reasons is all upside.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

As long as it is behind the closed doors of the institution with no auditing of business then there wouldn't be adverse effects for the financial sector. "Trust me bro", right?

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Decentralize it and make it viewable and verifiable by all.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

If everyone is thier own bank, I do not see this as an issue.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Again everyone thier own bank, non issue.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The United States isn't issuing this. The Federal Reserve is. You have shown on multiple occasions how you are not answerable to the United States or the American People.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Yes. Decentralized Access

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

The current system doesn't solve this so I don't see why you care now. You can't be audited. We only see what you report. Organic Hardware NFT tied to a person's wallet would be my answer though.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

The human will always be the weak point. Awareness and training. Maybe actually require financial literacy and security be apart of general education rather than have to wait until we are on our own to figure it out.

*14. Should a CBDC be legal tender?*

This seems a redundant question.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Yes. If I stake my assets to facilitate operations I should get a return. If born a citizen a small amount should be granted and staked at birth to grow. Upon grant of citizenship through any other means you should have to buy into it to stake. If a person is vested in the register they will want to see it prosper.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Should be limited to whatever amount prevents hostile takeover.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

No intermediaries. Full decentralized access

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Would have to have a preload capability that off loaded funds to a secondary address that would essentially tie it up until back online and any transactions would then be verified and sent. A lot like a hold when you use a credit card at a gas pump.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Once again decentralized and this is a non issue as everybody would be on the same register.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Loopring L2 is already solving this. Take notes

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Decentralize it.

*22. Are there additional design principles that should be considered? Are there tradeoffs*

*around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Decentralize it

---

*Name or Organization*

Joseph Polito

*Industry*

Other:

*Country*

Canada

*State*

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

a) In attending presentations to the House and Senate committees related to CBDCs, and reading the submissions of the presenters; in following other experts on CBDCs, I have concluded CBDCs would be a considerable technological improvement to our financial system and the economy. The result would be a progressive trend of improvements to productivity, efficiency, profits, and economic stability. The benefit to the people would be, a higher standard of living, more investment in people and infrastructure etc. and less inequality. b) CBDC's would ensure that Cryptos would not be a threat to the constitutional responsibility and control over money creation, and the efforts to have a stable low inflation economy. Bank Money is convertible to Central Bank Money. There is a real threat that the personal choice of adopting cryptos as money would lead to conversion privileges too as that choice became widespread. And there are many many cryptos to choose from. It would be chaotic

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes. Digital currency could be issued by the Treasury Department instead of by the Fed. New money could then be spent into circulation, as Lincoln's greenbacks were, rather than lent into circulation. The level of personal debt we currently experience is associated with greater risks to recessions and financial crises.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Yes, it could have a positive effect, because it lowers the cost of banking. Numerous objective experts have said the cost savings could be staggering!! Banks should also create means-tested cost free accounts, and costless transactions. The poor should have access to the public utility of banking.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Assuming the first phase of CBDC is a complement to cash, there would be little impact. If CBDC's became popular and banks borrowed them from the Fed to accommodate creditworthy profitable loans, the borrowing rate would give precise control over non-market and short term rates.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

The banks do have the privilege of expanding the amount of credit and thereby the broad money supply, which has been associated with the boom bust cycle. Other fintech and crypto systems could expand credit too – further complicating this historical problem. CBDCs could keep the expansion of the money supply under national sovereign control – which is a stabilizing effect. This could change for the better the historic relationship to credit expansion and contraction caused instability.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial*

*sector differently from stablecoins or other nonbank money?*

In the Risks section there was a reference to potential risks to increasing bank funding expenses, but if banks pay interest on deposits, why would borrowing CBDC at something equivalent to the fed funds rate be any different for banks? Why would it be any different from banks raising money with bonds, preferred shares and common stock? In addition there might be a reduced need for deposit insurance as the volume of CBDC grows. But assuming there was an added cost, then the savers would benefit a modest amount.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

The financial sector should be able to borrow CBDCs if they have more creditworthy profitable loans. Banks should be able to function as they have as careful lenders to the most worthy recipient of loans, helping the most efficient business people make the economy more productive.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Many forms of fintech will be involved to reduce the costs of payments, including using other trusted nations' CBDCs – that would be an unwise development and a type of needless off-shoring of the industry. This would mean a staggering loss of profits, and a loss of the benefits of the enormous cost savings predicted by objective experts.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

American citizens would not benefit from the far less costly payment system, and other nations would fill the gap and earn more revenues as our financial sector lost business. Our financial institutions would want to adopt CBDCs because they would lose business for foreign competition.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

The risk is not having CBDCs. If fintech becomes far more cost efficient, we have to have CBDCs to ensure we maintain constitutional control of the money supply. We can't have private tokens being the money. If consumers choose more than one legal tender, there could be financial and economic chaos. It was not that long ago that banks issued their own bills. We evolved away from that for good reasons.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

The vast majority of money transactions are transparent; we write checks, use credit cards, bank transfers, etc. That private information is protected and regulated and subject to normal legal accountability and due process. A relatively small amount of money is in the form of cash which does provide near anonymity, though each bill has identifiable serial numbers. It should be noted that law enforcers call cash the oxygen of crime. The same level of legal protections should be provided to CBDCs as is provided for our current form of digital money. The same level of accountability by users of the public utility, legal tender, should also be expected.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

That is a growing challenge for CBDCs to share with all levels of industry.

*14. Should a CBDC be legal tender?*

Yes, what else could it be?

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

If it is legal tender, it should be depositable or borrowable for interest. If I deposit cash at a bank, it earns interest. If I borrow money and take it out in cash, it earns interest. CBDCs are digital cash.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

The rules should apply equally to all forms of money.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

The pattern for those whose business is money, is strict regulation and protection of consumers. The payments system of Banks, Savings and Loans, Credit Card providers, etc. has to be regulated and so should any fintech competitors to those systems.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

I understand there are offline capabilities, just as we have gift cards.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes so the fintech industry will compete with traditional financial sector, with much lower costs according to objective experts.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

These are very technical questions, but currently our digital money works across platforms. Fintech will keep it considerably less costly, and CBDCs will maintain the payments made in legal tender, and protect the control of the money supply.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Like computers, Fintech will become progressively more powerful and cost efficient, which benefits customers and the industry financial industry progressively for years to come.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Amongst the highest principles is that the constitutional right of creating money (legal tender) must be preserved. Inflation and deflation can destroy an economy and hence the money supply must be controlled. CBDCs permit private sector innovation in the payments system while preserving that control.

---

*Name or Organization*

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*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

There are no additional "benifits" for a CBDC for the citizens of this country. I can see plenty for a tyrannical government including full power to nationalize/confiscate as deemed appropriate, implantation of social scores and spending limitations. None of these are good for the people.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

No. The only benefit of proposing this idea is to shed light on how bad of an idea it is, and to educate people on this subject matter.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Inclusion's opposite, exclusion comes to mind when we propose such an idea. What if a small cabal of unelected officials decide they want to include only certain caste of person, or a group of people based on some sort of social score? There are no net positives for the people, only tyrants.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Like all other forms of monetary control, it will not assist in these ends. In fact, it would likely make things worse, just as quantitative easing has not assisted in these areas either. For example, the most recent round of QE, as well as the repo markets back in 2019 have proceeded the largest spike in inflation since the 80s. Its amusing to think that giving you guys MORE power will give is ANYTHING but the same results.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

No. No currency or policy enacted by the central bank will affect financial stability for the better, in the long term. One only needs to look at the destruction of the purchasing power for the US dollar over the past 100 years to understand this point.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Yes. CBDC would be controlled by a small number of stakeholders, leading our managed economy ( see QE etc) to become more managed. Leave markets alone.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Quit meddling with the financial system. Stop bailing out financial institutions. The only tools that your organization has is the ability to print money via QE - stop using those tools.

8. *If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

No. your form of central bank money has proven itself to be unreliable since your establishment in 1913

9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

No. It seems foolish to follow the decisions of other large economies, including China who already utilize a social credit system to restrict freedom.

11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Send every single coder home and stop developing a CBDC.

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Not possible. This is a complete betrayal of the original design patterns of the first crypto currency.

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Do your own research.

14. *Should a CBDC be legal tender?*

Not a chance. This proposal for legal tender goes against everything our founding fathers thought about central banking organizations. I will fight any movement to make something like a CBDC legal tender.

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

no

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

This proves my previous point, namely the restrictions you would impose on people. You guys didn't even try to beta test this thing before proposing the idea of limits.

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

None.

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

I have to appreciate your attempts at mining for information from the larger crypto community here. a CBDC should be offline...for all time.

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

No. Make the barrier to entry as high as possible so that the people who unaware of your true intentions can not use it.

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Do your own homework.

21. *How might future technological innovations affect design and policy choices related to*

CBDC?

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

This technology was designed with the sole intent of providing the people with an alternative to the central banking system. The only other additional design that should be considered is to not design it in the first place. Without coercion, no one with half a mind would use this product.

---

*Name or Organization*

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*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Well, the federal reserve is a private corporation that regularly chooses to help its member parties over the common good of the people who uses its currency, so I don't see how this would be any different, and in fact be more of a liability seeing as there would be not physical asset, and hence with losing faith with the public, asking them to switch over to a digital currency, being even less tangible, it would seem hard to get the citizenry to believe it wasn't even less of value.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Seeing as there are already more established cryptocurrencies, that already have a user base, a continual growth, and a history of increasing in value, it would be hard to see why anyone would want to switch to a system that already ruined the currency it was responsible of in the first place. How would you convince people to switch, when there is already a alternative in place that already has a better track record, and isn't controlled by government? Why would anyone switch?

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Seeing as the userbase has already been disenfranchised by mismanagement of the one currency the federal reserve is responsible of, shouldn't it work on propping up people's opinion and the security of it, instead of giving credence to the idea that it is so weakened it needs a new one? And if that is the statement, why would individuals trust that the federal reserve could handle management of two currencies, or one new one, when the policies currently governing the one already in existence has been placed in such a position of weakness?

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Many might take it as a admittance it does not have control over the current fiscal situation, pushing individuals to seek to find other safe havens to place their assets like foreign currencies or already decentralized cryptocurrencies.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Based on a rising distrust in the federal reserve, and the recent negative news articles that have risen over the last two years, it might come off as a wave of desperation.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Yes, it seems it would cause more avenues for a mistrust in a private entity, the federal reserve, being perceived as a overreach in privacy, with additional ways to track citizens, hence once again driving them away from the official currency.

7. *What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

How about don't do it?

8. *If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes. With already a disproportionate amount of people without accounts or access to services, if further cut off from a currency, what would the overall cost be of the resultant action. Such examples as those who are homeless, or those who unfamiliar or unwilling to migrate to technology.

9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

There are already several more attractive currencies. You'd spend several times the amount in marketing trying to convince people to switch over to a centralized currency, with one of the main marketing points for cryptocurrencies at the moment being decentralization. A marketing hurdle I'm unsure how the federal reserve would overcome.

10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

It shouldn't. Instead it should focus on boosting the world's opinion of its current currency, bolstering world view by running the federal reserve as less as a lackey scheme for private banks that have already displayed a negligent record of financial negligence.

11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

I'm sure.

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Banks already facilitate such, as does much of other components of our current system, and one of the reasons why it would be a hard sell to individuals to choose any digital currency put out by the federal reserve, because what would the selling point be when it is actively attempting to make a less secure, more moderated product compared to its peers?

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Yet another reason why not to make the switch. In the ever evolving technology space, the amount of trust people would need to feel in order to switch to this currency seems nigh insurmountable.

14. *Should a CBDC be legal tender?*

No.

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

No.

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Yes. As should it be with regular currency, actually now that you mention it.

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

No intermediaries should exist, once again showing that you are a step behind.

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes. Otherwise what good is a conditional currency?

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

It should be printed out on physical, tangible assets, perhaps, as paper?

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

How much money would it cost to switch over to such a system? And would the new access points of attack be worth the vulnerabilities?

*21. How might future technological innovations affect design and policy choices related to CBDC?*

This is a ridiculous question, much like asking a five year old to draw what their favorite superhero's outfit would look like if they shit their pants and needed to go home and change.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Yes, see above.

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*Name or Organization*

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*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The Federal Reserve unfortunately cannot be trusted to issue currency as they are unwilling to submit them to public audit. The federal reserve is not affiliated with the US government and is controlled by major investment banks whom generally make money by illicit financial transactions that are detrimental to the American Dream. Such as rampant naked short selling and running unregulated dark pools. The federal reserve should be abolished and all US currency should be handled by the Treasury which is a regulated entity.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

There are already digital currencies available to this day on public blockchains - I fail to see the advantage of a privately owned (fed) digital coin. Whom is not subject to regulatory controls. If there's desire to use digital coins as currency we can simply leverage the existing crypto space. The Fed has no place in digital coins.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

A CBDC will have the negative affect of financial exclusion not inclusion as the central entities have abused their powers of currency printing to devalue the dollar and drive large populations into poverty. They additionally could control whom can transact and who cannot transact.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

The Federal Reserve Mandate is never followed anyways so the question is irrelevant. Inflation has been growing at an unprecedeted rate for the last 1 year and its directly related to the massive currency printing the federal reserve has done. Unfortunately they have lost all trust and cannot be trusted any further with any matters in regards to monetary policy. Again the federal reserve is owned by banks whom deal with risky derivatives and bet the entire financial security of the US on their risky bets until they need a bailout. Which was done by the fed in 2020 when they provided trillions of dollars in repo loans for failing banks in secret

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of*

*central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

---

*Name or Organization*

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*Industry*

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*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

There should be no discussion of a CBDC before a thorough audit of the federal reserve is completed. Why should a private entity control the finances and economy of an entire nation with virtually no oversight?

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

It already has been achieved. Decentralized finance does everything a CBDC can do while protecting the rights, and voice, of the common people.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

The net effect will be negative. Why should a private entity have the authority to put quantity or time limits on the amount of currency a human person is allowed to possess?

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Arguably, by printing 80% of the amount of currency in the past two years and then blaming it on Russia after the fact, while doing nothing to stop rampant inflation, the Federal Reserve is already failing in its goals.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

The net effect will be negative.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

A CBDC is a dangerous step on a slippery slope to infringing even further on people's rights. Stable coins or non bank money provide people with security, privacy, and agency.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Decentralized finance does this. Which, incidentally, is antithetical to a CBDC.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

We already have this with electronic banking, app payment, etc. there is no need whatsoever for a CBDC.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Via decentralized finance.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

No nation should issue a CBDC.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

By utilizing decentralized finance.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

It can't.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Using zero knowledge roll ups built on top of a blockchain with existing superior security. Such a solution already exists, it's called Loopring.

*14. Should a CBDC be legal tender?*

No. It shouldn't exist.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

No. It shouldn't exist.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Absolutely not. This is completely unethical.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

A CBDC should not exist.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

A CBDC should not exist.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

A CBDC should not exist,

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

A CBDC should not exist.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

A CBDC should not exist.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

A CBDC should not exist.

---

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*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

How will the American citizens keep track of what you do with this? we have had to bail out banks before because of callousness. this seems to give more lee way into bad happenings. it should not be done

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

this should not be implemented

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

CBDC is a bad idea

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

it would give the ability to create infinite amounts of this without being held accountable for the bill the tax payers will have to pay

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

inflation would go through the roof.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

no without being abused the current system is fine.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not*

*raised in this paper?*

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

14. *Should a CBDC be legal tender?*

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

CBDC is a bad idea

---

*Name or Organization*

joe walde

*Industry*

Individual

*Country*

United States of America

*State*

California

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

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CBDC is a bad idea

---

*Name or Organization*

Maria Rivero, MD

*Industry*

Individual

*Country*

United States of America

*State*

California

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

NO PRIVACY LEAVE CASH ALONE

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

LEAVE THIS ALONE IT WILL DESTROY PRIVACY

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

NEGATIVE MORE MINORITIES DEPEND ON CASH. I AM LATINA AND SEE THIS WITH MY FRIENDS AND FAMILY> LEAVE CASH ALONE> LEAVE US OUR PRIVACY> THIS IS A TERRIBLE IDEA

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

IT WON'T AT ALL. The free market is more efficiency

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

IT WON'T at all.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

WILL AFFECT THE POOR AND MINORITIES VERY NEGATIVELY

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

LET US KEEP OUR CASH!

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

This should be left up to the free market without manipulation by central planners

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

This should be left up to the free market without manipulation by central planners

11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

This should be left up to the free market without manipulation by central planners. Risks are better managed by free market than FED and other central planners

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

CBDCs can obliterate privacy they should NOT be adopted

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Don't use it less us keep our cash

14. *Should a CBDC be legal tender?*

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

I disagree with CBDCs don't adopt them!

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Do not adopt CBDCs leave cash alone and allow free market to function

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Don't adopt CBDCs!!!!

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Don't adopt CBDCs they are a huge mistake

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Don't adopt CBDCs they are a huge mistake

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Don't adopt CBDCs leave cash alone leave privacy alone

21. *How might future technological innovations affect design and policy choices related to CBDC?*

Don't adopt CBDCs they are a huge mistake

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Don't adopt CBDCs they are a huge mistake

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*Name or Organization*

Lslyo Metodiev Metodiev

*Industry*

Trade Organization

*Country*

Bulgaria

*State*

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Turgoviq sus stoki styoitelstvo na zgradi,turgoviq sus stroitelni materialo,intirioren dizain, turgoviq sus mebeli,obzavejdane,turgogoviq na imoti oddavanena nedvijimi imoti,vsichk in deinost in, koito nesa,zabraneni sus zakona"

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Nqkoi mogat nqkoi ne mogatne ,

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Nemislq che shte e negativa namesatan

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Ne vsichki sa 3dnakvi

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Ne

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Kogato nee stabelns,

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Mojebi

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Nemislq che shte e nqkakuv problem

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Da

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?

Ne

12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?

Ne znam

13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?

Ne

14. Should a CBDC be legal tender?

Ne

15. Should a CBDC pay interest? If so, why and how? If not, why not?

Zashto to e ne,ne

16. Should the amount of CBDC held by a single end-user be subject to quantity limits?

Ne

17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?

Da torqnva dasa kombini

18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?

Ne mislqnq

19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?

Ne moje da namalee ,

20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?

Ne ne mislq

21. How might future technological innovations affect design and policy choices related to CBDC?

Nie horata nqmame granica

22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?

Da vinagi trqbva daima

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*Name or Organization*

D. Bruce Woll

*Industry*

Consumer Interest Group

*Country*

United States of America

*State*

Illinois

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Any plan to implement CBDC by the Fed must start by recognizing that government has lost control of finance as a whole to private institutions even as the financial sector proper has swollen in size and now feeds on the public resources of society and the earth. Decades of runaway wealth concentration in fewer and fewer hands has been accompanied by a parallel exponential decrease in transparency and public understanding of the most basic principles of money and finance. The failures of government to take back public control of finance in the face of this nakedly destructive course of events demands a public conversation about finance as a whole. CBDC offers a perfect occasion for such a conversation. As Saule Omarova has shown in her article on The Public Ledger, CBDC could cut the Gordian knot of financial technological obfuscation and make technology, for once, a tool to bring public transparency to finance, and therefore public control. But, as she also shows, this requires that CBDC be implemented as part of a comprehensive understanding of the whole body of finance, from its banking core to its latest technological fringes. That, in turn, as Omarova also makes clear, requires, unequivocally, “the issuance of general-purpose CBDC (the ‘digital dollar’) and concurrent migration of all transaction deposit accounts from private banks to the Federal Reserve.” “Central bank accounts [would] fully replace – rather than uneasily coexist with – private bank deposits” (p. 1257, cf. 1265 “full migration of demand deposits onto the Feds balance sheet,” and 1299 “eliminating private banks’ deposit-taking function”).

More generally, Omarova has explicitly based her specific policy recommendations on a “franchise” model of finance as a whole. The value of this model is that it represents an attempt to comprehend all of finance as it has exploded in the last half century under a working sense of the role of the parts. Whether or not this is the most useful design, and whether her specific proposals are adopted, they can be judged in terms of their interrelationships and interacting potential consequences. Alternative ideas need to be similarly placed within some satisfactory alternative context. Answering the individual questions regarding CBDC listed in the request for comment, in the absence of a discussion of overall design principles feels inadequate.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve’s ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

7. *What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*
8. *If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*
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22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

Marc Ward,

*Industry*

Bank, Large (\$90 Billion or More in Assets)

*Country*

United States of America

*State*

California

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The risk of liability money is it is a liability of the issuer. If the issuer unconstitutional, then the liability of the issuer is illegal and void. The risk is the Federal Reserve District Banks subvert the US Constitution by enabling Congress to borrow and emit Bills of Credit. Liability Money is a Bill of Credit, a promise for a promise.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

There will be no benefits of a CBDC, only costs and death.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

What is “financial inclusion.” The Federal Reserve is owned by its member banks. There is no way for a citizen to acquire ownership of the Federal Reserve... that is extremely exclusive. How is it possible that a federally chartered corporation is so exclusive they claim to want inclusion? No, the Federal Reserve just wants everyone to desire it’s liabilities. Illogical.

*4. How might a U.S. CBDC affect the Federal Reserve’s ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Those goals were never delegated to Congress to set. “Maximum employment” requires everyone working for liabilities. “Price-stability” can only be achieved with fake future price announcements to trick the individuals to give up their energy for debt. If prices are increasing at an increasing rate (% growth) how is that stable??? Crazy wrong math.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

CBDC would only pursue financial control.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

The Federal Reserve subverts the US Constitution by enabling Congress to borrow and emit bills of credit.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Destroy the Federal Reserve District Banks and use electronic claims for vaulted Dollars of Silver and Dollars of Gold as medium for exchange.

*8. If cash usage declines, is it important to preserve the general public’s access to a form of central bank money that can be used widely for payments?*

Central bank money is not money but debt and is not legal but illegal and void given the 14th

Amendment Section 4. Given the active subversion and violence, "all such debts, obligations and claims shall be held illegal and void."

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

They already occur, thank you Bitcoin and Litecoin.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Congress can only regulate the "Value" of "Money." Congress cannot define what is "Money." Since the States can only make gold and silver coin a tender in payment of debt, the Constitution directly implies only gold and silver coin are money. This is confirmed by SCOTUS in *Bronson v Rodes*... "this court recognizes the fact, accepted by all men throughout the world, that value is inherent in the precious metals, that gold and silver are in themselves value" and the only proper measures of value based on weight and purity. If no value then it is not Money.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Yes, Destroy the Federal Reserve and then the Bank for International Settlement.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

The Federal Reserve is illicit financial activity designed to enslave the minds of the population.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

The CBDC being unconstitutional is the great risk.

*14. Should a CBDC be legal tender?*

Question: Take the limit as time goes to zero, how many promises can acquire energy?  
Answer: the limit does not exist! Never exchange your finite energy for an unlimited promise.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

No, interest growth is exponential growth and that requires an infinite number of units.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

This is crazy. Limit the end user but not the issuer??

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Illegal firms.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Never create this unconstitutional currency.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Are the federal reserve district banks Constitutional?

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Are the federal reserve district banks Constitutional?

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Are the federal reserve district banks Constitutional?

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Are the federal reserve district banks Constitutional?

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Technology Company

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

There are a number of potential benefits of retail CBDCs for international payments, monetary policy and financial inclusion. CBDCs could facilitate faster and more efficient cross-border payments. As cross-border payments are more complex than domestic ones, CBDCs would help ease international payments by offering cheaper—lower transaction and storage costs—and more transparent and resilient payment solutions. CBDCs could also increase safety in payment infrastructures, enhance systemic efficiency and offer increased protection against money-laundering processes. The potential financial stability related risks through the introduction of CBDCs arises primarily from a significant substitution away from private money, whereas central bank cash-to-CBDC substitution is generally regarded as having no implication for financial stability. CBDCs (like other forms of digital money) could lead to higher volatility in bank deposits and/or a significant, long-term reduction in the volume of customer bank deposits. This could, under certain circumstances, affect bank profitability, lending and the overall provision of financial services. Customer bank deposit related funding is at the heart of the commercial banking business of maturity transformation and intermediation services. Any material loss in customer deposit funding would require banks to consider additional initiatives to maintain regulatory ratios and risk-adjusted profitability.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

CBDCs have arisen on the back of significant advancements in enabling technologies in recent years. It is crucial for the banking sector to now “catch-up” with the internet era and provide faster, cheaper and programmable payments for everyone everywhere. CBDC is by far the most advanced form of money and currently the best approach to achieve this. All other current forms of money have not been able to provide the potential benefits that CBDC offers.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Due primarily to its architecture, CBDC is able to support offline payments, shielded transfers, automation throughout the programmability layer, and possess cash-like properties. All of these features when taken together will improve financial inclusion of the user by providing them with a digital alternative to cash, the possibility to access their money even in remote areas, and also provide options for those that are currently unbanked.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

The introduction of a U.S. CBDC would have a wide range of potential benefits but also some risks, which is common with the introduction of any new technologies. However, a careful and measured implementation protocol can address many of these risk considerations and would benefit the Federal Reserve in its ability to effectively implement monetary policies and stability goals. Careful implementation and considerations for risk contingencies along with optimal utilization of new and available technologies would go a long way in maintaining price-stability and generate maximum-employment.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

The overall net effect would be positive for financial stability. The surge of various cryptocurrencies have brought various risks along with them. For instance, cryptocurrency volatility impacts financial markets and hence stability making it harder for central banks to fulfill its monetary and financial stability mandate. The successful introduction of a CBDC will address the need in the marketplace for a reliable and trusted form of money that also enhances the operation and resilience of the financial system as a whole (particularly in payment services). Careful CBDC design and implementation programs coupled with sufficient time for existing financial systems to adjust and adapt plus additional flexibility to apply safeguards would enable a smooth introduction and adoption of CBDC and contribute to financial stability. Central bank cash-to-CBDC substitution is generally regarded as having no financial stability related risks. The one potential financial stability related risk from the introduction of CBDC arises primarily from a significant substitution effect from private money. This is why a thoughtful and measured roll-out and introduction program is essential.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

As long as CBDC is managed correctly and doesn't immediately and abruptly disintermediate commercial banks, a CBDC is unlikely to negatively impact the financial sector. Adopting a CBDC will have positive benefits and will offer greater security, in addition to providing faster, cheaper and a more efficient method of payment versus stablecoins and other forms of non-bank money.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

The tools to mitigate any adverse impact of CBDC on the financial sector, including the ability to stabilize the financial sector, would be: modifiable remuneration on held CBDCs, quantity ceiling for the amount of CBDCs held at any one time and limited convertibility to different types of assets.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

CBDC are unlikely to fully replace cash but rather serve as a supplement to cash. This would create an ecosystem where both cash and CBDC would co-exist. This however, would reduce the absolute volume and usage of cash but not drastically from a general public's point of view and would be supplemented by CBDC, further creating opportunities for innovation. Offline and cross-border transfer facilities of CBDC would make it easier to use and provide further access of central bank money to the general public. However, this would also help a central bank to manage the cash flow within the financial market by streamlining and easier process implementation for the cash flow market since there would be CBDC to cover for any blocker that arises during any such implementation.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Cross-border payments require a double-ended solution. If the necessary technology is not yet functional in the United States due to absence of a U.S. CBDC, the status quo of legacy systems will remain the only usable option. This is costly not only for the sender and recipient, but also to the economy. This lag slows the entire pace of international commerce, causing ripple effects throughout the process, impacting businesses and the economy. The desired outcome is one in which users can send money anywhere in the world instantly through a safe, secure, and convenient ecosystem. This can be accomplished with the implementation of U.S. CBDC. Customer expectations are shifting rapidly as consumer habits change and the access to new technologies become available. Individuals and corporations alike have grown accustomed to the ease and convenience of holding an entire banking ecosystem in their hands, enabling them to complete various financial transactions with the push of a button. As such, it is not unreasonable that they also demand the same functionality for international remittances. Improved cross-border payment capabilities can also help businesses and the economy grow by expanding their scale, while decreasing costs associated with transaction fees and exchange rates. Fortunately, it doesn't have to be an 'either/or' proposition. While various large economies are working towards building their own CBDC, leveraging Fluency's already existing CBDC solution can help the U.S. Federal System to keep up with the inevitable changes.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The United States should always be on watch as to how other large economies are implementing CBDC and should spearhead the implementation of a U.S. CBDC. Since CBDCs will offer an expansive platform for innovation and enhance the ease of use of central bank money, it will also preserve key decision making capabilities within the federal government, unlike the current suite of cryptocurrencies. It would also ensure a safe and smooth implementation of a new financial system that would also help the U.S. maintain its status as the financial cornerstone of the world and leadership position of the next phase in the advancement of the world's financial ecosystem. Appropriate risk mitigation techniques along with careful design and implementation of U.S. CBDC should always be the end goal for the U.S. federal government irrespective of what other large economies decide on implementation of CBDC, in order to remain ahead of the curve.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

The potential for the introduction of a CBDC to affect financial stability risks arises primarily from a significant substitution effect from private money. Any material loss in customer bank deposit funding would require banks to consider combinations of actions to maintain regulatory ratios and risk-adjusted profitability, e.g.:

- Switching to alternative market-based funding sources which could be more expensive and potentially less reliable
- Reduction in assets/deleveraging
- Increased risk taking to mitigate near-term margin compression
- Increased lending rates
- New products and customer offerings to offset any lost fees and commissions on activities associated with customer deposits, e.g., ancillary payment services. These could include actions that improve competition for customer deposits or leverage a role as CBDC intermediary
- Cost efficiencies (e.g., lower cost of cash handling)

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

CBDC is able to provide privacy to consumers through the implementation of shielded payments at the core level of protocol. CBDC payments would be able to preserve consumers' privacy and keep their data confidential to everyone except the parties directly engaged in a transaction or authority such as the central bank or government. This could be achieved by shielded payments limiting the data carried inside transactions only to the minimal amount of information required for a settlement, encrypt that data using both hardware and software encryption, allow AML procedures and compliance checks to be run only inside secure elements without exposing that information anywhere and the use of verifiable cryptography in order to prove compliance of any transaction without exposing plain data through verifiable claims.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

By designing CBDC around a shared ledger maintained by the commercial sector and according to consensus that was configured by authorities, it is possible to achieve top level resiliency and fault-tolerance of the network. The performance of the network may degrade to some degree as nodes are going offline, but so long as any of the nodes are operational, the network would be functional as a whole. This kind of setup naturally provides replication meaning that data would be safe and secured throughout multiple machines and possibly geographical localizations.

*14. Should a CBDC be legal tender?*

Yes. The financial system will need to be overhauled in order to meet current / future needs and demand for improved payment services. Private digital money poses risks to both users and the financial system, however a CBDC as legal tender would offer citizens broad access to digital money that is free from credit risk and liquidity risk, while providing cheaper, faster payments and supporting future innovation.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

CBDC should be designed in such a way that it is possible to set up any interest rate linked to its holdings and to modify that value by authorities as needed. Remuneration would prevent a situation in which CBDC undermines monetary policy and avoids structural bank disintermediation. It would also allow the Federal Reserve to act in a crisis (e.g. a bank run) by, if needed, lowering the remuneration to a point where it is uneconomic for a consumer to

migrate to CBDC from a bank deposit.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

A possible way to mitigate the issue of excessive stock of CBDCs would be to implement soft-limits with waterfalls to designated accounts. Any payment that would create an overbalance of CBDC holdings relative to a limit set up by network authority would be accepted in order to meet guarantee requirements of the settlement protocol, but would trigger an automatic transfer of the excess from the CBDC account to a designated account which may be an account held within a commercial bank, another intermediary or network consensus itself. Each registered holder of a CBDC account would have to designate such a “waterfall” account, also implying that CBDC users should maintain commercial relationships with intermediaries.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Firms that would serve as intermediaries are those that provide privacy and identity-management frameworks (AML/KYC/CFT), commercial banks and FinTech firms that provide services to issue and manage the CBDC.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

CBDC should have offline capabilities. One of the most prominent features of a CBDC should be to possess cash-like properties when compared to current digital banking systems which are not able to provide such a feature to a full degree. In order to have this functionality in a CBDC it should be designed to be decentralized across certified institutions (intermediaries), rely on a shared core ledger and be implemented on a settlement system in which transactions carry only desired state change without assumption on state before or after, and possess a mechanism to guarantee settlement of any offline transaction.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

CBDC should follow all inclusivity recommendations for implementing any client applications and devices, meaning the use of clean, UI/UX, providing options for people with disabilities, and providing simple flows that are understandable to people regardless of their understanding of the finance/tech world. All technical details and intricacies connected to the innovation should be presented in the most simplified manner possible.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Inter-CBDC and cross-CBDC transfers would be possible solely throughout the CBDC platform, meaning both domestic and cross-border transfers are possible to be implemented seamlessly providing high performance, near-instant finalization time and low costs in the transfer of money. Completing an exchange to other means of payment - for example cash or digital bank stored money or any other non-CBDC protocol would require support from intermediaries that could run such a bridge service in which anyone can exchange CBDC to non-CBDCs and the other way around.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

With many of the world's central banks focusing their efforts towards bringing about CBDC, it is evident that CBDCs are the way of the future. Hence, consumer behavior and new technological innovations will directly or indirectly impact the design choices as well as policy implementation around CBDC. The goal is to create a synergy between technological innovation, design, and policy making which would ideally result in optimal implementation, widespread adoption, and financial stability. Some of the key future innovations that could potentially impact design of CBDC are:

- Future technological choices like the approach for chain monitoring can have impact in design privacy policy in terms of the balance between privacy and transaction monitoring reg AML procedures.
- Strong programmability abilities may impact monetary policy with additional rules (i.e. ability to configure the term of validity of digital assets or similar possibilities).
- Abilities to interoperate with any other digital assets may force the design of different privacy policy rules based on specific digital assets (i.e. different rules for stablecoins, synthetic CBDC or cryptocurrencies).

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential*

### *benefits of a CBDC?*

There are several trade-offs which are being actively discussed through CBDC-focused organizations. 1. Accounts vs Tokens The first debate is whether tokens or accounts are the best settlement structure for implementing CBDCs. Older systems use tokens as it had the most market share in enterprise platforms, but with emergence of specialized CBDCs platforms more and more organizations have concluded that accounts are better suited for the purpose especially when considering the possibility of having programmability, offline and shielded payments, and other desirable features which have proven problematic with tokens.

2. Programmability vs Non-Programmability The second one is whether CBDC should focus simplicity, thus limiting its features to the most basic payments only, or to have programmability options capable of bringing innovation to the financial sector. It's worth mentioning that most of the features that make CBDC unique and enable it to meet requirements allowing it to improve upon the state of digital banking requires a degree of flexibility that comes only from programmability. 3. Cash-like vs Non-cash-like The third trade would be whether CBDCs should have cash-like properties. This is indirectly connected to the previous two mentioned tradeoffs, but ultimately, assuming CBDCs would need programmability, which is achievable within such an environment.

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*Name or Organization*

*Industry*

Merchant

*Country*

United States of America

*State*

Utah

*Email*

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Umm yes is this paper blank with white Cheeze or p1nk and dotted in space spot ffr/rezze flocks??

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*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Umm I think inclusion is best kept in exo-carat deep bends because of the fax on fun and find dings funnel nesting has reserved for late state write ups old tax recoil scatters that we'll never get back so maybe no net is best intent for this incident.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

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We won't have to potentially subject our health care plans to possibilities of dirty money exchanging hand to infectious rodent hand we can safely keep our distance as the focus and not the exchanging act in itself

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Well clearly they should all follow along as we show them the truth about possibilities for there budget planners too.

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---

*Name or Organization*

*Industry*

Academia

*Country*

Canada

*State*

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

In the paper, there's a worry about CBDC competing with private sector payments. That competition could be a good thing. CBDC could discipline the private financial system.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes, by not having CBDC "intermediated." If the central bank is going to issue CBDC, do it directly.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Yes, but having it offered through private financial institutions won't accomplish that. The problem seems to be that private financial institutions are not sufficiently inclusive.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

CBDC presents no problems in this respect.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

This should not be a problem. Traditional central bank crisis intervention works to solve the issue of flight to safety. If depositors are fleeing from the liabilities of solvent but illiquid private financial institutions, the job of the central bank is to lend to those institutions.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

In the paper, there's an idea that we need to make CBDC less useful - by not paying interest on it, or putting caps on holdings of the stuff - to prevent it from competing effectively with private sector means of payment. What a terrible idea!

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

If cash usage declines, that might indicate that central banks need to update their provision of payments mechanisms to the general public, right?

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

That's pretty obvious. It's useful to watch and learn from the effects of experiments in other jurisdictions.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

I'm not sure this is possible. This is the key tradeoff involved. Privacy is an important public good. Privacy also lowers the cost of crime.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

Yes.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Yes. For standard efficiency reasons.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Yes, this might mitigate the issues with criminal activity.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

I don't think CBDC should be intermediated. Bad idea.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes, but no idea how you do it.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

This should be transparent from the user's perspective.

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---

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*Name or Organization*

Shawn Taylor

*Industry*

Individual

*Country*

United States of America

*State*

Virginia

*Email*

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This will give too much power to the government over our money this is a terrible idea

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

no

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

The effect will be negative for inclusion

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

This will infringe upon our right to chose what we do with our money

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

This will give too much power to the government over our money this is a terrible idea

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This will give too much power to the government over our money this is a terrible idea

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

The only thing that will mitigate the adverse impact of the CBDC is to not create it.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

No, this take away democracy

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

There are still regulations set to regulate illegal cross-border transactions

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The US is a pioneer we should not be influenced by other nations especially if it's not in the people's best interest.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

The only thing that will manage potential risks associated with CBDC is to not create it.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

By not issuing the CBDC

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

There is always the potential to have digital information compromised and this is too dangerous to implement. If someone was to exploit the CBDC they will have access to all American citizens.

*14. Should a CBDC be legal tender?*

NO

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

NO

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

NO

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

CBDC should not be implemented

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

CBDC should not be implemented

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

CBDC should not be implemented

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

CBDC should not be implemented

*21. How might future technological innovations affect design and policy choices related to CBDC?*

CBDC should not be implemented

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

CBDC should not be implemented

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*Name or Organization*

*Industry*

Academia

*Country*

United States of America

*State*

Colorado

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Proposal is an unconstitutional intrusion into the persons and papers of individuals.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

The proposal provides no benefit to any private entity.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Any effect would be negative.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

CBDC would result in employment and price instability.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Negative.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Yes ! Both CBDC and 'stablecoin' would adversely impact the financial sector.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Drop the plan to issue any CBDC.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

No !

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Domestic and cross-border digital payments will evolve in accord with free enterprise principles.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Decisions by other large economy nations to issue CBDCs must not influence the decision

whether the United States should do so.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Risks associated with CBDC are unmanageable..

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

CBDC cannot provide privacy to consumers.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

CBDC cannot be designed to foster operational and cyber resiliency.

*14. Should a CBDC be legal tender?*

No !

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

CBDC should never be issued.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

No amount of CBDC should be held by a single end-user.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

No CBDC should be issued by any entitiy.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

No CBDC should ever exist.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

No CBDC should ever exist.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

No CBDC should ever exist.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

No CBDC should ever exist.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

No CBDC should ever exist.

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*Name or Organization*

*Industry*

Individual

*Country*

United States of America

*State*

Maryland

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The risk of "Scams" especially on the elderly still has not been resolved, I fear that this will make matters worse and much more costly to the population by making it easier to run the scams and allow larger amounts to be stolen. A large portion of these monies go abroad and can not be retrieved making it a loss for those that can least afford it. This is one problem that needs to be corrected first.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

A lot of people that tend not to use the banking system don't understand and or don't trust them. These people are usually older or under educated and don't understand the workings of the financial systems that are in use and will be unable to understand the changes. They will need access to their monies by Bank tellers or checks that they receive in order to survive on a regular basis.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

It is very important to keep money flowing as many people keep money on hand for unexpected problems and it also gives people a sense of security to have cash on hand. To limit their cash or ability to get cash could be devastating to them.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the*

*decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

The system in place now is not perfect but has improved over the years, it should not be abandon but should continue to be improved an any changes should be done in small steps as most of us are not affluent or big business peoples. Small changes are best as they allow finding mistakes and adjusting of the system easier.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

*Industry*

Bank, Small or Midsize

*Country*

United States of America

*State*

Oregon

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The ability for compute performance to improve will allow it to scale better with energy consumption negating concerns of environmental impacts. The move to renewable & nuclear energy will allow CBDC infrastructure to meet demand while avoiding an exacerbated carbon footprint, whether that would be 'mining' via supercomputer conducted internally or all other systems needed to access a hypothetical CBDC platform. The primary "gas" costs of current blockchains can almost be negated entirely if operated by the government; this will improve transfer times, validation times, and be an overall improvement over ACH transfers. Additionally, global transfers would theoretically transact with the same speed as domestic transfers (this doesn't include international validation that I would assume to be required for payments entering and leaving the U.S.) If a Proof of Work (PoW) system were to me implemented, the 'miners' could be limited to U.S Banks, nationally or state chartered. That way, it can be another form of decentralization that can increase security and allow banks to have skin in the game. Credits could be given to those that participate, and the more that participate, the more effective and secure the CBDC could operate.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

The primary thing to take into consideration is blockchain technology as a whole. There are over 10,000 different cryptocurrencies that offer a wide array of different features and functions. However, they all operate on the same fundamental blockchain technology of the ever growing 'public ledger'. There is almost infinite possibilities of features and benefits that could be achieved within the blockchain technological space. That is why Bitcoin, Ethereum, and all other major players have increased in popularity; individuals see the potential, but the adoption is lagging because of volatility and uncertainty. However, uncertainty and volatility can be eliminated with a CBDC since it would be backed by the Federal Reserve and give individuals an entry point into the blockchain space.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

A CBDC would greatly increase financial inclusion. The ability for public and private entities to implement ways to hold and move a CBDC is limitless. Linking bank accounts to payment services like healthcare, investment intermediaries etc.; with existing requirements, one would need to be a part of a banking institution. Allowing such easy ways to open a CBDC 'wallet' and start getting transfers whether that would be wages from employment or personal gifts would greatly reduce the 7 million Americans that remain unbanked. A lot of online transfer systems like PayPal, Venmo, CashApp all have proprietary systems, but all operate on top of the banking system. If all operate on the same CBDC system, these secondary transfer systems could work better together and allow even more people to transfer money between businesses and other individuals.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

This would be a slow process in the beginning of the program but has the potential to offer much more insight to steps needed to achieve price stability and maximum employment. As

more individuals use a CBDC, the more data that could be collected and reviewed; this gives the Federal Reserve real-time view of what money is going where and allow the Federal Reserve to better allocate monetary policy. Imagine reviewing meta-data about consumer money transfers and observing that money transfers to grocery has increased more than luxury goods, government spending and aid could be directed to food assistance since it's a growing concern of public spending. Transfer IDs could be flagged by employers using the system as 'wages' so it would show real time wage payments across the CBDC blockchain ledger, and one could extrapolate wage growth/employment growth. This system offers incentives of quicker transfers and an easier time fulfilling reporting requirements at the 'expense' of less privacy regarding money transfers.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Per my response above, the ability to track and analyze real-time data will allow for more informed responses and improve financial stability. The problem is the lag between data generation and analysis. A CBDC reduces this lag. As a CBDC evolves, so do the methods of data collection and analysis so accuracy will improve overtime and insights will closer align to real-world trends.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Yes, a CBDC could affect the financial sector. I see it being a positive long term affect simply because it will open the ability for many people to access new areas of the financial sector. Stable coins do a good job of this, but stable coins are inertly used in the crypto space; since the space is new and complex, there aren't a lot of individuals actively working in the space.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Tools would include ways to generate information for single money transfers. The adverse impacts would be identifying inefficient sectors in the financial space. This would be considered creative destruction in the way that older, outdated institutions will suffer but allow better replacements to thrive. The benefits will greatly outweigh the costs.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes, it is very important. Individuals trust something tangible over something that is intangible, so access to central bank money is crucial. Think of paper backed digital currencies. Protection from physical threats like powerful solar storms that could corrupt electronics are crucial. Additionally, transparency of wealth is an important factor to consider; the data generated from a CBDC should be available and able to be seen & audited by the average consumer. This would prevent issues like a CBDC being issued faster than the real growth of the economy resulting in inflation.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

It would be asymptotic. The global financial system is approaching digital currencies and if the U.S. decides to abandon this, we will be lagging far being the global economy (assuming the global economy adopts CBDC's of their own) and the U.S. will have to scramble to muster something up while early adopters benefit from their respective economic boom. A U.S. CBDC is crucial to the success of the national economy and the payment transfer system, the U.S. will not be able to avoid this transition. Paper is linear, electronics are exponential as information increases traditional transfer systems will get exponentially slower.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

This should not be a question. Question is not whether the U.S. should keep up with the Jones's, but rather an assertion that the U.S. should be the Jones's. I reiterate my point that the global financial system is evolving into this space so it would be behooving the U.S. to accomplish its transition sooner rather than later. If a nation is deciding if it should follow suit based on the decisions of other nations, then that nation is lagging, period. The focus should be innovating the domestic nation over following in the footsteps of others.

*11. Are there additional ways to manage potential risks associated with CBDC that were not*

*raised in this paper?*

Encryption and decentralization are key if one would want to mitigate external risks with a CBDC. Decentralization can be done by allowing multiple separate parties to uphold the blockchain like banking, data centers, state governments; the more nodes a CBDC can establish, the better. Encryption can be achieved with a highest standard for software engineering. Data redundancy helps with internal risks like data corruption, technological glitches, or individual malpractice.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

The same way that banks do. backend regulation helps banks and governments observe what is happening but allows a shield to prevent private information being seen. Data breaches can happen but if everything is encrypted at the highest level, then the leaked data won't provide much use. Encryption is key because it allows the authorized user to access data while preventing pirates from stealing sensitive information.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

The increasing access to biometric authentication and multi-level authentication greatly increases security. these should be implemented without a doubt. The operational cyber risks that cannot be avoidable comes down to human error. This could be a mistake in the creation of CBDC that has an exploitable loophole or having an individual with ill-intent in the wrong position of authority.

*14. Should a CBDC be legal tender?*

Yes, it would act as a 'better dollar', therefore it would act as a legal tender that would coexist with the traditional U.S. dollar.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

A CBDC needs to pay interest. Interest should be paid because it provides economic incentive for participation in a CBDC and will increase adoption rate. It is evident that not a lot of people value time as highly as they should so the immediate benefits of speed using a CBDC may not be enough to convince consumers to adopt a CBDC so interest will help. Without interest, there is little skin-in-the-game for the average user that would make it harder to get people onboard with a CBDC. The best way is to 'stake' or lock CBDC for use that can accrue interest at a market rate the same way deposits in a bank pay interest. These locked funds can follow similar structures to CD's or deposit accounts that have withdrawal requirements. Staking can follow terms of government issued bonds as well and would almost eliminate the need for bonds to be traded on a financial exchange.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

No, for a CBDC to act as an alternative to the traditional U.S. Dollar, one cannot be limited. A CBDC should be thought of as a long-term replacement to the physical dollar. There are no limits to how much dollars one could have under their name so the same standard should hold to a CBDC.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Banks, investment firms, governments, ones that primarily work the holding/distribution of wealth should be the only ones that serve as intermediaries for the CBDC. Most regulatory requirements that banks and other financial institutions are held to with money should equally apply to a CBDC.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

A CBDC should not have long-term offline capabilities. If it acts as a replacement to the dollar, then it can be easily converted so one could take advantage of the 'offline' structure of paper money and 'online' structure of a CBDC. They should be one in the same.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Any account that holds CBDC could have a unique QR code assigned to them as well as a secondary form of authentication like a pin. This would allow most phone users to hold a scannable code that would need to be authenticated with a pin to allow for easy payments at any place. A proxy card that has a chip could be issued in the short-term that is tied to a CBDC account to make use of current infrastructure.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

If the CBDC is tied to the dollar, transferability will not be an issue. Any entity that adopts the infrastructure to support CBDC will be able to accept it from any user since it all relies on the same baseline technology. If an entity would rather rely on traditionally ACH methods, then changing CBDC to USD can be as easy as a button click. If an account holds \$1,000 USD, and a CBDC is pegged to the dollar, then one account could theoretically support payments in CBDC & ACH simultaneously without the need for transfer.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Future technological innovations would need to prioritize speed and efficiency. Migration from one platform to another can be a tedious task but this level of technological expertise would be required to design a CBDC. Policy choices regarding this would be synonymous with the history of ACH innovation. Per my aforementioned idea regarding 'staking' and interest income; one could stake a nominal amount of CBDC and lock in voting rights so if something needs to be changed with a CBDC, every individual that locks X-amount of CBDC gets a vote. This would need to be tied to unique identifiers like SSN to prevent from double voting. This offers an additional layer of participation that would incentivize users to adopt this system.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

The bottom line is as information gets bigger, we need more speed to make use of it; a CBDC greatly increases speed and efficiency when dealing with increasingly complex transaction data; this can be transformed into economic benefits. That is what the focus of a CBDC should be. With the sole focus of speed, the possibilities are limitless.

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*Name or Organization*

*Industry*

Individual

*Country*

United Kingdom of Great Britain and Northern Ireland

*State*

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

I see a huge risk of nefarious actors now or in the future using centrally controlled digital currency to control people. In a free market democracy there is no need for this level of control. In my opinion a CBDC would be closer aligned to the values of communist China than the USA.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Bitcoin. Fixed supply. Immutable ledger.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Negative. One of the biggest factors in expanding the wealth gap is fiat currency and the printing of new money.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

I believe it would be dangerous for democracy.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Stability at the expense of authoritarian control of the nation is not worth it.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

It would negatively affect the free market and democracy as a whole. Innovators and free thinkers may rethink their decision to base themselves in the US

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Bitcoin is the answer to this. A globally trusted immutable payment ledger which fosters global cooperation between not only individuals, but all nations.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Let the free market decide this. Money = information. The distortion of the financial system has already seen crippling impacts on the working & middle classes.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The US should lead the free world into adopting the free-est of all markets. Liberty and defence of individual property rights should be at the forefront of all decisions.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

I don't know the answer to this. But please factor in that taking away people's freedom and privacy is a huge negative. I abhor criminality but freedoms are the bedrock of America.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

If you make one then definitely.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

I don't believe that interest is necessary. I believe the most important thing is a fixed supply. The currency must return to being backed by something tangible. Fiat is leading to the slow decline of society.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

No.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Open source. Transparent. NOT existing banks. Cantillon effect is ruining the world.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

No

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Bitcoin payment rails

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Bitcoin will win in the end anyway. Bitcoin is the open source immutable fixed supply money already chosen by engineers and working class people.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Do NOT limit what people can spend their money on. FREEDOM. OPEN SOURCE. You have a chance to build trust back into the financial system by choosing bitcoin over authoritarian CBDC's.

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*Name or Organization*

*Industry*

Trade Organization

*Country*

United States of America

*State*

Iowa

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The potential for surveillance and locking individuals and specific groups out of the economic

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes we have answer in the crypto community that would eliminate these concerns

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Yes thank he net effect would be negative those that are exclude now will be lost for ever and with the disdain that many has towards the government they would leave the system also are just participate only where forced their by eroding freedom

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

It would give the power to the government to withdraw are credit at will

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Outing so much power in the government hands would allow them to have more power over individual and cooperate accounts it would no longer be capitalism

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

It all depends if n the people involve I would rather it be in the hands

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

No it would make it better make it decentralized and have a limited amount made at the beginning

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

No the public has already created a vibrant industry let's stay American democratic and capitalist

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

The usd will remain dominant has it will be the backing of most stable coins and people will feel safe has the USA will not be a government in every ones account

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

People will flee those currencies for usd and stable coins

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

No it's all predicated on whose in charge no one knows when someone with evil intentions get in charge

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

It would not give privacy to consumers and it would cause more illicit activities

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

This is too much government in control off our money supply

*14. Should a CBDC be legal tender?*

No

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

See this is the issue why should we want the government be able to limit peoples asset

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

Isaac

*Industry*

Individual

*Country*

United States of America

*State*

Wyoming

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

CBDC risks are that it is centralized.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

DeCentralize

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Negative for inclusion

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

The federal reserve does not have the ability to effectively implement monetary policy. Thats why DeCentral currency was invented because of your failure. Bitcoin solved the problems You created

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

It wouldnt matter The only stability moving forward will be with DeFi not CFI or CBDC.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Its just another distraction, a tool to be used by centralized organizers of a failed system "Nonbank money" is everything better than what you provide

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Dont issue one! Just dont issue it.. A tool you could do is buy Bitcoin buy Ethereum and keep your hands out of peoples accounts. Maybe a bitcoin backed or ethereum backed token would work,, but the federal reserve is ways behind the power curve and has already lost trust

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

No Not important alt all DeFi exists because Central bankers robbed everyone

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

The US way of being in the middle of money transfers is over. It has already evolved and the

federal reserve is just now asking how to participate in the evolution? Too late, for you, you were supposed to be the leader and you failed everyone

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The US should make up its own mind. Ask congress.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

KYC is terrible idea Dont store peoples information , ever

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

It wont Its terrible thing run by centralized entity that only exists to expand itself and ensure its own success above all else.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

No comment

*14. Should a CBDC be legal tender?*

No absolutely not

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

What? How? From where? No are you serious,, buy HEX

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Yes control,, supreme control over the land, thats what you want to achieve with your cbdc.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

None Give up Go home Turn the lights off Or start accepting the reality DeFi has Won

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes Paperwallets Must we Teach you Everything about Money?

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Ask the creators of USDC Ask Jack Mallers

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Well crypto is being adopted by visa and mastercard The standards have already been updated, just not yours, everyone else is updating. Central Banks have failed to update, its too late now

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Well most will be DeCentralized so Centralized stuff is going away

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Design if so the federal reserve is the primary beneficiary from every single transaction. Design it so you have 100% access to everyones details, accounts and other information. Design it so you can cut off anyone without notice or freeze all funds of any adversary

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*Name or Organization*

Andrew Sears

*Industry*

Merchant

*Country*

United States of America

*State*

Pennsylvania

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

<https://www.bandlab.com/revisions/0b78e499-86c6-ec11-997e-28187831e8a1> Part 1: Bitcoin and Ethereum There is also a part 2 And e have some drawings on future currency Sibyl 248, Forgiveness 175, Grace 84, Sagittarius give, Supreme Pizza make them liquidate that this is Bitcoin and Ethereum and it will keep being more. Thank you Motley and Crew 1&2

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Taurus Sun, Aries Moon

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity*

*and facilitating illicit financial activity?*

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---

*Name or Organization*

Andrew Sears

*Industry*

Merchant

*Country*

United States of America

*State*

Pennsylvania

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

<https://www.bandlab.com/revisions/0b78e499-86c6-ec11-997e-28187831e8a1> Part 1: Bitcoin and Ethereum There is also a part 2 And e have some drawings on future currency Sibyl 248, Forgiveness 175, Grace 84, Sagittarius give, Supreme Pizza make them liquidate that this is Bitcoin and Ethereum and it will keep being more. Thank you Motley and Crew 1&2

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*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

---

*Name or Organization*

Wilbur Fleck

*Industry*

Other: Retired banking and insurance

*Country*

United States of America

*State*

California

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

TRUST Money is founded on trust. Similar to the way chairpersons of investigative commissions are chosen for their existing high level of trustworthiness and freedom from bias, CBDC should be a dedicated department in the Federal Reserve and the head of that department should have a widely known high level of trustworthiness and freedom from bias. I think this is even more important than their economic/finance expertise.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

**DIVERSITY OF DESIGNERS AND DEVELOPERS** The Federal Reserve should seek to have diversity both in the group that makes the design choices while writing the specifications and in the group that develops the software. The design group would include not only people with expertise such as government policy and economics/finance, but also people whose only qualification is the ability to articulate the needs of groups who may not be otherwise represented in the design process, for example, people on the have-not side of the digital divide.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

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*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

**SHARED OWNERSHIP** For both joint accounts at commercial banks and scenarios that involve joint endorsement the Federal Reserve could consider making digital currencies with appropriate compatibilities or deciding to let these services be handled by bank-created money and physical currency.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

**AVOIDANCE OF BACK SEAT DRIVING** By seeking input from the public and collaborating with Congress, the Federal Reserve is doing due diligence fact finding/discovery effectively and completely. When the framers met to write the Constitution, they shielded themselves from outside influence by closing the doors and windows. Similarly, during deliberations juries are insulated from outsiders and when we go into the voting booth we close the curtain. The gravity of the design and development of digital currency makes it fitting that once the fact finding/discovery is completed the design and development processes are shielded from back seat driving by being done behind closed doors. **AVOIDANCE OF POST-DESIGN CHANGES** Also, there should be no overlap between the design and the development. Put differently, even though the creative process includes the potential for endless tweaking, there should be a point at which the design is frozen and there are no design changes after the design is given to the developers. This will be hard to achieve but it can mitigate some complexity in the software and therefore generate fewer unintended consequences. It will also avoid the costs of undoing and re-testing.

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

14. *Should a CBDC be legal tender?*

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

**OPEN BANKING** Open Banking and Banking-as-a-Service offer exciting possibilities to empower consumers, but they also have significant risk. If safeguards against these risks can be baked into digital currencies, the Federal Reserve should consider including the safeguards in the designs.

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

UPDATING CBDC should be structured to enable development of versions 2.0, 3.0, etc.

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

**DIVERSITY OF USE CASES** Cars are made in a wide variety of models that are tailored to different uses. To avoid applying programmed controls to all users even though the controls apply only to some of the users a variety of digital currencies could be deployed. For example: a currency tailored to family/student education spending and borrowing; a currency tailored to shared liability for payment such as medical bills paid by both the patient and the insurer; a currency tailored to controlled purchases such as purchase of prescription medications or firearms; a currency tailored to spending that has external oversight such as spending by government agencies. **SELF-PERSONALIZATION** If the Federal Reserve chooses to deploy an e-wallet for mobile devices, it would be useful if the e-wallet had a settings screen. For example, the user could register with the Federal Reserve a payable-on-death beneficiary (Totten Trust) for the contents of the wallet. Upon receipt from the beneficiary of proof-of-death of the wallet owner, the Federal Reserve would either transfer the contents of the wallet to the beneficiary or void the contents of the wallet and issue an equivalent amount of currency to the beneficiary. **ONGOING SUPPORT** The Department of Health and Human Services gave health care providers and software developers 8 years to migrate from paper health records to electronic health records. Even after the close of the migration period HHS provides support to the providers and developers. For example, it maintains an outstanding website (<https://www.healthit.gov>). The Federal Reserve should create a website or several websites for ongoing support of consumers, banks, and members of the ecosystem.

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*Name or Organization*

*Industry*

Technology Company

*Country*

United States of America

*State*

Wyoming

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

It is likely that the risks may be mitigated to potentially be nonexistent with the proper settlement instrument being developed deployed and adopted.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes definitely, please look at the ERC20 monetary-gold digital asset USG at:

<https://BuyUSGold.com> It would be impossible for the US Government not like it's own Treasury digital gold currency tokenized on the blockchain for future mass adoption.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Unfortunately it's a Catch 22. In the event that is CBDC were to be gold backed digital dollar or better stated – a monetary-gold digital dollar – an asset like the USG, a Direct Digital Representation of United States gold coinage – such as the 1oz American Eagle Gold coin – than the possibility would exist that the global demand would be for the better US Gold dollar or than the US Fiat dollar. Naturally the possibility exists that further diminished buying power or better described erosion of the US Fiat dollar would likely occur.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

One only needs to look at the the Roman empire and its ultimate collapse to identify what citizens truly desire. In the beginning the Roman coins were minted as a 100% silver coin, and at the end of the empire the same coins were minted with less than 5% silver. If there were to be a US fiat dollar reset with a digital replacement backed by Monetary Gold the stable price buying power (stronger economy and employment) would become instantaneous and the demand for the digital asset globally could be controlled by the supply – further strengthening the value of the digital gold dollar – a new United States "Gold" reserve currency.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

The CBDC requires the ability to make the market, by supplying it upon demand and pulling from it when there is less demand. Accomplishing this with a digital gold dollar would be a global game changer with a tremendously positive impact. As gold has been a store of value, and its price has been tracked for over 2000 years, naturally it is the choice that is necessary for at least the G7 and likely the G20 to embrace. Think of this as a new Bretton Woods the original in 1944 in preparing for the end of World War II and the rebuilding of the nations and their economies, the only difference now is it's a Bretton Woods 2.0 conversation, inviting the participating nations back to the table and embracing a new an improved monetary system.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Perhaps a better question is why would any government allow the competition to exist. Technology is simply technology, what is been happening over the last decade is the monetization of the technology in the emerging markets of cross-border settlement upon new Blockchain technology and ultimately new merchant PoS networks. The central banks could easily take on this new role and probably manage the responsibility in a way that private companies may find challenging. Adoption and or fourth adoption being the single largest barrier to entry and ultimately success.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

It's a very good question I don't think there is a very good answer. If there isn't a blending of the public and private sector to provide the transactional instrument as well as the settlement instrument which could be all inclusive but likely better separate, then it's likely the central bank will have to be the leader within the emerging market.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Look no farther than the information and format of the USG and the potential for a fractionalized version of the USG – in a dollar form. Such an instrument (USGD) would be in higher demand globally than that of any alternative dollar backed so-called stable coins. After all it would be a US Gold Dollar (USGD).

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

They will likely develop as an alternative Visa or MasterCard remittance platform. All settled in real time with transparency upon a Blockchain. Banks could become sponsors to a new alternative platform, however, it's likely that through the inspiration or better stated the desperation of the countries outside the borders of the US will embrace those alternative systems because they are absent access to the visa and MasterCard international programs. In a current model it's a credit qualifying criteria to become a merchant, and an alternative system there's no extension of credit, and thereby a massive adoption by merchant because they're not being declined in the process. Their GDP is are likely to increase dramatically as a result of such access. Obviously they're not simply selling locally in the market but able to sell their products globally through current Internet and developing Web3 technology.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The United States must be the leader. As the current reserve currency – a result of Bretton Woods Accord in 1944, and had it not been for the Nixon shock on August 15, 1971 we would still have some ties to a Tier 1 asset – Gold. The world understands that it settles its debt using the dollar providing that dollar in a digital form that is actually backed by a hard ass it would cause a continuation of the reserve currency without interruption. Anything less than that conversation and that criteria that ultimate goal may see one of the foreign countries take that leadership role on and become the reserve currency. It would be imperative that the G7 or the G 20 sit at the table and discuss a way to interact with a similar settlement instrument of their own similarly backed.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

It's possible that without the immediate action of establishing a CBDC that is backed, alternative remittance platforms will emerge through inspiration and likely the desperation for that improved system within the now described meta-verse.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

The easiest answer that question is establish thing a Blockchain that identifies the digital wallet addresses attached to a distinct legal entity and or individual regardless of their domicile. By doing this government can enforce rules and regulations upon the responsible party of the public wild address.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

That answer is yes by default. In the absence of a country's leadership providing the better legal tender there's no reason for mass adoption and change. As a potential result, a CBDC might find that the digital instrument becomes a de facto legal tender.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Just as an individual might have multiple interests in distinct legal entities, it is likely that he's single and user would access additional public wallet addresses and in turn surpass any quantity limits that might be imposed from the onset.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

At the point of sale or POS any agreed-upon instrument for settlement makes the platform agnostic. To break into a better remittance platform, a digital Blockchain settlement platform, the selection of the better settlement instrument is all that is necessary. The better instrument naturally a gold digital dollar.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

The answer may be that the CBDC is nothing more than a transactional token for the benefit of the ledger entry system. Checks and balances. However if there is a pairing between a CBDC and say a USG or a USGD, then the role and responsibility can easily be managed by properly licensed Digital and Traditional exchange platforms. US banks, US broker dealers – that are FINRA regulated, are easily the path of least resistance and immediate adoption in the marketplace. New technology standards were always be developed, and cross block chain activity is easily accomplished today.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

One thing for certain is everything is temporary and change is constant. Any forward thinking technology innovations will simply improve access speed of transactions and transparency. The core question that must be asked is what is the instrument by which the settlement is taking place and if it is nothing more than a transactional token is there a pairing into a hard asset class token. That hard as a token will naturally have liquidity on the existing exchanges, banks with future regulatory expansion, and then FINRA broker dealers.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

The single most important decision that comes out of this process is the true and accurate stable value token that is a true store of value. The USGold (USG) token is a direct representation of the United States minted 1 ounce gold American eagle coin (Real US Currency) it was developed for the purpose of demonstrating how it is a utility token, a utility in that it serves a purpose, a settlement instrument. If he say BDC or Tamir this approach it would have global globalit was developed for the purpose of demonstrating how it is a utility token, a utility in that it serves a purpose, a settlement instrument. If he say it was developed for the purpose of demonstrating how it is a utility token, a utility in that it serves a purpose, a settlement instrument. If a CBDC were to mirror this approach it would have global dominance as a leader. However, if the ultimate question is scalability, transactional speed and ease of use through new remittance platforms, then it should simply be a transactional token for the purpose of ledger entries. It then can simply be paired to one of the many other so-called stable value coins that have some other type of asset that backs them.

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**1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?**

Using a balance of financial institutions reserves held with and backed by the Fed for digital fiat currency (effectively bank issued stablecoins), these FIs can be authorized to be able to issue and circulate the digital currency between each other and their customers. The end customer new digital currency accounts would ideally also be FDIC backed. This could be an alternative for a retail circulation of funds with comparable credit and liquidity considerations to how it was described in the paper for Fed direct issued CBDC and corresponding accounts with them. A CBDC exclusively for wholesale bank to bank settlement could also be used to facilitate interbank settlement for when the retail bank issued digital fiat currency is taken out of circulation for exchange back to "legacy" deposit funds or cash to the retail customer when the retail digital currency was issued by another FI. This same wholesale CBDC could also be integrated as an optional settlement method for other existing payment rail settlement for what these rails can continue to provide clearing data services.

**2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?**

The Fed could be the oversight body for the retail level bank issued stablecoins in a manner similar to the relationship and oversight the Fed has for existing bank accounts. Another oversight option could be where the fed is just an active facilitator and collaborator in a bank issued stablecoin network similar to the role they play in the Business Payment Coalition Exchange Framework Oversight Committee.

**3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?**

Financial inclusion could be achieved where the bank issued stablecoins could be interoperable with new types of accounts which have lower or even no KYC requirements, but which have limitations in terms of maximum individual and/or cumulative transaction and account balance limits. These new accounts could be either bank or non-bank issued where non-bank issued accounts would need to be through MSBs as they are today as they reach and serve the unbanked and underserved. These non-bank entities would not be stablecoin issuers in this ecosystem design, but could be distributors of the bank issued stablecoins and/or CBDC. These types of account could also be used in conjunction with offline use of these digital fiat funds, where the offline transactions could optionally be totally anonymous or at least pseudo-anonymous. All online transactions should also be pseudo-anonymous and follow BSA and AML regulations. The limitations of the anonymous (or lower KYC) accounts could be kept within AML limits.

**4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?**

**5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?**

**6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial**

*sector differently from stablecoins or other nonbank money?*

Since a CBDC would be safer and more attractive than current private non-bank stablecoins and other non-bank money, it would have a much larger impact on financial institutions which could loose deposits needed to enable them to continue to have funds for loans. This would then create a need for loan seekers to seek alternative and potentially unregulated lending services. If these FIs were able to have digital accounts that the CBDC and/or bank issued stablecoins could circulate through where partial reserves could be used for lending as it is today, then this would be a better solution.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

The tools to consider include structure and software to enable and control new types of lower or no KYC accounts with limits within AML triggers. Another set of tools would be software that supports offline distribution, use, and conversion back to online versions of shadow copies of all offline tokens that sync with their online issued copies after either device they were transacted offline connects to the internet. A library of open source development tools/APIs to enable all sorts of functions around the issuance, distribution, use, redemption, account management, and use case specific functions would also be helpful as well.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes, but with similar limits such as those for ATM withdrawals to the lower or no KYC accounts which could serve as a cash equivalent alternative.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

The continued adoption of faster payment solutions in the US along with efforts to enable these to be interoperable for cross border transactions can bridge the gap until when and if a CBDC or a bank issued stablecoin network with oversight by the Fed, or Fed participating overnight body, can evolve starting with how the digital fiat could be an optional method of settlement to the clearing methods on these faster payment rails.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

As the paper pointed out, there is concern about some of these other CBDC efforts, such as by China, will affect the US dollar's prevalence as accepted currency outside of the USA. We do not want to wait and see to the point of being too late to loose some or all of this strength of the US Dollar which could affect US cross border commerce. The US should continue its efforts to at least be ready, willing, and able to move ahead once all requirements, policies, and testing can be done. It should avoid saying that it no longer sees a need and benefits to continuing this pursuit, which would have others take more of a center stage which could have adverse affects that were already pointed out about the adoption of alternative to a US CBDC or a central bank overseen network of bank issued stablecoins.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

All transaction detailed data, including personal and confidential data, need not be stored in the CBDC ecosystem other than a pseudonymous id that FIs that onboard customer accounts that hold CBDC funds. The FIs in turn record the applicable separate KYC information in their systems and are only accessible to them and the end customers this data belong to plus to the transacting parties and their FIs where only the necessary information for the receiving party to verify the sending party is needed. As described in other responses to this RFC, some of the end user accounts could have lower or no KYC when the account has applicable limitations to its use. There would still be a pseudonymous id at least tied to a government issued identification for less limited account usage, and perhaps just a biometric hashed id of an anonymous account owner where that biometric id could not be associated to the identity of the account owner, but could at least be used to control access to use of the account.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What*

*operational or cyber risks might be unavoidable?*

One of the key features should be that each CBDC token can be verified as one that originated in its ecosystem which has controls over the parties that can issue and hold reserves, distribute, and/or record transactions in the ecosystem on behalf of their customers. The access methods and controls for these operators needs to be as secure as possible to prevent cyber attack and the requirements for access to the operator's systems needs to be just as secure to prevent attack from within one or more of the operators. All transactions should be credit push and not debit pull as is the case for the real time rails of TCH and FedNow. These things do not preclude fraud at the end user level to address account takeover, synthetic identity, and some of the other types of fraud that we continue to see and as classified in the Fed's fraud classifier. The CBDC ecosystem design could also include a means of fraud information sharing across FIs, including blacklisted or suspicious accounts and party identities. It could also provide a means of detecting AML across multiple FI accounts linked to the same party ids. The ecosystem design could also include additional means of identity registration and verification of onboarded end customer payers and payees that funds are being transacted to. Some key directory functionality could be provided along the lines of some of the characteristics as described in the white paper from the Directory Models Work Group of the US Faster Payments council.

**14. Should a CBDC be legal tender?**

What difference would this really make as long as it would be "good funds" and eventually available to all (i.e. ubiquitous)?

**15. Should a CBDC pay interest? If so, why and how? If not, why not?**

No in the case of where the account were one held directly with the Fed, which I disagree with. For intermediated accounts, especially per the bank issued stablecoin approach, these accounts should be eligible to earn interest comparable to interest available with checking accounts. Other forms of economic incentives could be provided as well by intermediaries similar to incentives for debit and credit card usage when they process transactions through the CBDC ecosystem that they are permissioned operators for.

**16. Should the amount of CBDC held by a single end-user be subject to quantity limits?**

Only in conjunction with lower or no KYC accounts as described above. Cross border transactions and accounts holding US CBDC that may be in other countries may need to have applicable limits as well. The total CBDC (or bank issued stablecoins) in circulation should be limited along the same criteria of the total of printed paper and minted coins.

**17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?**

There could be multiple levels of intermediaries in the CBDC ecosystem, much like there is today, where only those that are currently eligible for having accounts and reserves with the Fed should be the top level. Then smaller FIs and Fintechs of these top level or Fintechs of the lower level FIs could be nested sub-accounts where access to the CBDC does not dis-intermediate the FIs that have the ultimate compliance, including security controls over access to these sub-accounts in the ecosystem which serves as a "book of record" that effectively enables a distributed open banking capability in conjunction with the CBDC ecosystem design. In Vments FedNow RFC response, there is additional detail provided in the sub-account design along with other design specifics relative to the ecosystem involving bank issued stablecoins.

**18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?**

Absolutely for a number of reasons, including if and when the lights go out as well as for where internet access may be limited, which can be more prevalent for those that are unbanked and underserved. A design that can support this is one where each CBDC token online includes an optional offline device id that it was downloaded to where it could be transacted offline and then synced when either party of the transaction connects online. There are many other details about the specific of this offline design and issues that it needs to address which can be provided upon request and are too long to include in this RFC, but which were included in Vments FedNow RFC response.

**19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?**

This needs to be an absolute requirement to foster adoption. The use of digital wallets, QR codes, biometrics, and directories using aliases, can all contribute to ease of use and acceptance. The offline capability at point of sale should also be considered here, where at least the merchant can be online to real time validate the offline tokens it accepts, or its device can at least check for CBDC token watermark type validation plus transacting party validation against a downloaded blacklist of bad actors, including those that had attempted to backup, restore, and reuse already used offline CBDC tokens.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

The CBDC tokens could be integrated as an optional means of settlement in existing payment rails where these rails at least continue to serve as clearing for the transaction data optionally real time settled using the CBDC (or bank issued stablecoin equivalent).

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

The sub-accounts design described above could be provided through a distributed ledger as the “book of record” for the minimal transaction information that can be stored and accessible to the participating permissioned operating parties where the information is pseudonymous and have just enough to be able to effectively enable a peer to peer transaction between operators that then transparently facilitate the same through their sub-account intermediaries and in turn to end customer user experiences. The intermediary operators would also have cloud and/or on-premise servers that interface and hence reconcile to the distributed “book of record”, where these servers can include the data necessary for the operator’s compliance with all applicable regulations for being such financial services. An addition and very unique design consideration is where the CBDC tokens (or bank issued stablecoins) could be issued into a line of credit account where this affects the reserve requirements versus when these same tokens are issued into a “cash” account. Then as the line of credit tokens are used, they become cash to the receiver and part of the balance due the lender, who in turn needs to adjust their reserves accordingly. Smart transactions is another design concept where the cloud and/or on-premise servers described above can record detailed transaction data not shared in the distributed ledger other than for hash control totals to be able to help validate that this off distributed ledger data has not changed and is effectively immutable as well as is the distributed ledger data. This requires applicable blockchain functionality for security and protection over any of the data being modified versus incrementally adjusted through new transaction data. All of the features described within this RFC are included in Vments ecosystem design which I would be happy to share with those interested to learn more about. In my response to the original FedNow RFC, I had included several details about the specific design of the digital fiat token, tiered sub-accounts, smart transactions, and more.

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*Name or Organization*

David Lon Bishop

*Industry*

Individual

*Country*

United States of America

*State*

California

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

It would create a system that could take spending decisions away from the individuals that earned the money and would place it in the hands of the government and politicians. If someone fell into disfavor, they could instantly be stripped of the money which is what they need to survive. When you have the ability to strip people of their financial resources, it gives the government too much leverage over the governed.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Just let people live free from an overbearing government. Financial freedom is an important freedom.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Senior citizens like me would be largely excluded because we be forced to pay for things in a way that is foreign to us. How would we handle trust accounts? What happens to our life savings if we cannot readily access our money without government oversight? Smart people will be buying up gold and precious metals to avoid CBDC.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Why doesn't the government just allow our free enterprise system set its employment and price -stability goals through supply and demand like we have done for over 200 years. If a good or service is worth a price a buyer is willing to pay, the price is set by free trade.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Negative. Any time the government artificially sets a price for some good or service, it distorts the price for that good or service that would be set by free and fair trade.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

It would be a disaster. I do not believe in Bitcoins or any form of currency other than money printed by the government. If people want to freely invest in nonbank money, they should be free to without the government trying to compete by compulsion.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

The government should just avoid the whole thing.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

NO! I can go to my bank and put money on my ATM card or fill my wallet with cash and buy what I want. The less interference from the government in my banking business, the better. There is no problem with the current system and I would like to keep it that way.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

So far, no problems. Let us keep it the way it is.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

We do not spend Euros here to buy things and if Germany decides to use CBDCs within their borders, it their business. Goods and services cross borders so foreign currencies should not influence economic decisions in the United States.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

If you think trusting the government with your life is a good idea, you might what to talk to some Indians. Will the servers that will contain all the information related to everyone's finances be protected against EMP waves or any other type of attack?

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

People have disclose information during a transaction. How do unknow what you know?

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Keep it dispersed like we do now in private banks. I go to my banks once a month and do my banking in front of a teller. I works really well.

*14. Should a CBDC be legal tender?*

No.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

No.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

No. How do you buy a house or a car?

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Do not fix what ain't broke.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

The cash in my wallet already has an "offline" capability. Why change what already works.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

I do not have a problem buying what I want now. Why mess it up.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Use cash.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Expect oppression from those that control the financial transactions of everyone in the country.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Revelation 13:16,17 say, "And he causeth all, both small and great, rich and poor, free and bond, to receive a mark in their right hand, or in their foreheads:" "And that no man might buy or sell, save he that had the mark, or the name of the beast, or the number of his name." The CBDC will be implemented because Bible said it 2000 years ago. Those that create this system will face the judgment of God.

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*Name or Organization*

Kate

*Industry*

*Country*

United States of America

*State*

Pennsylvania

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Risks: Government outreach in a form of total control over individuals' money, such as punishment if a form of cutting access to funds for whatever reasons government decides to do. Canada was perfect example when they cut access to peoples bank accounts during truckers protests. Control of whether individual must spend money or not through negative interest rates. Privacy violations.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

The current system is efficient enough

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Negative, especially for older people, usually struggling with computers, digital accounts, whose mental abilities are declining to understand constantly changing rules and policies. Physical cash also helps staying within the budget and not overspend, thus lower income families will be in struggle too due to ease of overspending.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Negative. Due to government total control of all the "money". And government already a horrible spender and overspender and cannot manage budget effectively.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Cbdc would hurt banking industry completely. Why do you need a bank if federal reserve issues, distributes and holds individual's funds through its own system of accounts? Is federal reserve also going to give out loans and mortgages since it is the only owner of currency?

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Cash should always be accessible and accepted as the form of payment everywhere, no exclusions. Businesses should be prohibited under threat of penalties from not accepting cash.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S.*

CBDC?

10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

United states shoukd focus in its own issues and matters, and not trying to “keeping up with Jones”. USA should keep its nose in its own plate.

11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

No

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Not possible

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Cyber hackers do develop along with technology development. There is no perfection and never be, weak points woukd be present regardless, thus cyber criminals would still exist and perfect their “skills”

14. *Should a CBDC be legal tender?*

No

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

18. *Should a CBDC have “offline” capabilities? If so, how might that be achieved?*

Yes. It is called cash.

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

Kate

*Industry*

*Country*

United States of America

*State*

Pennsylvania

*Email*

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The current system is efficient enough

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Negative, especially for older people, usually struggling with computers, digital accounts, whose mental abilities are declining to understand constantly changing rules and policies. Physical cash also helps staying within the budget and not overspend, thus lower income families will be in struggle too due to ease of overspending.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Negative. Due to government total control of all the "money". And government already a horrible spender and overspender and cannot manage budget effectively.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

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CBDC?

10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

United states shoukd focus in its own issues and matters, and not trying to “keeping up with Jones”. USA should keep its nose in its own plate.

11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

No

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Not possible

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Cyber hackers do develop along with technology development. There is no perfection and never be, weak points woukd be present regardless, thus cyber criminals would still exist and perfect their “skills”

14. *Should a CBDC be legal tender?*

No

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

18. *Should a CBDC have “offline” capabilities? If so, how might that be achieved?*

Yes. It is called cash.

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

*Industry*

Individual

*Country*

Mexico

*State*

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Cash everywhere

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

No

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Positive

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

No

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*
14. *Should a CBDC be legal tender?*
15. *Should a CBDC pay interest? If so, why and how? If not, why not?*
16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*
17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*
18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*
19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*
20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*
21. *How might future technological innovations affect design and policy choices related to CBDC?*
22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

Katelynn vanecek

*Industry*

Individual

*Country*

United States of America

*State*

Wyoming

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

None as I could read

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes of course there's always better achieving opportunities for everything

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

No, positive

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Positively

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Negative

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Yes, non bank money

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Unsure, possibly

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Greatly

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Yes

11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?

Unsure

12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?

Unsure

13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?

Unsure

14. Should a CBDC be legal tender?

Yes

15. Should a CBDC pay interest? If so, why and how? If not, why not?

Yes

16. Should the amount of CBDC held by a single end-user be subject to quantity limits?

No

17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?

Unsure

18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?

Unsure

19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?

Unsure

20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?

Unsure

21. How might future technological innovations affect design and policy choices related to CBDC?

Unsure

22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?

Unsure

---

*Name or Organization*

*Industry*

Other: Civil society monetary movement

*Country*

United States of America

*State*

North Carolina

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

A national CBDC has to conceive on the international level of a transformed international monetary system which can be called Bretton Woods 3.0 that is very fundamentally different from the reformist Bretton Woods 2.0, proposed by the IMF and followed by Kevin Gallagher of Boston University and Richard Kozul-Wright of UNCTAD in their 2022 Polity publication The Case for A New Bretton Woods. This transformational Bretton Woods 3.0. deals with the real global emergencies in climate, health, food and governance. What is needed for such Bretton Woods 3.0 is the Tierra Monetary Paradigm (TMP) in which its monetary architecture is built on the monetary decarbonization standard of a specific tonnage of CO2e per person as proposed in Verhagen 2012 "The Tierra Solution: Resolving the Climate Crisis through Monetary Transformation". This TMP also includes the global Tierra currency that would be created, distributed and supervised by the UN People's Bank which would be a Federated Global Sovereign Monetary Authority (Global Fed). The USA and other nations can work towards this Tierra Transformed International Monetary System (TTRIMS) by adding the decarbonization/optimal solarization monetary mandate to its dual mandate of full employment and price stability, thus making a national monetary step to the goal of a safe, sustainable, and, therefore, stable international monetary system. Designing a CBDC without an integrated international sustainability framework will not lead to national, let alone international monetary progress.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes, see question 1

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Depends on the nature of the financial inclusion in a transformational or reformist national/international monetary system.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

A U.S. CBDC should be part of the Tierra Transformed International Monetary System (TTRIMS)'s global currency of the Tierra that is created, distributed by the UN People's Bank which functions internationally as the Dr. Omarova's People's Ledger functions nationally. Such transformational CBDC can not only implement the dual mandate of price stability and full employment, but also, the necessary the third mandate of decarbonization/optimal solarization that will contribute to advent of the monetary standard of TTRIMS.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

The transformational CBDC would advance stability because it is rooted in a just, sustainable and, therefore, stable TTRIMS.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

No stablecoins and crypto in general are part of TTRIMS. As a matter of fact, the TTRIMS and its Tierra Monetary Paradigm (TMP) are a complete system that is the real competitor to the crypto world. As a matter of fact, the TTRIMS and its Tierra Monetary Paradigm (TMP) form a complete system that is the real competitor to the crypto global system. The real challenge of the US Fed is to lead with TTRIMS and TMP in the global battle of making the crypto world subject to the UN People's Bank.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

The financial sector whose dominance has led to the financialization of societies, has radically changed in the TTRIMS framework with its TMP as the fractional reserve system is abolished and banks are to operate on 100% reserves.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

yes

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

The payment system will stumble along in the present unjust, unsustainable, and therefore, unstable international monetary system. In TTRIMS/TMP pathway the Tierra balance of payments system accounts for both financial and ecological (climate) debts and credits presenting realistic monetary planning rather than reacting to events within and outside the crypto world.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The USA should go beyond the resources of the Bank of International Settlements and the IMF and convince nations to participate in the launching of the UN Commission of Monetary Reform and Transformation which would review theoretical and practical monetary advances since Bretton Woods 1.0 and would engage in utilizing the international monetary system for building up a sustainable economy and a just and sustainable global governance system.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

The main risk of the present reformist approach to CBDC is the one of not developing an international transformational framework that would resolve many problems that are not resolvable within a national monetary framework.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

The Federated Global Sovereign Monetary Authority (Global Fed) of the UN People's Bank would be able to develop the proper balance given that its governing Central Banks representatives have the power to straighten out this concern.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Same answer as in #12.

*14. Should a CBDC be legal tender?*

The Tierra single global currency would be legal tender for all nations. The value of a national or regional Tierra would depend on the nearness of the Tierra decarbonization standard of a specific tonnage of CO<sub>2</sub>e per person. The average tonnage is 4 tons of CO<sub>2</sub>e with a wide range of tonnage of a small developing below one ton and the top tonnage of 23 per person in the USA.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

The digital currency of the Tierra is used in the Central Bank's accounts of both individuals and organizations. Given that both commercial and public banking systems are not creating money in the form of Tierras, the central bank members of the UN People's Bank could agree for practical purposes to charge a stable, minimal amount of interest. Note the governing board of the UN People's Bank do not need revenue from interest because it is sole creator, distributor and overseer of Tierras. Also, the national fiscal systems do not need to raise money through taxes. Their main purpose is to reduce inequality. As shown by Michael Hudson, Assyrian and Mesopotamian civilizations had laws to reduce economic concentration of land every fifty years. The Jewish Jubilee had a similar objective.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Yes, to reduce economic concentration and its associated political power in the financialization of societies.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Banks would become utilities without the privilege of creating money.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

No, because the "Offline" entities cannot be engaged in creating money, though those entities could be engaged as distribution channels.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

The Tierra would easily be used at the point of sale. Besides its role as means of exchange it also functions as a store of value when saved by individuals and organizations.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

This transferability across multiple platforms is one of the main advantages of an international monetary system with a single global currency as the Tierra.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Design and policy choices derive from the TTRIMS/TMP pathway that promotes the needed technological innovations.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

In conclusion, CBDC issues cannot be considered without its international dimension as is made clear by Jamie Martin of Georgetown University in his forthcoming book of the *Meddlers*. As a sustainability sociologist of international development with a focus on the transformation on the monetary, financial, and fiscal subsystems of the world economy I have been advocating for over a decade a monetary pathway as opposed to a geoengineering pathway out of the present world disorder with its emergencies in climate, health, food and global governance. We can transform that human-made rule-based world (dis)order by basing the unjust, unsustainable, and therefore, unstable international monetary system on a decarbonization standard of a specific tonnage of CO<sub>2</sub>e per person with its digital currency of the Tierra that will be created, distributed and supervised by the UN People's Bank which is considered the Federated Global Sovereign Monetary Authority(Global Fed) of the 21st century. The world community in the global North, South and East and West needs to move away from the unjust, unsustainable, and therefore, unstable international financial debt-based system to a money-based system within a decarbonization-based international monetary system with its inequality-reducing fiscal system.

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*Name or Organization*

*Industry*

Other: education

*Country*

Netherlands

*State*

*Email*

1. *What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*
2. *Could some or all of the potential benefits of a CBDC be better achieved in a different way?*
3. *Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*
4. *How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*
5. *How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*
6. *Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*
7. *What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*
8. *If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*
9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*
10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*
11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*
12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*
13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

14. *Should a CBDC be legal tender?*

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

*Industry*

Technology Company

*Country*

United States of America

*State*

Delaware

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Multiple comments from multiple people follow:

- o Inaction or delayed reaction by the Federal Reserve may give cryptocurrencies the time to solve implementation imperfections and become de facto currencies, much like the USD has become the currency of choice in Venezuela. This is undesirable because the central bank could lose monetary policy effectiveness and the banking system at large would also be sidelined.
- o Strongly consider using US CBDC as a beneficial tool for international political and financial stability - in other words, as a tool of State. Today we have countries (like Ecuador) that rely on USD as fiat. We also have many countries (esp where inflation is higher) where there is a gray market in physical USD - extending that to digital currency would be very interesting to think through.
- o Potential benefit - provide every US citizen with a fixed monetary benefit they can tap into, toward whatever social programs they need at various times in their lives. For example, in 2021 the US spent 5.1% of GDP on Social Security vs 4.1% of GDP for Medicare - what if people could shift funds from one to the other as desired? Or fund basic needs earlier in life? The resulting freedom might lead to a worse end-of-life (if Medicare is sacrificed), but the tradeoff for a higher quality of life earlier might be worth it.
- o First, please consider that CBDC does not need to be synonymous with crypto-currency. The main point to consider is that the nation does not have a means currently for digital transactions that are cash-like and for which the cost of the transaction is largely covered by the government. Today's cash infrastructure is primarily paid for by the government's expenditure on the printing, minting, and distribution and management of paper and metal cash in the form of banknotes and coins. A digital method of transaction which is cash-like is possible without reliance on cryptographic techniques.
- That said, benefits of cashlike digital transactions include near-zero cost of transactions for all, reduced fraud, greatly reduced risks of identity theft, and reduced crime.
- o A US digital token, in our perspective at Vaiu Global Inc., is not necessarily recorded on the blockchain; we use the term token independent of blockchains. Such tokens will be stored in regular modern databases protected by existing bank security. Social policy, economic policy, and targeted policies for communities can be implemented via an account-based system.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes. The current direction of cryptographic CBDC upends all current central bank monetary controls and payment infrastructure and could lead to bank disintermediation. The move is drastic, unneeded and is revolutionary when an evolutionary approach should be used. The current Central Bank monetary policy tools work, money is already digital inside the banking system, so the only thing that needs to evolve is paper money. However paper money has 2 sides to it discussed even in the earliest bitcoin papers. The first is money as a value storage medium. Bitcoin and other crypto currencies do this well, albeit wasting a lot of energy, but that is improving. The second is a level 2 transaction network. This in turn is not a strength of cryptocurrencies. However, there is no need for the storage medium and the transaction network to work on the same technology. In fact monetary policy is simpler when the two are separate infrastructures. The Central Bank should seek solutions from the private sector, issuing an invitation to tender for a national payment infrastructure technology contract. The tender should be open to new entrants and not exclude based on size, payment operator experience, or cryptographic technology. The current infrastructure is already a global oligopoly. The tender should also allow improvement proposals in any elements of the

current banking infrastructure. Current CBDC initiatives globally use blockchain and DLT technologies, which are great, but there are alternatives, and we believe are the better solution. Once the payment infrastructure technology is defined, operator contracts could also be tendered so that systemic risk is minimized. The DARPA SBIR program is an example of how to incite cooperation with the private sector while respecting intellectual property. Research and development requires the brightest minds, and sometimes those are in the private sector. The United States Federal Reserve should let the global population of the world propose the best possible solution to the digital dollar. We believe it is a solvable problem today, and the faster the digital USD is implemented, the faster the economic advantages will be evident.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

We believe there is a potential hindrance to inclusion - related to the excluded person's safekeeping (from theft and destruction), upkeep (charging, not accidentally damaging) of the device/money as well as pervasive access to connectivity; as well as the possibility of selling the device for other more urgent or desired needs. Positives: 1) Cash can be lost or stolen - easier for some who need inclusion. 2) Unbanked are sometimes unbanked due to unwanted costs. CBDC accompanied by an agency or policy to provide free service to the otherwise-unbanked would remove that barrier. 3) Monies for social welfare programs such as SNAP, or temporary relief for disasters, one-time stimuli (e.g. COVID stimulus) can be transmitted instantly and more efficiently. 3b) \*If identity of spender is verified, it ensures monies are spent by the designated recipient 3c) If identity of merchant (or merchant type) is verified, it verifies monies are spent in the area they should be. 3d) Can potentially enforce good spending - for example, if people currently spend a monthly allowance in a week - you can allocate daily or weekly or whatever is most appropriate. 3e) Can potentially stimulate good habits, like saving money, by matching a % of money not spent.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

We believe moving transactions and cash more into the digital domain has the potential for much more efficient monitoring and management of where money is and how it flows, and much faster and more targeted delivery of money to where it needs to be. This can also be done far more cheaply than with physical cash.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Potential positive effects from: - ability to track money flowing through the system (at least at a high level), if that feature is built in. - being able to specifically stimulate or subdue certain areas of the economy in near-real-time. For example, with COVID we saw payments made to Americans (likely due to make up for loss of income) - but we could instead or as well have stimulated the economy by rebating/subsidizing X% of purchases in certain areas (restaurants) that were hardest-hit. Potential effects (not opining positive/negative) from being able to: - implement policies such as taxing assets over a certain amount that aren't being used (spent on things). - offering US CBDC to other countries - either as a 1:1 peg to the USD without it being a US-domiciled USD; or as a USD good anywhere in the world. (Also potential political stability, which affects financial stability) Potential large negative effect from risk of widespread compromising or misuse of the system, if there is a single system responsible for it all..

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Anything that can be done digitally usually comes with the ability to do things programmatically - so, faster / much higher volume / more coordinated - than when just humans. Programmatically hoarding money; "runs" on a bank; overloading the system with transaction volume; and more, are potential risks.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

(We are not sure we are interpreting this question properly.) We don't think of cash as

banknotes and coins - much of money and payments in the US today is already in digital form as far as the user is concerned. Instead, what is needed is a superior method of payment. Vaiu Global has developed what we call cash-like digital transactions, or CLDTs - which facilitate the movement of money among people and businesses in a cash-like manner. We believe this is a good and safe evolution of today's currency. If the question is, should physical cash remain an option that can be widely used for payments - our answer would be: (a) the US should strive for 100% inclusion and adoption if deploying a digital-only solution, and there are multiple barriers in place for digital that happening completely; and (b) as with any critical system, a fail-safe should be in place for transacting should the primary method be unavailable. Physical currency is one method - but one challenge is to know how much each person is entitled to - if digital cash is unavailable systemically for any period of time, odds are account balances are as well.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

We have already seen the trend towards the use of Bitcoin as the globally available medium of exchange with growing acceptance - there are several reasons for this: inefficiencies, high costs, and KYC-type delays in the current f/x market - including in cross-country remittances. (We believe anonymity is a factor for some, but not the primary motivator.) That hasn't stopped more classic payment options from seeking to themselves get cheaper, faster, etc - we will probably see multiple "winners" just as we have today, in the absence of - or even in the presence of - a non-mandated CBDC.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Continued US's financial and political leadership stability is aided by the world using the USD as a standard / benchmark / reference currency. The US should be doing everything it can to maintain and extend this position vs all other world currencies and alternate currencies - and continue enjoying its position of stability in the global markets. That includes incrementally evolving its monetary system to include digital representation of currency. We believe that licensed entities such as remaining as intermediaries trusted by the public is a good model for future success - and we believe that one driver of cryptocurrency and alternate currency adoption in some countries is a lack of trust in too much power being put in a government's hands.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

A multi-option approach would reduce risk and let market forces evolve an optimal solution. Rather than picking a solution, the United States should create guidelines and allow any solution meeting the guidelines, passing certain tests, to be "a" and not "the" digital cash solution protected by the laws of the United States of America.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Vaiu Global has developed a cash-like digital transaction which can be configured to preserve privacy without providing complete anonymity - using credential-free exchange of value. We are in conversation with banks to prove out this novel useful and non-obvious system for transacting and are happy to discuss further. Removing complete anonymity means associating someone's identity with each digital transaction - many (most?) Americans are concerned about government overreach in this area, and we feel they would respond with lack of trust in a solution that puts easy association of their identity to their movement of money directly in the government's hands. Delegating de-anonymization to the private sector and making requests for information transparent to watchdog groups or the public, over time, might help keep some of the public trust.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Much of today's money is already digital - with different financial institutions having their own resiliency and cyber security built into their part of the overall financial system. Continuing to leverage that ecosystem and modernizing a protocol different implementations from different participants would mitigate systemic risks. Vaiu believes strongly in this approach as a next-step for today's cash and commerce worlds - with a possible longer-term evolution to more centralized administration.

*14. Should a CBDC be legal tender?*

We at Vaiu Global do not see CBDC as a new "thing" to be or not to be legal tender. The question by itself indicates a bias towards a CBDC being a new thing. A CBDC need not be a new thing. The United States has a perfectly fine currency, the US Dollar. That is the currency. What the US needs to do now is to allow for cash-like transactions digitally of US Dollars. We call these CLDT: cash-like digital transactions. These need to be recognized and sanctioned and protected by US law, much as digital signatures became legally recognized.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

We believe this question may be biased towards an unnecessary change to the US financial system. US Dollars held in an account may or may not pay interest depending on what the market allows. A CBDC that pays interest is really a CBDC with a growing value. More interesting in some situations would be a digital US token that loses value over time. Such a token would encourage spending and increase the overall money velocity. If the question is whether the US Government should pay interest to CBDC holders (like a sweep account or certain Treasury instruments), that can certainly be an option. But this should be integrated into current national economic policy.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

We believe the United States should generally not limit the amount of money an individual can hold. It may make sense in the nearer-term for risk mitigation purposes to limit the amount of CBDC that can be held; it may also make sense to limit the duration of validity of any cash token for similar risk management purposes. We have implemented a short (single-digit days) lifespan of a token before returning value to the originating account.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

We at Vaiu Global believe that the entire US banking system should stay just as it is with no new intermediaries needed. No new regulatory structures are needed. New regulations will be needed for the use of digital cash by non-human agents.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes, definitely. There is no guaranteed ubiquity of connectivity anywhere today. We have done some thought/work on this, but will not share it in a public forum - please contact us for more information.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes, certainly; it will increase the likelihood of adoption and ubiquitous use. Our cash-like digital transactions (CLDTs) and our Vaiu Checkout product are designed to make transactions simpler, safer and speedier than they are today.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

We at Vaiu Global believe that cash-like digital transactions (CLDTs), as conceived and offered by Vaiu Global Inc. are in fact the solution to transferability across payment platforms, domestically and internationally, across currencies, and conditioned for acceptance. The new standard needed is one that defines the minimum cash packet structure needed to communicate a transaction's parameters. We propose our cash packet structure as a starting point.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

We at Vaiu believe that future technological innovations will enhance, but not entirely overturn, cash-like digital transactions, CLDTs. What such technological innovations will do to the alternative mainstream proposals of blockchain and cryptographic approaches to produce a "thing" called a CBDC are uncertain in our view.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Vaiu Global believes that CBDC does not need to be synonymous with crypto-currency. The main point to consider is that our nation does not have a means currently for digital transactions that are cash-like and for which the cost of the transaction is largely covered by the government. Today's physical cash infrastructure is primarily paid for by the government's expenditure on the printing, minting, and distribution and management of paper and metal cash in the form of banknotes and coins. A digital method of transaction which is cash-like is possible without reliance on cryptographic techniques. We call this a cash-like digital transaction or CLDT as an alternative to CBDC. The benefits of an economy running on cashlike digital transactions (CLDTs) include near-zero cost of transactions for all, reduced fraud, greatly reduced risks of identity theft, reduced crime, and immediate cash-like settlement of a zero-risk payment instrument.

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*Name or Organization*

Sally Jane Gellert

*Industry*

Other: citizen

*Country*

United States of America

*State*

New Jersey

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

This is not something that we should be pursuing; already, the private Federal Reserve has too much control over monetary policy, and we need to stay away from anything that gives the Federal Reserve more influence.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

There are no real potential benefits to a CBDC; for those who want them, there are credit and debit cards and digital currencies already; the rest of us are just fine with our private cash, thank you very much.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

A lot depends on implementation. More worrying is the ability of the centralized authority to track every transaction—a clear violation of every USAmerican's expectation of financial privacy and control.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

This is outside my expertise, but honestly, not a concern—we should not be creating a CBDC, so they can keep on keeping on—and let's have an audit, please, so that we the people, through our representatives in Congress (with open reporting to the rest of us) can keep tabs on this private entity.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

negative; it would give the Federal Reserve even more options for tampering with/manipulating the system

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

I am little concerned with the financial sector, which has way too much of an influence on our society as it is.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Just don't do this; no change, no impact, and we retain what little privacy we still have.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Cash usage must be completely, 100% supported, with few if any restrictions. Already, bank

reporting of \$10,000 transactions is an intrusion into many people's privacy. Let's not make things worse. Not everyone has or wants a bank account, or wants to do everything through an intermediary. Peer-to-peer cash transactions are important.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

outside my expertise—but there seems to be an awful lot done already with 1s and 0s—why not keep on keeping on?

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

They shouldn't. If we have a healthy economy, with every person having access to cash and employment, we need not worry about what others are doing. In fact, we should pull back a lot of our overseas military involvement to focus on our own needs, anyway.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

no; this is inherently a risky proposition that must not be pursued

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

It can't. Complete anonymity is necessary for freedom. There are other means to combat illicit activities.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Cyber risks are probably inherently unavoidable, and the same is likely true of operational risks—power fails, computers go down, etc. Yet I can still hand someone a dollar bill, and ze can still make change.

*14. Should a CBDC be legal tender?*

no

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

If they were to exist, which they should not, interest should be handled just as it is for real dollars.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Absolutely not—but then they should not exist in the first place.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Stop. CBDCs must not be created; therefore, they need no intermediaries.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Currency must work off line. Therefore, CBDCs must not be created without the same offline capacity as cash now—i.e., I need to be able to hand one to a neighbor.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

We have cashless options for those who want them. The rest of us insist on being able to use cash just as we do now.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

outside my expertise I can hand a coin or dollar bill to anyone.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

In frighteningly unanticipated ways—don't do it.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

There are no benefits; keep cash as it is and audit the Federal Reserve.

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*Name or Organization*

abdii mohmmmed

*Industry*

Bank, Small or Midsize

*Country*

Ethiopia

*State*

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

bank

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

2

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

3

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

500

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

5

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

10000

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

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*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

12

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

13

14. *Should a CBDC be legal tender?*

14

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

15

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

16

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

17

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

1929

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

20

21. *How might future technological innovations affect design and policy choices related to CBDC?*

21

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

22

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*Name or Organization*

*Industry*

*Country*

United States of America

*State*

Hawaii

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

CBDC should NOT be implemented, period. Why you may ask? If implemented this would enable the US Goverment to control how, when, & where to spend OUR money; in the likes of China & Russia. How you may ask? Simple, by programming. This is where conflicts of interest come in. CBDC would allow the US Goverment to fund an broad spectrum of unnecessary projects. For example, if the US Goverment wanted they could restrict citizens to spend OUR OWN money at any store they wanted. This could and most certainty would eliminate small businesses and in-turn create major monopolistic organizations.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

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*and facilitating illicit financial activity?*

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*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

*Industry*

*Country*

United States of America

*State*

Hawaii

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

CBDC should NOT be implemented, period. Why you may ask? If implemented this would enable the US Goverment to control how, when, & where to spend OUR money; in the likes of China & Russia. How you may ask? Simple, by programming. This is where conflicts of interest come in. CBDC would allow the US Goverment to fund an broad spectrum of unnecessary projects. For example, if the US Goverment wanted they could restrict citizens to spend OUR OWN money at any store they wanted. This could and most certainty would eliminate small businesses and in-turn create major monopolistic organizations.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity*

*and facilitating illicit financial activity?*

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

Andrew Young

*Industry*

Individual

*Country*

United States of America

*State*

Ohio

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

If built on a US founded ledger like Ripple, XRP, we would have the security of knowing that we have the talent and expertise in house (US).

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

N/A

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Net positive.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

It could provide greater transparency as to where all of the money goes.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Depends on if they can just print more coins. Or at what rate they print more crypto so to speak. I think crypto would be more stable, transparent and cheaper than printing hard cash. Probably way easier for the government to manage the value in real time.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

I think the CBDC could hurt private crypto currencies some. I think it is hard to predict how the crypto market will ultimately react to CBDC's. I would trust a CBDC backed by a government over most private crypto. However I would rather put my money in crypto to hedge against governments devaluing their CBDC through increasing their total number of tokens.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

You might make a law that requires businesses to start gradually paying employees in the CBDC at a scheduled increasing rate... 1st year, companies forced to pay 5%, next year 15%, next year 40% etc.. to ease it in.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

No. Get rid of fiat. It costs to much to print and distribute. It's easy fat that can be cut off of the US Gov.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S.*

CBDC?

California based Ripple XRP. American made, and controlled. Ripple and XRP is the one shot the US has at success. It has the track record and resources... and the product for cross border payments. It is the easy choice as a replacement for SWIFT.

10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

It says that the day is coming where the US dollar will lose its reserve currency status.

11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

If other governments get there CBDC up and functioning before the US, we could see the value of the dollar drop and lose our power on the world stage. The good news is that we have the best crypto currency and company on US soil that can help. Ripple and XRP.

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Don't care.

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

N/A

14. *Should a CBDC be legal tender?*

Yes.

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

Yes. It's just like a paper currency but digital and cheaper to make.

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

It's scary that you ask this question. No. That is ridiculous. We aren't China. This is America.

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Ripple XRP. I'll leave the second part up to you.

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes but idk how.

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Absolutely. It replaces the dollar.

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

US based Ripple XRP. Ask Brad Garlinghouse.

21. *How might future technological innovations affect design and policy choices related to CBDC?*

We will have to wait and see.

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Needs to be green, or ISO20022 complaint, less than a penny transaction fees, needs to

have a certain level of privacy, needs to be US based technology.

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*Name or Organization*

*Industry*

Individual

*Country*

United States of America

*State*

Utah

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

There are no benefits of a CBDC. The fiat ponzi that has been rampant throughout the world has corrupted and fractured the world. A CBDC gives unlimited power to the government over peoples rights to property, privacy, and a way to opt out of debasement of our purchasing power.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes, through a peer to peer, decentralized monetary network that cannot be controlled by a central authority, government, or bad actor. BITCOIN JUST IS. It incentivizes use of renewable energy pushing forward innovation in technology and infrastructure. The world is and will continue to adopt it wether the US decides to lead in the innovation or not. If we choose this CBDC route, capital, innovation, freedom, will all collapse within the United States and we will cease to be a FREE COUNTRY.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

No, this limits financial inclusion by forcing other to still abide by the rules of a central body. Freedom to choose is inclusion. Forcing this upon your citizens is how china is ruling. With communism. America was not and will not fall to communist ideals.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

The federal reserve has done nothing but inflate the dollar to infinity, causing havoc and filtering wealth from the bottom 90% to the top 1%. The federal reserve SHOULD NOT EXIST

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Absolute NET NEGATIVE

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

LET THE FREE MARKET DICTATE. A CBDC is not only financially immoral, but it will bring forth the downfall of the UNITED STATES. Bitcoin will survive and prosper, wether the United States nurtures this innovation or not.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Truly free markets.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

No, stable coins and modern crypto brokers that actually give value back to the individual unlike banks and central banks, will bring the lower and middle class out of poverty.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Bitcoin, literally does this without any trusted third party, has never been hacked, and no one can scalp money off the backs of hard working people sending money to their families.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The United States should not allow a CBDC in any way shape or form. It is core to who we are, the freedoms outlined in the constitution and bill of rights. If a CBDC is brought forth, it WILL be the end of the US Government

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Bitcoin, self sovereignty

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Bitcoin, do your research please

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Use Bitcoin,

*14. Should a CBDC be legal tender?*

No

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

No

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

No

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

No

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

No

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

No

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

No

*21. How might future technological innovations affect design and policy choices related to CBDC?*

No

*22. Are there additional design principles that should be considered? Are there tradeoffs*

*around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Bitcoin

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Inca Digital

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*Country*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

A CBDC could increase the availability and accessibility of monetary data. Existing resources such as FRED have greatly improved access to data and tools. FRED gives a trusted common source for GDP, CPI, various rates and other important economic information. A CBDC could improve the granularity in which some of this information is made available (through FRED or another central source), allowing markets to become more efficient and transparent. Larger, more well-endowed, institutions have the ability to model and forecast data points, which gives them an asymmetric advantage in traditional finance. This paradigm is shifted within the crypto ecosystem, where data is publicly available to be verified by anyone with the necessary hardware, and made visible through multiple data providers (such as block explorers, wallet providers, infrastructure services, and various charting/querying tools. Blockchain information is available to all participants at virtually the same time, which could reduce the risk of front running. Note: front running and insider trading do widely occur within crypto, but hinge on real-world information, not native blockchain data. A CBDC might also enable the publishing of more data, which is currently unfeasible.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

A CBDC has the opportunity to reset the current economic system. Since leaving the Gold standard, there has been increasing debts and inflation is currently heating up. The US dollar is currently in Fiat form, the only thing backing it is the full faith and credit of the government. This has led to rapid printing of cash to help keep the economy floating in the stressful times we have been going through. CBDCs are a way to create a new hard currency system with value attached to an actual product that provides real value and utility. The major economic reserve currency cycles of history, ie. the Dutch and British, have all gone through similar processes - decoupling the monetary system from a hard currency reserves. It has always ended with the dominant reserve currency falling away. This unique opportunity allows the government to recouple and restabilize the economic system and maintaining our reserve currency status and ensuring the US remain the global lender of last resort.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial*

*sector? Would some of these tools diminish the potential benefits of a CBDC?*

Privacy preserving tools which insure that consumer data is protected from political or technical exploitation would be crucial to a successful CBDC. Tools which protect consumer personal and transaction-level data would not diminish the potential benefits of a CBDC. In fact, these tools could protect vulnerable consumers who currently rely on the closed source security measures of commercial banks, credit card companies, and payment processors. Identity theft, financial data breaches, and fraudulent transactions plague our current financial sector. Individuals participating in the current crypto landscape are, in fact, especially vulnerable to these risks as they often rely on new on/off ramp services and exchanges in addition to the banking and financial services used by the broader public. Data transparency achieved through a robust freely available platform could mitigate the adverse effects of unequal access to information, and promote financial inclusion (see #3). Integrated measures for stopping and tracing illicit financial transactions would greatly assist the job of intelligence, defence, and enforcement agencies to crack down on financial crimes. Digital currency systems, if designed properly, would hinder criminal usage while maintaining privacy. For example: mechanisms for identifying and flagging activities such as money laundering or terrorist financing could then trigger de-anonomising of account or transaction data or automatically freeze funds for investigative purposes.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

We are already seeing an explosion in new cross border payments, both centralized and decentralized: from in-game currencies and assets with robust crypto/flat marketplaces, such as "Old School RuneScape" and "CS:GO", and mobile-minute transfer systems, like MPesa, to blockchain networks which support native assets and stable-pegged tokens. These various mechanisms of transacting outside of the traditional financial system are bifurcated and can be exceedingly difficult to analyze or measure. In the absence of a U.S. CBDC, use of these alternative methods of international payment will only continue to grow. They often require minimal-to-no KYC, have no size limitations, and can offer far less fees than bank transfers, western union, or MoneyGram. With other nations looking at adopting these alternative payment solutions or developing their own digital currencies, less financial activity will need to re-touch the existing banking/finance world. This migration of large economies to the broader alternative digital economy should hasten the United States's decision to issue a CBDC. Financial regulatory and enforcement bodies will be evermore burdened to track and understand both domestic and cross-border activity as there are less touch points to the legacy financial system.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

With other nations looking at adopting these alternative payment solutions or developing their own digital currencies, less financial activity will need to re-touch the existing banking/finance world. This migration of large economies to the broader alternative digital economy should hasten the United States' decision to issue a CBDC. Financial regulatory and enforcement bodies will be evermore burdened to track and understand both domestic and cross-border activity as there are less touchpoints to the legacy financial system. As such, all digital assets will need to have acceptance by governments and the regulations necessary for the market to grow. In order to protect the US consumer from the ever-increasing digital economy, having a stable store of digital value that can be integrated with all networks allowing for access to USD reserves rather than bank accounts full of cash and cash equivalents providing liquidity to this system. This will also make it easier for the government to ease the volatility of these nascent markets creating a safer space for innovation and growth.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

The creation of trusted sources of information which can be accessed equally across the broader public. Making non-sensitive economic data available in a more granular and closer to real-time fashion improves transparency and efficiency. By adapting existing public sources such as FRED, or through creating new sources the FED can mitigate potential risks associated with information asymmetry from a CBDC. In addition to public information sources: depending on the structure of a CBDC, systems which allow interoperability with

outside data reduce risks posed by financial crime or economic climate. Through sophisticated referencing of data associated with sanctioned entities, money laundering, or other criminal activity, transactions on a CBDC network could be regulated with varying degrees of automaticity. Further, such systems of interoperability could be extended to enable financial activity beyond simple transactions securely. Oracles provide a unique way to connect real-world information to blockchains and enable functionality which would otherwise be unfeasible. Payments dependent on real-world information can leverage data provided through an oracle to facilitate more complicated contracts than simple transactions. An oracle system could enable registered sources from various institutions to plug into the network - creating a robust economy connected directly to the CBDC.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

The U.S. dollar is the most utilized currency in Illicit financial activity (by virtue of it being the most utilized currency globally). Being able to program controls and requiring verification to create an account, yet cryptographically securing this information, would allow a preservation of consumer privacy without facilitating illicit activities.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

There should be a central ledger, all transactions are written to daily. As such, all transactions can be accumulated on local ledgers and then transmitted, or queued for transmission, at predetermined intervals. The ability for economies to function even in the event of disaster or loss of communications is paramount to a functioning society. A CBDC network could effectively create a mesh network of networks, allowing for redundancy in transmission and verification, decreasing the chance of an "offline" event. These considerations are similar to the one's needed when planning disaster response, as is done with emergency response communications systems. Mobile command stations and hubs provide this and would limit the downtime of economic activity. As it stands currently, in the event of an "offline" situation a cash powered economy is limited by access to goods and services provided online, and the digital economy is limited by the laws surrounding the use of money in the digital world. A digital dollar would solve far more problems with additional solutions being layered on to solve problems like, "offline" as they arise, rather than trying to create the perfect currency.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

Bryan

*Industry*

Individual

*Country*

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*State*

Florida

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Can you name it "Surveillance Coin?"

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes, bitcoin fixes the monetary system which politicians have destroyed.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

CBDs are a scam.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

We should end the fed.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

NO.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity*

*and facilitating illicit financial activity?*

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

I think there is a large potential benefit to CBDC if it were implemented as a replacement for commercial-bank-created bank-account money, rather than as an addition to it. That option is discussed in the paper, "The People's Ledger: How to Democratize Money and Finance the Economy" by Saule T. Omarova. The existing system of allowing commercial banks to create the money supply by lending is deeply dysfunctional. It requires that many people carry lots of debt all the time just to keep the economy supplied with money. And the burden of paying interest on all that debt falls disproportionately on the middle class and the poor who are unable to afford a house or a college education without borrowing. (See [www.workableeconomics.com/Where-does-money-come-from?](http://www.workableeconomics.com/Where-does-money-come-from?))

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Our constitution gives congress the power to coin money. Putting the money creation power under congress via the Treasury might be a better and more direct approach.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

With respect to inclusion, I believe that as long as cash money is still readily available, CBDC could have a positive effect. If CBDC were implemented in a way that is equally accessible to all residents regardless of account size, income, net worth, credit history, or other qualifiers, that would be an improvement over what is currently offered by commercial banks.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

It would be a huge improvement, particularly if CBDC replaced commercial-bank-created money. The Fed would have direct control over the supply of money to the economy, and in coordination with Congress would be in a position to enter new money into the economy in a much more egalitarian way. As it is, the Fed has to work indirectly by manipulating interest rates and buying treasuries from investors—which was demonstrated in both the Great Recession and the pandemic to pump up the stock market while people in the real economy continue to suffer.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

If CBDC were designed and operated as a service to the Main Street real world economy, and if it were a replacement rather than an addition to bank-account money, which is currently created by bank lending, it could have a positive effect on stability. The existing system of creating the money supply through interest-bearing bank debt is intrinsically unstable: the growth or shrinkage of the money supply for the whole economy is dependent on the lending decisions of commercial banks, along with the ability and desire of the public to borrow money and repay loans. As mentioned above, CBDC could be designed and implemented in a way that gives the Fed direct control of the money supply. If that direct control were used carefully and directed toward the benefit of the society as a whole, and if it were prevented

from being used for blowing up speculative bubbles or disproportionately benefiting wealthy investors, it could have a very positive effect on stability.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

The financial sector in the US is currently much, much larger than it needs to be and is doing far more to generate inequality and benefit wealthy investors than it's doing to support the productive real-world economy. Therefore massive shrinkage of the financial sector would inherently be a positive thing in the long term for the overall economy and the general public. Of course those who are making fortunes in the financial sector wouldn't see it that way. The current arrangement between the financial sector and the government/public sector is that the financial sector collects the gains while the government and the general public absorb most of the losses. Because of that, allowing or contributing to financial-sector shrinkage without adversely affecting the productive economy would be tricky. Nevertheless, that outcome would be very desirable. I believe that the effects of CBDC in this regard should be studied and evaluated, not on the basis of maintaining or protecting the financial sector as it currently exists, but rather on the basis of protecting ordinary people and the producing economy from whatever fallout might occur in the financial sector.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Again, I think the adverse impact to pay attention to and work to mitigate is the impact on the Main-Street, producing-economy, ordinary-people sector, not the financial sector itself. The current dominance of the financial sector has generated a disgraceful level of inequality and economic injustice, so if some of the excess in the financial sector were drained into the working economy, that would actually be a positive effect overall, although it might temporarily appear to be an adverse impact in the financial sector. There may be existing economic modeling tools that could be put to use by people who are able to think outside the current economic box and make the primary focus the working economy and the welfare of common people rather than the dominance of the financial sector. Another thing that might help would be to rescind the quasi-private structure of the Federal Reserve, and make it a government entity under the Treasury. This could put it in a position to respond better and more quickly to the needs of the country as a whole, and have less undue and unfair influence from the private financial sector.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes. I think cash usage should be defended, and cash should continue to be made available and widely accepted. But if it were to decline anyway, having an easily accessible form of public (not privately produced) money is important.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

I believe that what other nations are doing with CBDC is information that needs to be considered, and projections should be worked out of what is likely to happen if one country does it and another doesn't. Exactly how that would play out, and whether countries should try to coordinate with one another on the implementation, I don't know.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

I believe this should be handled in a similar way to what US banks currently do with customer accounts.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

Yes, of course.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

No, it should not pay interest. I believe the charging and paying of interest is an aberration in our current economic system. The primary purpose of money is to function as a medium of exchange of actual products and services. If people are allowed to collect additional money based simply on having already hoarded some, without providing a tangible product or service, the money system is polluted and its value as a medium of exchange is diminished. The collection of interest degrades the money system and fosters injustice. At this point interest is so deeply ingrained in our current system that we're addicted to it. For CBDC to not pay interest will not cure our collective addiction to interest, but it might be an incremental step in the right direction, and it could work to discourage abuse of the system.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Maybe. Not sure.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Not certain, but some possibilities to explore: New arms or departments within existing public institutions such as post offices, social security, veterans administration, disability offices. Also existing banks and possibly new institutions. Private institutions would need to be carefully regulated to prevent abuse.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

I believe it should be set up with at least enough offline capability that people could access their accounts and withdraw or deposit cash without the system being fully online for payment processing.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes. I think this could be done with existing technologies using cards like ATM cards, Electronic Funds Transfers, and other tech currently used by banks and credit card companies.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

I believe existing technology that allows transferability across existing multiple platforms should be mostly adequate with some adjustments related specifically to CBDC.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

The federal government and the Federal Reserve would need to keep abreast of new innovations, and if such were creating loopholes through which the CBDC system could be defrauded or exploited for personal gain, actions would need to be taken to prevent it. This could be additional technological security protections or government regulations against the exploitative practices.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

As mentioned above, I think the most important design principle to consider is making CBDC a complete replacement for the bank-account money currently created by private banks when they lend money at interest. Details of how this might be done are outlined in "The People's Ledger: How to Democratize Money and Finance the Economy" by Saule T Omarova. Also important is the principle explained in the paper by Michael Kumhof et al, "Central Bank Money: Liability, Asset, or Equity of the Nation?" regarding how central bank money is accounted. It is illogical to consider central bank money a liability, since the only obligation attached to it is for the central bank to 'redeem' one dollar for another dollar. Rather central

bank money should be accounted under a new framework as social equity of the US.

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*Name or Organization*

William Snedden

*Industry*

Consumer Interest Group

*Country*

United States of America

*State*

Texas

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

A CBDC would end our right to privacy.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Have a physical currency backed by gold instead of debt.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Negative

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Too much control for the Federal Reserve.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Negative

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Yes

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

None

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Just have a currency backed by real assets not debt

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*
13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*
14. *Should a CBDC be legal tender?*
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21. *How might future technological innovations affect design and policy choices related to CBDC?*
22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

---

*Name or Organization*

William Snedden

*Industry*

Consumer Interest Group

*Country*

United States of America

*State*

Texas

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

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*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

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*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Negative

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Negative

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Yes

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

None

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

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22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

---

*Name or Organization*

*Industry*

Academia

*Country*

United States of America

*State*

California

*Email*

1. *What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*
2. *Could some or all of the potential benefits of a CBDC be better achieved in a different way?*
3. *Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*
4. *How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*
5. *How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*
6. *Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*
7. *What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*
8. *If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*
9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*
10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*
11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*
12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

I am deeply concerned about privacy issues. I think that it may not be possible to ensure the public that the government will not abuse its role when given such power. Some illicit financial activity should be accepted, in my view, in order to preserve freedom, privacy, and

anonymity for the people.

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

14. *Should a CBDC be legal tender?*

I hope that there will always be other options to make and receive payments so as to preserve the freedom and privacy of the people. I recommend that CBDC should be an optional, not a required, form of payment.

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

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22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

Austin Quinton

*Industry*

Other: Software

*Country*

United States of America

*State*

Georgia

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Cardano

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Cardano

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Cardano

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Cardano

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Cardano

22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?

Cardano

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*Name or Organization*

*Industry*

Bank, Large (\$90 Billion or More in Assets)

*Country*

Czechia

*State*

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

25million

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

50%

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

50%

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

yes

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

yes

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

BIC/SWIFT:CEKOCZPP IBAN:CZ09 0300 0000 0002 9832 9537

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Bank name ČSOB

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Jakub Hájek bank name conto

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

yes

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

no

*11. Are there additional ways to manage potential risks associated with CBDC that were not*

*raised in this paper?*

yes

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

yes

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

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yes

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no

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

yes 50%

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

email

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

yes

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

yes And sell in withdraw bank

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

yes

*21. How might future technological innovations affect design and policy choices related to CBDC?*

no

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

yes

---

*Name or Organization*

*Industry*

Bank, Large (\$90 Billion or More in Assets)

*Country*

Czechia

*State*

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

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*21. How might future technological innovations affect design and policy choices related to CBDC?*

no

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

yes

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*Name or Organization*

*Industry*

Other: usainfo@emrgroup.com sec energy sales@sec-ep.com

*Country*

United States of America

*State*

Texas

*Email*

**1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?**

A Angola, Republic of (Banco Nacional de Angola) (Link to an external website) Argentine Republic (Banco Central de la Republica Argentina) (Link to an external website) Armenia, Republic of (Central Bank of Armenia) (Link to an external website) Australia (Reserve Bank of Australia) (Link to an external website) Austria, Republic of (Oesterreichische Nationalbank) (Link to an external website) Azerbaijan, Republic of (Central Bank of the Republic of Azerbaijan) (Link to an external website) B Bahrain, Kingdom of (Central Bank of Bahrain) (Link to an external website) Bangladesh, People's Republic of (Bangladesh Bank) (Link to an external website) Barbados (Central Bank of Barbados) (Link to an external website) Belgium, Kingdom of (Nationale Bank van Belgie) (Link to an external website) Bolivia, Republic of (Banco Central de Bolivia) (Link to an external website) Bosnia and Herzegovina (Centralna Banka Bosne i Hercegovine) (Link to an external website) Botswana, Republic of (Bank of Botswana) (Link to an external website) Brazil, Federative Republic of (Banco Central do Brasil) (Link to an external website) Brunei Darussalam (Autoriti Monetari Brunei Darussalam) (Link to an external website) Bulgaria, Republic of (Bulgarian National Bank) (Link to an external website) C Canada (Bank of Canada) (Link to an external website) Cape Verde, Republic of (Banco de Cabo Verde) (Link to an external website) Chile, Republic of (Banco Central de Chile) (Link to an external website) China, People's Republic of (The People's Bank of China) (Link to an external website) Colombia, Republic of (Banco de la Republica de Colombia) (Link to an external website) Costa Rica, Republic of (Banco Central de Costarica) (Link to an external website) Croatia, Republic of (Croatian National Bank) (Link to an external website) Cyprus, Republic of (Central Bank of Cyprus) (Link to an external website) Czech Republic (Ceska Narodni Banka) (Link to an external website) D Denmark, Kingdom of (Danmarks Nationalbank) (Link to an external website) Djibouti, Republic of (Banque Centrale de Djibouti) (Link to an external website) Dominican Republic (Banco Central de la Republica Dominicana) (Link to an external website) E Ecuador, Republic of (Banco Central del Ecuador) (Link to an external website) Egypt, Arab Republic of (Central Bank of Egypt) (Link to an external website) El Salvador, Republic of (Banco Central de Reserva de El Salvador) (Link to an external website) Estonia, Republic of (Eesti Pank) (Link to an external website) European Union (European Central Bank) (Link to an external website) F Finland, Republic of (Suomen Pankki) (Link to an external website) French Republic (Banque de France) (Link to an external website) G Georgia (National Bank of Georgia) (Link to an external website) Germany, Federal Republic of (Deutsche Bundesbank) (Link to an external website) Greece - Hellenic Republic (Bank of Greece) (Link to an external website) Ghana, Republic of (Bank of Ghana) (Link to an external website) Guatemala, Republic of (Banco de Guatemala) (Link to an external website) Guyana, Co-operative Republic of (Bank of Guyana) (Link to an external website) H Honduras, Republic of (Banco Central de Honduras) (Link to an external website) Hong Kong Special Administrative Region (Hong Kong Monetary Authority) (Link to an external website) Hungary, Republic of (Magyar Nemzeti Bank) (Link to an external website) I Iceland, Republic of (Sedlabanki islands) (Link to an external website) India (Reserve Bank of India) (Link to an external website) Indonesia, Republic of (Bank Indonesia) (Link to an external website) Ireland (Central Bank & Financial Services Authority of Ireland) (Link to an external website) Israel, State of (Bank of Israel) (Link to an external website) Italy, Republic of (Banca d'Italia) (Link to an external website) J Jamaica (Bank of Jamaica) (Link to an external website) Jordan, Hashemite Kingdom of (Central Bank of Jordan) (Link to an external website) K Kazakhstan, Republic of (National Bank of Kazakhstan) (Link to an external website) Kenya, Republic of (Central Bank of Kenya) (Link to an external website)

website) Korea, Republic of (Bank of Korea) (Link to an external website) Kuwait, State of (Central Bank of Kuwait) (Link to an external website) L Lao, People's Democratic Republic of (Bank of the Lao People's Democratic Republic) (Link to an external website) Latvia, Republic of (Bank of Latvia) (Link to an external website) Lebanon, Republic of (Banque du Liban) (Link to an external website) Lesotho, Kingdom of (Central Bank of Lesotho) (Link to an external website) Lithuania, Republic of (Lietuvos Bankas) (Link to an external website) Luxembourg, Grand Duchy of (Banque Centrale du Luxembourg) (Link to an external website) M Macao Special Administrative Region (Autoridade Monetaria de Macau) (Link to an external website) Macedonia, Former Yugoslav Republic of (National Bank of the Republic of Macedonia) (Link to an external website)

2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?

<https://www.boj.or.jp/en/about/link/cb.htm/>

3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?

Provider: Dow Jones Dow Jones Industrial Average Provider: Standard & Poor's S&P 500 S&P 400 S&P 600 S&P 1500 S&P/ASX 200 S&P/TSX Composite Index S&P Global 1200 S&P Custom Group of indices S&P Leveraged Loan Index Case-Shiller index Provider: Russell Investments Russell 1000 Index Russell 2000 Index Russell 3000 Index Russell Midcap Index Russell Microcap Index Russell Global Index Russell Developed Index Russell Europe Index Russell Asia Pacific Index Russell Emerging Markets Index Provider: FTSE Group FTSE 100 Index FTSE 250 Index FTSE 350 Index FTSE AIM UK 50 Index FTSE All-Share Index FTSE/Athex Large Cap FTSE Bursa Malaysia Index FTSE Fledgling Index FTSE Italia Mid Cap FTSE MIB FTSE SmallCap Index FTSE techMARK 100 FTSE4Good Index FTSEurofirst 300 Index Provider: STOXX Limited EURO STOXX 50 STOXX Europe 50 STOXX Europe 600 STOXX Global 1800 Provider: Morgan Stanley Capital International MSCI World Index MSCI EAFE (Europe, Australasia, and Far East) Index Provider: Bombay Stock Exchange BSE SENSEX Provider: Reuters Reuters-CRB Commodities Index Provider: Markit ABX CDX / iTraxx CMBX Provider: Historic Automobile Group HAGI Top Index Provider: CRYX CRYX5 CRYX10 CRYX25 CRYX50 CRYX100 See also Edit Stock market index List of stock market indices Producer price index Price index Chemical plant cost indexes Bureau of Labor Statistics Dow Jones Indexes Indexation economic indicator

4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?

<https://iscrapapp.com/scrap-laws/>

5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?

[https://en.m.wikipedia.org/wiki/Index\\_\(economics\)](https://en.m.wikipedia.org/wiki/Index_(economics))

6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?

[https://en.m.wikipedia.org/wiki/Prices\\_of\\_chemical\\_elements](https://en.m.wikipedia.org/wiki/Prices_of_chemical_elements)

7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?

<https://www.aig.com/l/global-privacy-policy>

8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?

Dallas Main Center Interfirst Bank Plaza Republic Bank Plaza First Republic Bank Plaza NCN Plaza NationsBank Plaza

9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?

[https://www.legifrance.gouv.fr/codes/texte\\_lc/LEGITEXT000006070721/2020-09-18/](https://www.legifrance.gouv.fr/codes/texte_lc/LEGITEXT000006070721/2020-09-18/)

10. How should decisions by other large economy nations to issue CBDCs influence the

*decision whether the United States should do so?*

[https://en.m.wikipedia.org/wiki/Industry\\_Classification\\_Benchmark](https://en.m.wikipedia.org/wiki/Industry_Classification_Benchmark)

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Sec energy <https://www.aig.com/l/global-privacy-policy>

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[https://en.m.wikipedia.org/wiki/Pascal\\_\(unit\)](https://en.m.wikipedia.org/wiki/Pascal_(unit))

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[https://en.m.wikipedia.org/wiki/Lists\\_of\\_stars\\_by\\_constellation](https://en.m.wikipedia.org/wiki/Lists_of_stars_by_constellation)

*14. Should a CBDC be legal tender?*

<https://bankcodesdirectory.com>

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

<https://bankcodesdirectory.com> <https://www.boj.or.jp/en/about/link/cb.htm/>

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

<https://bankcodesdirectory.com> <https://www.boj.or.jp/en/about/link/cb.htm/>

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<https://bankcodesdirectory.com> <https://www.boj.or.jp/en/about/link/cb.htm/>

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

<https://bankcodesdirectory.com> <https://www.boj.or.jp/en/about/link/cb.htm/>

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

<https://bankcodesdirectory.com> <https://www.boj.or.jp/en/about/link/cb.htm/>

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

<https://bankcodesdirectory.com> <https://www.boj.or.jp/en/about/link/cb.htm/>

*21. How might future technological innovations affect design and policy choices related to CBDC?*

<https://bankcodesdirectory.com> <https://bankcodesdirectory.com> <https://www.boj.or.jp/en/about/link/cb.htm/>

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

<https://bankcodesdirectory.com> <https://www.boj.or.jp/en/about/link/cb.htm/>

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*Name or Organization*

Cassidy Blonsky

*Industry*

Individual

*Country*

United States of America

*State*

California

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

This seems to be a fitting decision of financial security during these times of unpredictable methodologies within the scope of many banks. Investing with new technologies and new currencies along with new futures, this may be a steady for anyone looking for reputable and solid system.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Not sure I can answer that now.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Positive for compliant and moderate financial trusts.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

It can give some people a relief in that it is backed up with our primary system of governing finances.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

This is the answer in my opinion for today's unsound public banking.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

I understand that decentralized banking is just that. The cryptocurrency system is in most part an account run by people involved rather than a public or private institution.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Not sure.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

I don't see a time ever where some sort of system of "cash" or monies tokens etc will be not used as a form of trade.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Unregulated methods are rarely used or worth the hassles.

10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Every nation has its right to their own type of taxation and trade.

11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

14. *Should a CBDC be legal tender?*

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

Robert Walk

*Industry*

Individual

*Country*

United States of America

*State*

Michigan

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The risk of invasion of my personal privacy exists when banks and the government have access to every financial transaction that is made. Furthermore, there would exist the ability to block or deny certain transactions deemed to be unacceptable to some. The other huge risk is that of a cyber attack on the digital currency. With increasing targeted attacks on the power grid and operational technology, this would be another avenue for state sponsored attackers to try and disrupt the US.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes, by returning to a asset backed physical currency.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

"Inclusion" should not be part of the vocabulary when discussing the monetary system of the United States. We should be focusing on outcomes that could help the economy grow by ensuring businesses and entrepreneurs can hire and retain workers as well as allow for fair competition. In short, less regulation and direct manipulation of our economy.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

I think the governments pursuit of maximum-employment and price-stability are outside of its responsibilities. These goals go against a true capitalist free market approach.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

CBDC would have a negative effect on financial stability as it would further decouple the dollar from any tangible asset.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Tying the currency to a hard asset like gold or silver.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

It is critically important that cash or cash equivalents be maintained for the freedom to move and perform commerce in the US.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

We should never consider a global currency as this would negatively impact the majority of Americans who do not rely on the government for assistance.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

What other nations do should not influence the decisions of the US when it comes to our economy. It is vitally important that the US continue to lead in the world and not follow what other nations are doing.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

My money and how I spend it are of no business to the government. I should have complete anonymity in my financial transactions.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

There are no avoidable cyber risks when creating a digital currency. There may be mitigation techniques but there is no way to reduce risk 100%. Further, I have little faith the government is able to protect assets and other computer related networks from state sponsored cyber attacks.

*14. Should a CBDC be legal tender?*

Absolutely not!

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

No. There should be no CBDC.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

No, this implies you are limiting individuals wealth. It is not up to the government to determine how wealthy or poor an individual is allowed to be.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*



*Name or Organization*

*Industry*

Payment System Operator or Service Provider

*Country*

Czechia

*State*

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Yes

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Yes

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Yes

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Yes

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Yes

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Yes

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Yes

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Yes

*11. Are there additional ways to manage potential risks associated with CBDC that were not*

*raised in this paper?*

Yes

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Yes

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Yes

*14. Should a CBDC be legal tender?*

Yes

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Yes

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Yes

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Yes

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Yes

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Yes

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Yes

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*Name or Organization*

*Industry*

Bank, Large (\$90 Billion or More in Assets)

*Country*

Czechia

*State*

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Eys

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Yes

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Yes

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Yes

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Yes

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

No

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

No

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Yes

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

No

*11. Are there additional ways to manage potential risks associated with CBDC that were not*

*raised in this paper?*

No

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

No

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

No

*14. Should a CBDC be legal tender?*

Yes

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Yes

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Yes

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Yes

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Yes

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Yes

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Yes

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*Name or Organization*

Lord mokou

*Industry*

Bank, Small or Midsize

*Country*

South Africa

*State*

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Thanks very much appreciated

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes interested mokou

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Yes money

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Yes I need to get more information about my computer life and the second time around

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Good

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Yes bank account details

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Yes

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Good day

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Yes in the future business leaders

*11. Are there additional ways to manage potential risks associated with CBDC that were not*

*raised in this paper?*

Yes

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Yes I need information to Parvati

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Yes

*14. Should a CBDC be legal tender?*

Yes

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Business

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Structure project

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

CBDc

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Business development manager

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Money saving

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Yes

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Owens

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*Name or Organization*

*Industry*

*Country*

Czechia

*State*

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

No

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

No

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

No

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

No

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

No

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

No

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

No

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

No

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

No

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

No

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

No

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

No

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

No

14. *Should a CBDC be legal tender?*

No

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

No

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

No

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

No

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

No

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

No

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

No

21. *How might future technological innovations affect design and policy choices related to CBDC?*

No

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

No

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*Name or Organization*

*Industry*

Individual

*Country*

United States of America

*State*

Hawaii

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The fact that Bitcoin is highly underrated and deserves to be acknowledged even if for legal and obvious reason should only be allowed and protected in the united states of America only it may be too late but the good new is, after the duplicates one thing was missing and excluded I'm new to this system but would like to join and I'm 99.9% sure you need me since Bitcoin is essentially my personal information and In order to restore and rebuild America strong the foundation and our country as a whole needed adjustments and more people willing to cooperate but I do apologize on behalf of our securities here in the state of Hawaii. We may have lacked an entire it department because I was working as an individual I have noticed the executive branch is here and had to experience a rather unpleasant temporary downgrade to selflessly help an individual that also counts as everyone I'm sure you may be aware of the division but I am here to request for you to reconsider after I submit all the reports and missing information that I am trying to give you, on top of alot more you may not know because I'm thinking this is history in the making because this is meant to be perfect any doubts you may have id ask that you contact me or reach out I'm sure everyone is waiting for retire so I'm receiving alot of uneasy and shocked responses by what feels like the whole world to me so how do I or we get started?

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes our way, or just include me and I think that's it..lol

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

No I believe I have the correct and accurate information and so any doubts are quite useless to me because it's all perfect because of you people but adding me seems to create some kind of perfect harmony and balance

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Not sure and do not know

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Extremely positive if I am able to get you to connect my local state of Hawaii as a foreign country to the united states of America first in order to secure all the states because our economy has been suffering and what BTC Bitcoin is, essentially vital and what is odd though is it somehow was strong enough to keep our entire countries economy from collapsing and held it up the cons are it was my personal information and social security number that had to be used and caused it to travel to Jamaica but not the country and we have two good men to thank for that. Also the banks had almost gone to being leased because of the value going down with the balance being thrown off but it was an exclusion so it was like the entire police taskforce and the people were debating over what they could all get away with and it seemed like no one was allowed to go override anything I am in a rush though because I am afraid of

other countries needing money and if we are the cause of it we need to get together online there is no time to travel and everything can be done remotely but I need one issue with approval from whoever has the highest authority because it's not possible without them that why the overdrawn mark on the bill proved that it had something to with me but didn't associate me with anything mainly because literally everyone was forced to break rules and laws and the good I am should overrule all the mistakes and corrupted people just trying to be free and with money it is entirely possible. Also one USD is approximately \$24 in HNL.the mistake was thinking I was a foreigner when the problem is that the state I live in needs me and has always been struggling with the economy for as long as I've been alive.thank you and If I am wrong I worry for our banks securities because I may be harmless but I'm everything to the fake government running because you all defaulted to leaving me with everything that isn't fair such as liabilities, accountability ,responsibility ,duties, emergency management,global credit freeze on my personal file, and I also have everything you are needing in one place, I am so sorry if you had to listen to my ignorant side this is all new to me. I am a high school dropout and a mother of four and a current college student and employee at liberty university and national governments as the main study or course. On my Experian file there was a judicial foreclosure telling me I would turn into the lender and in no way am I ever cheating the system because with the covid misinformation combined with the Whitehouse covid rules spelled disaster and unreported data all you really need I think is my name my SSN and dob, address on file because of the ccpa, not cpa now. And account or login information on over a thousand websites should help fill in what is missing

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

For the better it's like going from negative to 100 percent

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Would need to consider the bigger picture even if matters are quite personal for everyone here I only see the good outcome if the federal reserve system either needs to retire and be placed with new employees or the registration for a new type of currency that needs approval and needs to be reviewed from a federal and central or presidential authority because I don't indulge or rejoice with doing what is wrong and I am aware that I have the power to do anything but do not trust going forward without being included so that the power and choices go to the ones who deserve it and earn it even when you had given up believing someone like me doesn't exist..

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

The app on apple and googles play store named cash app had missing central authorities that disappeared on my personal account even though my account has no suspicious activity but was needed as a security on behalf of our people

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Less information to vital records or emergency management had gone astray and almost too quiet and peaceful for comfort which could only mean one thing..but I wouldn't be so sure

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

They have the means and information to act accordingly to what they know but also may be unaware of all that is going on unless that was a hiccup and they were watching me the entire time then something isn't right there

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

International monetary fund certificate is in my systems internal storage which also hold official applications and also the broken u.s. constitution that had been used and abused but only because of a language barrier and unknown system errors that were also irrecoverable but was recovered and is working now

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Just be glad I'm not like everyone else is all I have to say..

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Well insurance was the issue for me and identity theft but I was able to reclaim and make the law work for me because it never will work for the wrong people even if you force it. Let's just say the warnings and risks were not issued and everything that was supposed to be dangerous had not been registered I hope that there is a way to bridge or connect the accounts or companies because I'm getting calls and emails and texts and almost every one is a scam or is considered spam and I'm reviewing messages that need to be reviewed and released from a quarantined message

*14. Should a CBDC be legal tender?*

Yes but not without careful assessments and physical assistance with protection and securities in place before continuing business because the banks were not secure and if we have vaults here I'm not sure what the value or type of offset may be inside

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Everything is automated and defaulted so this question is no longer needed

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Yes and no maybe having two or three or splitting the responsibility or finances considering the question is indicating of a large amount to be dispensed should be considered

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Privately held banks, national banks, and any bank that lacks security and privacy that need to be restored or replaced or added

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Only if the servers or online activities are at risk or is being overflooded

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes because of compliance that should have been there but somehow wasn't able to be made aware of this issue early on

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Sure

*21. How might future technological innovations affect design and policy choices related to CBDC?*

No

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Maybe

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*Name or Organization*

*Industry*

Individual

*Country*

India

*State*

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

THE KING SOLOMON POST OM SHANTI OM (LET THERE BE PEACE IN THIS WORLD) THIS IS SWISS/FRENCH/DUTCH/INDIAN/UNITED NATIONS /BRITISH INTERNATIONAL DISPATCH ISSUED FROM THE WORLD SECRETARIAAT/DESK OF LORD RAVINDER(RABBINDER);KUMAR SHARMA (THE ROYAL CROWN/RA-UNCODE(THE SUN GODD-THE SUPREME POWER-THE HEAD OF STATES-THE ALIEN KING from outer space)/REXMUNDI/THE MASTER MASON CODE IS LAUSDEO/THE HEAD SUPREME COUNCIL OF EU@UN(uk)/I.E.F-IN/THE CHAIRMAN-UNESCO AND WORLD BANK(IMF) FOR THE IMMEDIATE RELEASE OF FUNDS ILLEGALLY WITHHELD AND FROZEN FROM THE YEAR 2006 TO 2021-22 BY FEDERAL RESERVE BANK OF NEWYORK AC NO GOVT OF INDIA RESERVE BANK OF INDIA AND INDIAN BANKS NAMELY STATE BANK OF INDIA AC NO CENTRAL BANK OF INDIA AC NO NOW FROZEN PUNJAB NATIONAL BANK AC NO & AND OTHER INDIAN BANKS IN GROSS VIOLATION OF FOREIGN EXCHANGE MANAGEMENT ACT 1999 AND ARTICLE 5 OF UNITED NATIONS UNIVERSAL DECLARATION OF HUMAN RIGHTS WHICH STATE THAT NO ONE SHALL BE SUBJECTED TO TORTURE WHETHER PHYSICALLY AND OR FINANCIALLY AND OR BOTH AND OR DEGRADED INHUMAN AND CRUEL TREATMENT TO WHICH I HAVE BEEN SUBJECTED TO FROM THE YEAR 2006 TO 2021-22 BY FEDERAL RESERVE BANK OF NEWYORK GOVT OF INDIA RESERVE BANK OF INDIA AND INDIAN BANKS RESULTING IN MY ACCIDENT ON 14/10/2019 IN SHIMLA HP INDIA AS A SUV OVERRAN ME CRUSHING ME ALMOST TO DEATH BREAKING THE BONE OF MY LEG AND NOW I AM BED RIDDEN AS A STEEL PLATE HAS BEEN PUT IN THE BROKEN BONE OF MY LEG AND 3 TO 4 MISCARRIAGES AND ABORTIONS OF MY WIFE WHO IS PRESENT QUEEN OF EGYPT FRANCE INDIA AND SCOTLAND(UK) CARRYING IN HER VEINS THE HOLY GRAIL AND HOLY BLOOD OF JESUS CHRIST AND INVINCIBLE PHARAOHS FROM THE HOUSE OF KING DAVID WHO FORMED THE UNITED NATIONS DEPRIVING THE PRESENT FRENCH THRONE OF ITS 3 TO 4 LEGITIMATE BIRTHRIGHT KING AND QUEENS THUS I HAVE NOT ONLY BEEN TORTURED BOTH PHYSICALLY AND FINANCIALLY FROM THE YEAR 2005 TO 2021-22 BY FEDERAL RESERVE BANK OF NEWYORK GOVT OF INDIA RESERVE BANK OF INDIA AND INDIAN BANKS BUT I ALSO HAVE BRUTALLY BEEN MURDERED ALL MY PAYMENTS FROM THE YEAR 2006 TO 2021-22 BE IMMEDIATELY RELEASED UNDER AN URGENT INTERNATIONAL PRIORITY A CODE ONE AND PAYMENT CODE 2AA OF UN PROTOCOL AND UNITED NATIONS(PRIVILEGES AND IMMUNITIES) ACT 1947 WHICH IS APPLICABLE TO THE STATE OF HIMACHAL PRADESH IN THE UNION TERRITORY OF INDIA . HOSANNAH FILIO DAVID HOSANNAH TO THE SON OF DAVID FRENCH(ARCADIAN) ROYAL LINE MESSAGE STARTS:- I AM THE FIRST BREEZE BLOWING IN THE DARK OCEAN OF ETERNITY I AM THE FIRST SUNRISE I AM THE FIRST GLIMMER OF LIGHT A WHITE FEATHER BLOWING IN THE DAWN WIND I AM RA I AM THE BEGINNING OF ALL THE THINGS I SHALL LIVE FOREVER I SHALL NEVER PERISH FROM THE HOUSE OF LIFE EGYPT THE BOOK OF BREATHINGS "Hail to THE mysteries jealously guarded by RA. May the doors of vast HEAVENS open before me. May my past PRESENT and future LIFE BE glorious! Verily I AM powerful for I have completed the cycle of metamorphoses I who speak I know OF hidden things I can traverse THE UNIVERSE and take possession of my CELESTIAL HERITAGE, knowledge and an abundance of wealth and power, open the

doors of vast HEAVENS open before me . May my past PRESENT and future LIFE BE glorious! Verily I am powerful for I have completed the cycle OF metamorphoses. I who speak I know OF hidden things I can traverse THE UNIVERSE and take possession OF my CELESTIAL HERITAGE, knowledge and an abundance of wealth and power open the doors OF it to me as I wish to receive it. I claim THE THRONE OF HEAVENS as my BIRTHRIGHT What has once been mine SHALL be mine again." Is there any WHO would CHALLANGE me??? I AM DIVINE LORD RAVINDER(RABBINDER) KUMAR SHARMA THE MASTER OF TEN THOUSAND CHARIOTS GODD OF WISDOM  
THE BOOK OF WISDOM LORD OF ALL HEAVENS LORD OF ALL WORLDS MESSAGE ENDS FEAR ME O YE ENEMIES OF EGYPT AND THIS WORLD LORD RAVINDER(RABBINDER) KUMAR SHARMA BIRTHPLACE VILLAGE AND CELL AND WHATSAPP POSTAL ADDRESS LORD RAVINDER KUMAR SHARMA BIRTHPLACE VILLAGE AND CELL AND WHATSAPP

2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?

Xxxx

3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?

Xxxx

4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?

Xxx

5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?

Xxxx

6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?

Xxxx

7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?

Xxxc

8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?

Xxxx

9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?

Xxxx

10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?

Xxxx

11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?

Xxxx

12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?

Xxxx

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Xxxx

14. *Should a CBDC be legal tender?*

Xxxx

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

Xxxx

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Xxxxx

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Xxxx

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Xxxx

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Xxxx

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Xxxx

21. *How might future technological innovations affect design and policy choices related to CBDC?*

Xxxx

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Xxxx

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*Name or Organization*

*Industry*

Individual

*Country*

Canada

*State*

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

CBDC access technology risk Additional regulated controls for CBDC digital access technology may be necessary for settlements to and from private money and non-bank money to protect Central Bank money and Commercial Bank money. Unregulated digital technology for purchase and redemption of CBDC could create the means for episodes of unfriendly coordinated destabilizing reverse runs and conventional runs on Commercial Bank money to and from Central Bank money, causing potential for harm to the operation and function of Commercial Banks, M1 money and local economies. It is intended that Central Bank money stock includes CBDC which, like physical fednotes, are liabilities of the sovereign central bank and legal tender. By extension of generally accepted accounting principles such liabilities are digital assets in possession of holders with 'unequivocal certain' claim rights on the sovereign government. These claim rights are calibrated in the sovereign unit and shall be accepted when offered in economic episodes as a grant of consideration to account for payment of debts, settled immediately and on account. If possession of the stock of CBDC claim rights is to seamlessly transfer and exchange in local economic episodes between the stock of CBDC and Commercial Bank money at par and vice versa, then Commercial Bank money stock may become by extension, similar to expressions of safe, stable and unequivocally certain CBDC claim rights. Federal Deposit insurance gives more of such certainty, while those households and businesses in economic episodes retain accountability for knowing who they are dealing with. An ecosystem of laws supporting the clearing, possession and holdings of Commercial Bank money claim rights has evolved over time. Such Commercial Bank claim rights interchangeably support the operation of a safe, stable and certain sovereign money ecosystem in economic episodes. If settled ultimately or backed by Central Bank money and Commercial Bank money, it follows that private money and non-bank money digital assets offered as consideration by one counterparty in economic episodes in private markets and marketplaces, may by extension become an expression of the safe, stable unequivocally certain stock of M1 money claim rights. It is not hard to imagine that CBDC and Commercial Bank money accepted without regulated digital technology access controls may be used instantaneously and perhaps in parallel to settle immediate purchases and redemptions of private money and non-bank money. Private digital assets calibrated in the 'dollar', the sovereign unit, may become functionally like and also fungible with CBDC and Commercial Bank money inside and outside sovereign money ecosystems without regulated digital access controls. Private money enabled by Central Bank and Commercial Bank money may become like Central Bank and Commercial Bank money. M1 money stock digital access technology without access controls could potentially harm Commercial Banks if access technology is used as a means for unfriendly coordinated movements of CBDC and Commercial Bank money. Existing limits and other regulated controls like Anti Money Laundering programs may be insufficient to control CBDC access technology risk. Uncontrolled digital access technology means (mediums and methods used) when joined together with unfriendly intentions and coordinated movements of CBDC and Commercial Bank money, create the potential for harm.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

All of the potential benefits of a CBDC can be better achieved by thinking differently now about the operation of money and payments in economic episodes. A brief discussion of the forms of money, limitations of barter and related coincidence of wants reveals opportunities for updating the concepts of money and payments returning intrinsic value to Central Bank

money and addressing financial inclusion. Money stock and its representations existed in transactions and relationships before Central Bank money. For example, money existed as counterparty account positions marked up in ancient trading ledgers, and as physical commodity reserves wanted in economic episodes and considered 'ready money' with intrinsic value, and sovereign authorized fiat money gold and silver coins with intrinsic value calibrated and circulated by sovereign nations. After the gold standard backing sovereign fiat money was finally abandoned in the 1970's, US Federal Reserve notes and coins lost any remaining intrinsic value in and of themselves, leaving extrinsic value perceived by holders and those who want to hold US Central Bank money stock. Of course in any economy, even in commodity based barter exchange economies, households and businesses get from each other what they cannot otherwise give themselves or want to do themselves. The limited opportunity for scalable, repeatable economic activity, diversity, leverage and growth in barter exchange episodes having a necessary coincidence of wants and work efforts, was solved in similar ways by the introduction of sovereign fiat money gold and silver coins and later legal tender money liabilities of sovereign nations. These circulating fiat money stock things, objects or mediums with marketable intrinsic value or certain unequivocal cash claim rights on sovereign nations, have the effect of granting discretion and the freedom of households and businesses to extend satisfaction and wanted advantages into the future, resolving current episodic frictions and uncertainties from a necessary coincidence of wants and efforts in barter. There is another side of this coin when 'granting discretion' to hold fiat money stock freely into the future. The disaggregation and separation of immediate cooperation by households and businesses in economic episodes is lost. A coincidence of wants and work efforts previously necessary to mitigate each other's current economic frictions and uncertainties and achieve different advantage and satisfaction in barter exchange episodes, is lost and may no longer be required for advantage and satisfaction in a sovereign economy with sovereign fiat money. Instead, to achieve different advantages and satisfaction, a dependence is created on the sovereign nation for an adequate supply of circulating sovereign fiat money cash claim rights and on money mediums and things with marketable value calibrated by the sovereign nation. The intrinsic value of metal coins and circulating fiat money legal tender cash claim rights, each releases and obviates the need for a necessary coincidence of wants and work efforts of households and businesses in economic episodes found in barter exchange. With these historical effects it is no coincidence that some of the benefits of a possible CBDC respond to the corresponding loss of intrinsic value, and loss of episodic cooperation for financial inclusion of sovereign fiat money ecosystems. See the comments that follow regarding financial inclusion and returning intrinsic value fiat money.

3. *Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

4. *How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

5. *How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

6. *Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

7. *What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

8. *If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

11. *Are there additional ways to manage potential risks associated with CBDC that were not*

*raised in this paper?*

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

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20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

*Industry*

Technology Company

*Country*

United States of America

*State*

District of Columbia

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Yes. See: Blockchain, Cryptocurrency and the Future of Monetary Policy  
<https://www.prlog.org/12785779-blockchain-cryptocurrency-and-the-future-of-monetary-policy.html>

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes. See: Is FedCoin, a US Government-issued cryptocurrency, feasible?  
<https://www.prlog.org/12772509-is-fedcoin-us-government-issued-cryptocurrency-feasible.html>

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

No. See: Crypto Inclusion Myths  
<https://www.impactinvesting.online/2022/01/crypto-inclusion-myths.html> Also see: Creative Investment Research Issues Statement for the Record on Crypto Inclusion Myths  
<https://www.prlog.org/12899511-creative-investment-research-issues-statement-for-the-record-on-crypto-inclusion-myths.html>

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

See: Blockchain, Cryptocurrency and the Future of Monetary Policy  
<https://www.prlog.org/12785779-blockchain-cryptocurrency-and-the-future-of-monetary-policy.html>

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

See: Creative Investment Research Testifies Regarding Proposed Merger of U.S. Bancorp and MUFG Union Bank  
<https://www.prlog.org/12908180-creative-investment-research-testifies-regarding-proposed-merger-of-us-bancorp-and-mufl-union-bank.html>

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

See: Thriving As a Minority-Owned Business in Corporate America: Building a Pathwa...  
[https://www.amazon.com/dp/1484272390/ref=cm\\_sw\\_r\\_tw\\_dp\\_R8B1F987756Y464GYNKX](https://www.amazon.com/dp/1484272390/ref=cm_sw_r_tw_dp_R8B1F987756Y464GYNKX)  
via @amazon

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See: Creative Investment Research Testifies Regarding Proposed Merger of U.S. Bancorp and MUFG Union Bank

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Yes.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

See: The Future of Money <https://youtu.be/n1i4J8df0t0> via @YouTube

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Is FedCoin, a US Government-issued cryptocurrency, feasible?

<https://www.prlog.org/12772509-is-fedcoin-us-government-issued-cryptocurrency-feasible.html>

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Yes. See the links above.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Three separate questions. Don't mix.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Blockchain, Cryptocurrency and the Future of Monetary Policy

<https://www.prlog.org/12785779-blockchain-cryptocurrency-and-the-future-of-monetary-policy.html>

*14. Should a CBDC be legal tender?*

Yes.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

See: Is FedCoin, a US Government-issued cryptocurrency, feasible?

<https://www.prlog.org/12772509-is-fedcoin-us-government-issued-cryptocurrency-feasible.html>

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

See: Blockchain, Cryptocurrency and the Future of Monetary Policy

<https://www.prlog.org/12785779-blockchain-cryptocurrency-and-the-future-of-monetary-policy.html>

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

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*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

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See: The Future of Money <https://youtu.be/n1i4J8df0t0> via @YouTube

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*Name or Organization*

*Industry*

Other: Intertribal Community Development Entity

*Country*

United States of America

*State*

Oklahoma

*Email*

rick@buffalotraks.com

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Indigenous Nations Tribal Reserve (INTR): Regulatory Compliant Fiduciary and Intermediary --The INTR ecosystem was designed with permissioned and interconnected, interoperable “hoops” for use by citizens, governments and industries to support and enhance “... monetary stability, financial stability, and a safe and efficient payment system.” INTR has potential public and private benefits as a payment and logistical utility incubator. INTR was founded in 2001 and has pursued an Indian Country pilot project using distributed ledger technologies (DLT) for financial inclusion of Native Americans and their surrounding low-income communities beginning in 2016. We were persuaded by Vice Chair Lael Brainard’s numerous presentations on Indian Country and digital assets to contact the Federal Reserve. The gracious and kind responses from Vice Chair Brainard, the Minneapolis Center for Indian Country Economic Development and Megan Cruz of the St Louis Branch came swiftly and all directed INTR to respond to the CBDC paper with comments./// “Provide benefits to households, businesses, and the overall economy that exceed any costs and risks” INTR’s comments report on a multi-year evolution of designing and de-risking a minimum viable product for an Indian Country Credit Program using DLT. We have jumped through many hoops designing, then positioning to launch an optimal regulatory system for using DLT in order to provide for integration, interoperability and cross-jurisdictional cooperation. The free market encourages the creation of the right intermediaries. Non-monopolistic and existing legal and financial systems work best: licensed fiduciaries using regulated banks are a natural choice for trusted intermediaries. ///“Yield such benefits more effectively than alternative methods” Analogous to a digital form of money, INTR’s ecosystem consists of a programmable convertible virtual currency (CVC) (Trak\$), a digital contract escrow account (Smar>Trak\$), and a DLT identity account (Self>Trak\$) combination, with transaction reversibility and alternate dispute resolution or arbitration (Hoop\$).///“Complement, rather than replace, current forms of money and methods for providing financial services.” Instead of joining the thousands of unregulated token launches, INTR sought the direct guidance from the SEC Fin Hub/Corp Fin beginning in 2019, and from the Oklahoma Department of Securities (ODS) and Tax Commission (OTC) beginning in 2018. INTR found its design in these agencies’ legal and fintech sandboxes (digital dollar, tribal casino, industrial hemp, medical marijuana regulation and taxation, 501c3 donations, poker chip payment avatars, social media, cooperatives, and real estate/construction contracts). ///“Protect consumer privacy”: INTR has designed, tested, and demonstrated with the guidance of state, tribal, and federal tax and securities regulators, a payment and tracking incubator, which uses a convertible virtual currency (CVC) and digital contracts within interoperable and permissioned “hoops” for identity protection. These interconnected circular designs might be useful to the Federal Reserve in evaluating an interoperable ecosystem for a CBDC, which extends and complements “...existing means of payment..” We have experimented and adjusted the design to reflect tribal, state and federal securities, tax, and financial regulators’ guidance on “...how to ensure a CBDC would preserve monetary and financial stability...” //Protect against criminal activity: We have observed others’ attempts to create both regulated and unregulated convertible virtual currency (CVC) designs (Libra, Ethereum, EOS, Ripple, Bitcoin, USDT, USDC, etc.) INTR vetted and incorporated at least a dozen foreign jurisdictions’ DLT regulatory designs on “...how to preserve the privacy of citizens and maintain the ability to combat illicit finance.” We have employed and investigated many tech providers, cryptocurrencies, and tested multiple DLT minimum viable products and designs. Much of what we found does not protect, rather the intended effect of these developers has

been to disrupt and to destroy long-standing legal relationships.// Broad support from key stakeholders: After working out the details of a payment and tracking system within the ODS and SEC FinHub sandboxes, INTR introduced HB 3279, the Oklahoma Distributed Ledger Technology Assets Offering (DLTAO) Act with bipartisan passage in the OK House (75-12). We withdrew the bill from OK Senate consideration for reintroduction next session. We determined that the stakeholders need to determine and better integrate the banking and Federal Reserve perspectives. (Throughout these comments, we will quote from the language of OK HB 3279, as the proposed law bears on the issues raised for comment.)

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

An iterative and alternative approach exploring a CBDC's potential benefits in a pilot project: banking the unbanked in Indian Country could positively achieve the Federal Reserve's CBDC goals. //INTR's charter goals overlap those of the Federal Reserve as we seek: "...how a CBDC could improve the safe and efficient domestic payments system." INTR's charter assignment is to "define and safeguard" an Indian Country fintech integration so as to bank the unbanked by using U.S. bank depositories for asset backing of the CVC. INTR proposes to use its CVC and DLTAO ecosystem designs to help demo and explore a United States CBDC design for potential properties, costs and benefits beginning with the Indigenous unbanked in Central Oklahoma. //A Federal Reserve CBDC would be a liability of the Federal Reserve, but commercial banks might not receive enough support were a CBDC only administered by the Federal Reserve. Thus, a CBDC by definition would tend to replace, rather than complement current forms of money and methods for providing financial services. INTR's intermediary approach with the unbanked will allow commercial banks to be used as depositories for purchasing and backing a CBDC. //"/Move fast and break things!" was the mantra of early tech innovators, but the federal securities regulators, financial agencies, and the U.S. Congress have pushed back against lawless tech firms. Benefitting the public interest and the Federal Reserve's remit is INTR's charter and statutory mandates. There are potentially great social and economic benefits in moving deliberately in accordance with the Rule of Law in order to protect the U.S. dollar and a stable monetary policy using DLT. Our evolutionary and iterative designs involve studying DLT failures. Regulatory agencies helped INTR's securities, organizational, and tech designs; now we seek the Federal Reserve's regulatory guidance.// In the DLTAO Act, HB 3279 drafts, we embedded federal securities laws into Oklahoma law through reference to INTR's no action features and by inclusion of the officially announced SEC no action positions. The reasons for proposing HB 3279 are: to provide a DLTAO regulatory framework, to thwart financial and criminal corruption, to collect taxes, to incubate DLT, and for financial inclusion of the unbanked.//A larger purpose is served by adapting a law first approach to distributed ledger technology (DLT) regulations. Typically, DLT transactions are immediately validated and cleared, then settled shortly thereafter, automatically without a central authority. A more optimal DLTAO ecosystem design should modify this unregulated and un-permissioned protocol with recourse, reversibility, and dispute resolution. Our design optimization calls for closed, but permissioned, and interoperable "Hoop\$", and uses a licensed fiduciary (INTR) and a stable token, Trak\$, which is a programmable U.S. dollar avatar backed by deposits in U.S. and/or state financial institutions.//The regulatory design strategy is intended to establish an optimal economic development utility incubator for solving universal and intractable problems such as dispute resolution, financial inclusion, tax evasion, and money laundering. To evolve such a universal capability one would do well to seek chaotic use cases that are complex, and then overlay a minimum viable legal, organizational and DLT product design solution. If the design involves a digital asset, the next step is the SEC Fin Hub sandbox. The multi-jurisdictional, tribal casino, cannabis/hemp regulation and tax remittance, cryptocurrency, and money laundering problems appeared to us as the worst regulatory problems with the most difficult DLT design challenges. We have sorted out the factual, legal, organizational, and tech details for several of those use cases and formally demonstrated the same by written submissions and live presentations in multiple instances to SEC Corp Fin/Fin Hub staff and to the SEC Fin Hub director, Valerie Szczepanik, on February 23rd, 2022.//Such an ecosystem as described in the OK DLTAO Act and presented to the SEC would "...not favor any policy outcome..." but could enable federal, tribal and state governments collaboration and cooperation in creating a CBDC minimum viable product for testing. An Indian Country pilot might provide a study for more efficient underwriting, tax, securities, and financial compliance using DLT for custody, payment, services and product/services tracking. Working together, multiple jurisdictions could integrate a federal, state, local, and tribal compliant digital payment landscape for the future, while fitting within the current SEC securities', UST, OCC, FinCEN, FDIC, and Federal Reserve monetary policies' envelopes.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Banking the Indigenous Unbanked: "MENDING THE HOOP" A pre-Columbian economic system, which some Natives referred to as the "Hoop" was long established before being broken. There are over 33,000 enrolled tribal members living in Central Oklahoma. Many are unbanked and nearly all live outside of their tribal jurisdictions. Indigenous Nations Digital Villages or "Indigivils" can be launched using a combination of tablets, apps, and special ATM's to bank the unbanked in remote places. Indigivils first launch is as a pilot project in Oklahoma and Cleveland Counties, which are not tribal lands included in the McGirt v. Oklahoma decision, but are rural, suburban and urban, former "Unassigned Lands."//INTR has authority to operate a Credit Program here in accordance with its tribal charter and the Oklahoma Indian Welfare Act. Both the statute and charter require INTR to use U.S. and state banks as depositories. INTR and its community partners proposed the Oklahoma Distributed Ledger Technology Assets Offering (DLTAO) Act, which was on its way to passage in April 2022. If the law passed, it could clarify for Oklahoma and its tribal governments a federal securities and BSA compliant system for governments using DLTAO vendors to bank the unbanked.//In articulating the collaboration of tribal and state in the proposed DLTAO Act, we have welcomed the leadership and words of support coming from the Federal Reserve's Vice Chair, Lael Brainard. She appeared and presented before our Oklahoma tribal communities in October 2021 at Oklahoma City: "As Native communities tackle these impediments to financial inclusion, collaborative efforts across a range of public-sector, private-sector, and nonprofit organizations can be helpful. As part of our mission to build a strong, inclusive economy, the Federal Reserve has a role to play in supporting economic growth and financial inclusion in Native communities."

<https://www.federalreserve.gov/news/events/speech/brainard20211013a.htm>

#### COLLABORATION TO HELP THE UNBANKED BY EXPLORING CBDC

DESIGNS--Electronic Fund and Information Transfer System Interchange: Integrate a federal, state, local, and tribal compliant digital payment landscape for the future, while fitting within the current US Treasury, SEC, and Federal Reserve monetary and securities policies. Define, integrate, and safeguard Indian Country distributed ledger technologies (DLT) within U.S. financial institutions to design, demonstrate, and explore a United States central bank digital currency (CBDC) creation for potential properties, costs, and benefits.

<https://www.federalreserve.gov/news/events/speech/brainard20220218a.htm>//Distributed Ledger Technologies(DLT) to Bridge the Indigenous Financial and Digital Divides Over 16 percent of Indigenous households were unbanked in 2019—three times higher than the national average. Unbanked Poor Problems: credit readiness, homebuyer education, lack of local bank branches, trust property as collateral, Native small businesses, financial literacy, and personal financial management skills. FinTech Solutions: Digital Assets Processors, Distributed Ledger Technologies, Smartphones/Tablets, Trak\$ ATM's, and Internet Access Indigenous Nations Digital Villages or Indigivils: Public/private sector cooperative associations can grow distributed ledger technology (DLT) networks for financial and digital inclusion by using available resources: technologies, organizations, institutions, and existing laws. Indian Country fintech utility incubator for financial and digital "...collaborative efforts across a range of public sector, private-sector, and nonprofit organizations..." Colonization Begins (1492): Breaking the Hoop • Indian Removal Act (1830): Remove Indians to Indian Territory (eventually becoming Oklahoma). • Worcester v. Georgia (1832): Marshall Court upheld Indigenous self-governance rights, but Jackson refused to enforce and began the Trail of Tears, forced removal of tribes to Indian Territory (Oklahoma). • Curtis Act (1898): Congress limits tribal self-governance in Oklahoma and takes away their lands again. Reversing Colonization & Mending the Hoop • OIWA (1936): Resurrected Oklahoma Indigenous powers of self-governance. • INDIAN SELF-DETERMINATION ACT (1975): Rejuvenated tribal governments by rejecting and countering previous bad policies. • IGRA (1988): Regulates Indian gaming to rejuvenate Indian Country. • POTUS (1999-2022): Presidential Memos on Tribal Consultation by Clinton, Bush, Obama, and Biden. • NABDA (2000): Encourages public/private partnerships and innovation. • McGirt v. US (2021): SCOTUS rules that portions of Oklahoma remain Indian land.

#### 4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?

Regulatory strategies demand that law code comes first and predetermines computer code. DLT can be designed with or without a central authority and by individuals or entities with no basis to trust each other. These networked back, decentralized, trustless systems like Bitcoin are intrinsically anarchic, unstable, and are not the needed design solutions for a U.S. CBDC, which could help with price stability or implementing U.S. monetary policies. Unregulated cryptocurrencies present legal and economic challenges of fluctuation, anonymity, and money laundering. At a minimum, the ideal ecosystem enforces regulated and stable transactions acceptable to the SEC, FinCEN, OCC, FDIC, and the Federal Reserve, thus requiring reversibility and trusted intermediaries or fiduciaries for AML, KYC, BSA. INTR acts through licensed and bonded fiduciaries and can serve in a central intermediary role determining who can set up a node and confirm transactions in a given

permissioned ecosystem. The more INTR was guided by regulators in its DLTAO design criteria, the more we explored an emerging concept which we discovered had gradually broadened into an “internet of regulation”. These regulatory strategies demand that law code comes first and legal code must dominate computer code. When the Oklahoma DLTAO Act was introduced in the OK House, there was immediate pushback against anyone suggesting monopolistic tech or government centralized control. OK HB 3279 has been influenced by public opinion and numerous corrections were made to satisfy critics. In addition to the HB 3279, multiple local, state, federal and tribal governments and agencies, including the SEC and branches of the state of Oklahoma government, have been contributing to our iterative DLTAO design evolution. The optimal CBDC scenario appears to indicate an ecosystem of trust. The ideal CBDC could require either directed or independent intermediaries serving as licensed fiduciaries or trustees in the public interest overseeing distributed ledger offerings. DLT ecosystems should have as their prime motivation, the reinforcement of trustworthiness and incorruptibility within the financial system. Using DLT to support and to effectively implement monetary policy in the pursuit of the Federal Reserve's maximum-employment and price-stability goals, the following criteria are central considerations. To Create Value or Issue Bank or Asset Backed Assets not Simply Vanishing Virtual or Network Backed Assets To Transfer and Record Value or the Ownership of Real Assets Based Upon Immutable Identity and Authenticated Agreements To Reverse Those Transfers of Value or Ownership of Tangible and Intangible Assets and to Resolve Disputes Between Parties to Transactions To Allow Owners of Assets to Exercise Certain Rights and Duties Associated With Ownership, and to Record the Exercise of Those Rights and Duties in Accordance With Choice of Law, Venue, and Jurisdiction PROOF OF WORK CONSENSUS DOES NOT SERVE THE NEEDS OF A CBDC INTR exercised its capability to act as a fintech utility incubator and intermediary with the recent passage of HB 3279 in the OK House (DLTAO Act). The CVC sandbox designs demoed to the SEC for casino and cannabis tax remittance and AML were a starting point for drafting the DLTAO Act. The ecosystem was designed with a programmable digital dollar and flexible logistical and payment tracking features tied to custodian/product/event/services. The purpose of selecting the use cases of federally legal industrial hemp and state-lawful, medical cannabis taxation and regulation in Oklahoma, was to find the most confused regulatory challenge for which to design a DLT solution. Then INTR took the best parts of that rigorous design to organize a regulatory solution in the form of a state statute integrating federal, state, and tribal laws. We experimented and found it impossible for certain tech designs to conform to the law. A U.S. CBDC using a decentralized cryptocurrency ecosystem and a trustless “Proof of Work” consensus mechanism like Bitcoin uses would negatively “... affect the Federal Reserve's ability to effectively implement monetary policy.” Poor Proof of Work Performance (Millisecond) Transactions Scalability is an often-cited concern of current blockchain technology. Bitcoin handles 7 TPS on average with greatly delayed confirmation times. Ethereum is much faster with 25 TPS, which pales in comparison to the 1,700 TPS achieved by VISA. Trustless Proof of Work Wastes Energy The current estimated annual electricity consumption of Bitcoin is estimated at 40.5 TWh, an amount above the annual consumption of entire countries, such as Argentina or Belgium.

##### *5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

The choice of CBDC designs will determine its negative or positive effects on financial stability. Insofar as it is possible, the goal should be to preserve the financial stability status quo with the use of any CVC or CBDC using DLT. The problem is that many of the cryptocurrency projects are disruptive and were particularly designed to compete or interfere with the U.S. central bank. The Federal Reserve promotes stability and reduces systemic risks and has done a remarkably good job if one looks at the challenges presented in 2008. Those features which helped to overcome that near meltdown should be bolstered and not disrupted. The advent of the first cryptocurrency project was Bitcoin in 2008 and it was specifically directed as an alternative to fiat currency and central banking. A CBDC with optimal design capabilities would dampen the effects of these disrupters and facilitate positive stability to counteract negative imbalances through: Monitoring- The ideal registry, custodian, and events correlations allow the granular monitoring of specific dollars, banks, people, locations, transfers, and industries and could be done in real time. Supervision at Micro and Macro Levels- Within an optimal DLTAO ecosystem, if a given commodity or service price level becomes unstable in a region, for example the price of asparagus grown in Central Valley, that event could be identified immediately, correlated and reported to the party with the need to know. This would reinforce the Fed's capability and “...promotes the safety and soundness of individual financial institutions and monitors their impact on the financial system as a whole, while helping to serve the Federal Reserve Charter purposes of “... consumer-focused supervision and examination, research and analysis of emerging consumer issues and trends.” Cryptocurrencies and Stable Coins Provide No Consumer Protection and Have High Run Risk: Most cryptocurrencies and stable tokens are not asset

backed nor do they have guaranteed or audited deposits. The regulated stable coin must be asset backed within insured U.S. depository institutions, which are subject to appropriate supervision and regulation, at the depository institution and the holding company level. Payment System Risk: Wallet providers would be subject to appropriate federal oversight. In addition, any DLTAO ecosystem operator as supervisor of CVC issuance must meet appropriate risk-management standards. The state of Oklahoma legalization of medical cannabis presented regulatory chaos and provided the opportunity for us to design a complete DLT solution for an intractable regulatory problem. The DLTAO Act was drafted to reduce the chaos of an unregulated cannabis supply chain. Engagement in US and Abroad- The design elements could be broadened to include most other logistical and payment challenges. Relevant provision from OK HB 3279 (DLTAO ACT): AS INTRODUCED An Ac relating to technology; creating the Oklahoma Distributed Ledger Technology Assets Offering Act; providing legislative findings; defining terms; authorizing state to develop and use distributed ledger technologies; requiring certain software; requiring certain security and legal requirements; permitting use of certain smartphone applications; authorizing additional uses; requiring certain software features; limiting use of convertible virtual currency; prescribing value of convertible virtual currency; providing requirements for digital and smart contracts; requiring a digital identity and wallet; prohibiting use of convertible virtual currency as an investment; requiring use of decision tree; requiring separate digital contract to charge a fee; prescribing procedure for payment; requiring ecosystem operator to collect fees and taxes; requiring ecosystem operator to perform certain accounting; prescribing method of compensation; requiring ecosystem operator to provide certain information; requiring the Oklahoma Tax Commission and Office of Management and Enterprise Services to make certain determinations; authorizing the Tax Commission, Office of Management and Enterprise Services, Secretary of State, and State Treasurer to promulgate rules; allowing payment of taxes from certain sources; permitting Tax Commission to appoint agents for certain purposes; creating requirements for distributed ledger technology asset offering agents; creating requirements for distributed ledger technology asset offering ecosystem operators; authorizing the Tax Commission and Office of Management and Enterprise Services to promulgate rules to validate transactions; allowing certain contracts; allowing use of memorandums of understanding; allowing certain working groups; prohibiting certification as a class action;

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

The ideal CBDC is not disruptive, but it harmonizes with existing regulatory and financial systems. Why is digital currency not widely used? lack of regulation unstable value slow transactions stigma from use in money laundering, tax evasionAn optimal CBDC can be used readily as digital contracts built to protect users and the law. regulated and protected by international, federal, state, and tribal laws always worth \$1 and 100% reserve backed in US banks or as a CBDC closed loop payment mechanisms that are fast, efficient, and safe prevents cybercrime, money laundering, and tax evasion Regulated Convertible Virtual Currency Reportedly, cyber criminals will steal over \$6 Trillion in 2021, exceeding the GDP of Japan. \$USD backed, smart money can be used with a mobile app or card so as to prevent cybercrime and to collect taxes. Profits should fund sustainable community development in rural, low-income, and minority communities. Problem: US agencies struggle with digital currencies as governments, consumers, and businesses seek a safe, usable option. Solutions: select regulators opinions on CVC's- An optimal design is that of a regulated, reserve backed, stable digital currency intelligently built to protect privacy, law, people and their rights. "...our current payment mechanisms, domestically and internationally, have inefficiencies, those inefficiencies are the things that are driving the rise of bitcoin" - Former SEC Chairman Clayton (November 23, 2020). Despite its recent rise, Bitcoin price volatility, slow transactions, lack of regulation, high power needs, and illicit activity problems, all limit mainstream use. Satoshi Nakamoto ushered in the "Internet of Value". Mark Zuckerberg advocated for the adoption of Libra and Diem for his personal "Internet of Money". A CBDC with an intelligent design could incubate an "Internet of Regulation" capable of reinforcing legal norms. "...(P)rivate digital currency-based payment systems could magnify concerns surrounding illicit activity and consumer risk" - Federal Reserve Governor Brainard (February 5, 2020). CBDC transactions must be federally reported. The ecosystem operator as a fiduciary and intermediary, ideally collects and remits taxes as it flags and reports illicit activities. Encryption and distributed ledger technology eliminate common consumer vulnerabilities "...if we really think the crypto world is going to be part of the future, it needs to come inside of the public policy envelope." -Gary Gensler, SEC Chairman (October 15, 2018) According to US Treasury Secretary Janet Yellen "...regulating institutions that deal in bitcoin...is certainly important." (February 18, 2021)REGULATORY COMPLIANT DLT From 2016 to 2021, the United States Securities and Exchange Commission has provided guidelines for intelligently designing a CVC. SEC Commissioner Hester Peirce observed that "...the opportunity to develop multiple regulatory solutions to a single problem, is a feature of the United States' own system" (July 30, 2019)USE CASE | LAW | ORGANIZATION | TECH● Since 2016, INTR has modeled, developed, and integrated legal, DLT, and organizational sandbox designs to explore a programmable digital

dollar design for the unbanked, casino, cannabis, and crypto use cases in order to comply with federal, tribal, and state policies. • INTR is designed to enable federal, tribal, and state governments to efficiently ensure legal, tax, securities, and financial compliance by using DLT for custody, payment, and product/services/event tracking solutions. • We adjust our ethical, organizational, and tech protocols with key agencies' guidance and regulations, to include S.E.C. Fin Hub, the U.S.T. and the Federal Reserve. Proof of Trust and an Optimal CBDC. The Proof of Trust protocol permits transactions to be gathered sequentially and recorded; cryptographically validated in chronological order; and allows the resulting ledger to be accessed by different servers. Unlike the thousands of unregulated, network-backed crypto- INTR has not issued any tokens or posted a public web site and has only moved value in the SEC sandbox in demos before Corp Fin and Fin Hub staff lawyers and directors. INTR's "Trak\$" CVC design will be asset backed and guaranteed in U.S. banks.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

The Rule of Law is the socio-economic tool lacking from multiple unregulated cryptocurrencies. Traditional societal, legal, and economic values seem almost everywhere absent from the Internet. These simple tools that we use every day to enforce the law, protect consumer vulnerabilities and to attain the benefit of any contractual bargain are identity, informed consent, and dispute resolution. Any CBDC connected to the Internet should be a regulatory design with effective and reliable protections for consumers. If there is to be a CBDC with correlative rights and duties, a new covenant for an American version of World Wide Web citizenship should be explored. If we begin migrating deliberately onto the Internet our brick-and-mortar laws, customs, and norms, the substantive and procedural laws should be easily enforceable within and throughout the Internet by regulators and the courts. Many of these promoters and developers with their thousands of unregulated cryptocurrencies have announced a goal of anarchy calculated to disrupt and dominate domestic and international economic relationships. The stated purpose has been to replace economic reality and trust with a trustless virtual society whose starting point is computer code. While in the SEC sandbox, INTR was guided to create the basic tools for mitigating adverse impacts of a CBDC on the financial sector. Those tools do not begin with computer code, but are customary, legal and inherent in our everyday lives within civil society and are found in our legal codes and precedents. Digital Contract to Verify Consent-Smar>Trak\$ Example: – Defines consent to agreement or contractual conditions under which corporate bond transfer occurs and uses a decision tree for specifying agreed to terms. Business Rules or Governing Laws Agreed to within any Contract are Entered upon a Decision Tree and are Embedded in the Distributed Ledger & Executed with the Transaction Mutual Consent is Given by the Parties to the Agreement upon an Easy to Read Decision Tree Format which is Verifiable and Signed Encoded in Programming Language Reflects the Consent of the Parties to the Enforceable Agreement, to Include Provisions for Breach, ROI, Liquidation, and Bond Discharge Terms. Digital Contract to Verify Identity-Self>Trak\$ Ledger is shared, but participants require privacy and governments require identity reporting for Travel Rule compliance. Solution is to use bonded and licensed fiduciaries as trusted intermediaries for Regulatory and Contractual Compliance and Certainty. Regulatory needs – Transactions to be regulated – Identities of the parties must be linked to a transaction and known by a fiduciary as intermediary so as to Comply with Banking and Securities Laws. Transactions must be authenticated and identities verified with 2FA, biometrics, etc. Identities are Protected by Distributed Ledger Technologies. The use of cryptography is overseen by licensed and bonded fiduciaries engaged as trusted intermediaries supervising all suspect transactions for compliance, and are essential to these regulated processes, thereby fulfilling commercial and regulatory expectations so as to reduce transaction risks and to increase voluntary adherence to the Rule of Law. Provisions relative to a regulatory tool kit quoted from OK HB 3279 (DLTAO ACT): I. Every distributed ledger technology asset offering ecosystem shall be designed in such a way that it becomes a public utility for tax remittance, payment, custodian and product or service information transfer and revenue sharing, and to become autonomous and disintermediated by using programmable smart contracts managed by algorithms and encoded with relevant state, county, local, tribal, or federal laws and regulations for taxation, accounting, escrows, remittances, custody tracking, and other applications. J. The initial use case shall be a distributed ledger technology asset offering ecosystem which shall provide an integrated logistics, payment, and tax recording and remittance system for the use of government taxing and regulatory authorities that will also provide for customer payment and custody transfers using escrow and smart contracts for services and goods at the retail and wholesale levels among producers, merchants, and customers. K. Every distributed ledger technology or fintech vendor shall tailor its technology to comply with and conform to the state's records laws and regulations for dispute resolution, evidentiary proceedings, money services businesses, tax revenue remittance, tax reporting, securities, and escrow.

*8. If cash usage declines, is it important to preserve the general public's access to a form of*

*central bank money that can be used widely for payments?*

AN OPTIMAL USE CASE FOR A CBDC DESIGN AND LAUNCH TESTING: Banking the Indigenous Unbanked: A minimum viable product for a payment and data network using specially configured ATM's and distributed ledger technologies for the Indigenous unbanked, should have the least regulatory friction and the greatest government and financial community support. The social media responses, focus groups, mainstream media and legislative feedback from introducing HB 3279 (OK DLTAO Act) indicate that everyone wants cash left in the system. A cash dispensing and acceptance capability launch will require physical locations with ATM branches which take and dispense cash. The long-term objective is a CBDC design. We might have created a minimum viable product (MVP) design for a CBDC in the initial DLTAO Act phase. However, this phase involving building out ATM's and their physical branch locations should further reveal the optimal design and deployment which will allow cash transactions. According to the paper, a CBDC should be "... privacy-protected, intermediated, widely transferable, and identity-verified." The intermediated model suggested in the paper would best facilitate INTR's existing privacy and identity-management design frameworks, allow innovation; and reduce disruptions to U.S. monetary policy. "(T)he private sector would offer accounts or digital wallets to facilitate the management of CBDC holdings and payments." If the unbanked are to be included financially, cash transactions can be cleared and settled automatically but reports must be filed with OCC or FinCEN of cash transactions exceeding \$10,000 (daily aggregate amount), and suspicious activities reported that might signal criminal activity (e.g., money laundering, tax evasion) INTR would ideally be in a position, vis-a-vis, state operations to support state and federally chartered commercial banks by making deposits in those institutions for backing the CVC with bank assets. The proposed OK DLTAO Act provides for deposits for asset backing in local banks. Moreover, tribal government or international financial operations would best be backed by the Federal Reserve issued CBDC. The proposed bill received the greatest group opposition from the State Banking Department at the last hour before the matter was to go to the Oklahoma Senate Commerce Committee vote. This opposition emerged after multiple attempts were made over several years to inform the state agency concerning the nature of OK HB 3279 and those engaged in its advocacy. Relevant provision from OK HB 3279 (DLTAO ACT): "(M)aking cashless purchasing easier with biometric identification and database matching and providing for the availability of easy digital asset payment systems, which can convert cash, bank debit account or checking deposits, and credit cards to a digital asset representing as a programmable digital dollar,"

9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

WITHOUT THE FEDERAL RESERVE OVERSEEING CBDC DEVELOPMENT, THERE WILL BE CONTINUOUS NONCOMPLIANT EXPERIMENTS, WHICH VIOLATE SECURITIES LAWS AND THE TRAVEL RULE Devolving Down to Economic Anarchy • Bitcoin -- "Nakamoto" (2008) <https://bitcoin.org/bitcoin.pdf> • Ethereum -- Buterin (2013) <https://ethereum.org/en/whitepaper/> • Ripple/XRP -- Schwartz (2014) <https://www.allcryptowhitepapers.com/ripple-whitepaper/> SEC Regulatory Framework • Former Chairman Jay Clayton (Dec 2017): <https://www.sec.gov/news/public-statement/statement-clayton-2017-12-11> • Former Director William Hinman (June 2018): <https://www.sec.gov/news/speech/speech-hinman-061418> • FinHub created (Oct 2018): <https://www.sec.gov/press-release/2018-24> TurnKey Jet: Jonathan Ingram, <https://www.sec.divisions.corpfin/cf-noaction/2019/turnkey-jet-040219-2a1.htm> Valerie Szczepanik of FinHub (March 2019): Explained at South by Southwest (SXSW) in Austin, Texas that the SEC's existing securities laws may regulate certain types of stable coins: "So, you can call it a utility coin, call it a stable coin, call it a consumptive coin or some other coin. We're going to look at the characteristics. What's the economic reality? What's happening with the transactions involving the coin? And we'll give it the label that it deserves under the law." <https://decrypt.co/5940/securities-czar-stablecoins-might-be-violating-securities-laws-10> • Libra (June 2019) -- Zuckerberg -- "The world truly needs a reliable digital currency and infrastructure that together can deliver on the promise of 'the Internet of Money.'" • Pocketful of Quarters (July 25, 2019) -- Jonathan Ingram, <https://www.sec.gov/corpfin/pocketful-quarters-inc-072519-2a1> • Renegade Panda (July 30, 2019) -- Commissioner Hester Peirce, <https://www.sec.gov/news/speech/speech-peirce-073019> Optimal Distributed Ledger Technology Ecosystem Designs. Any of INTR's progress has been evolving in an iterative, trial and error process. The project always proceeds with law first and combines law practice and distributed ledger technologies. We use behavioral code, law code, and computer code combined and methodologically resolved. Use case, law, and tech combined is one way of expressing this neural, jural, computational parallel to fact-law-tech. Proceeding with law first has proven to be a superior method for legally compliant and socially beneficent technologies designs. INTR began to develop and design this law first technique, fitting it within regulatory

parameters for DLT and AI, with the guidance and oversight of local, federal, state, and tribal government agencies. Beginning in 2018, INTR entered the securities sandbox with the U.S. Securities and Exchange Commission, Corp Fin/Fin Hub, and the Oklahoma Department of Securities. This four-year process has culminated in INTR, giving optimally compliant, distributed ledger technology demonstration presentations to the SEC Corp Fin/Fin Hub staff attorneys. SEC Director Valerie Szczepanik attended INTR's most recent DLT demo, which was held on February 23rd, 2022. Inspiration and invitation for SEC Engagement- In July 2019, SEC Commissioner Hester Peirce gave her "Renegade Panda" speech in Singapore, calling for cross-border regulation of digital assets and announcing the formation of Fin Hub. As Commissioner Peirce observed: "In the U.S., we often refer to our states as 'laboratories of democracy.' Instead of implementing all policy at the federal level, different states try different policies. Policies that prove to be highly effective can serve as models for federal level policy and can inform the development of policy by the other states." SEC Commissioner's Call to Action: INTR immediately sent a letter to SEC Fin Hub for consideration in helping to realize a "Renegade Panda" solution. INTR has four years of sandbox designs with government agencies and close, iterative coordination with Fin Hub, under the watchful guidance of Corp Fin lawyers and staff. Now INTR suggests it should continue striving for an optimal cross-jurisdictional regulatory and institutional response, such as Commissioner Peirce envisioned and with the Federal Reserve's input. INTR has attempted to foster innovation and competition by borrowing the best DLT practices and by incubating new regulatory evolutions within the State of Oklahoma and Oklahoma Indian Country, two of the "laboratories of democracy."

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

WITHOUT THE FEDERAL RESERVE OVERSEEING CBDC DEVELOPMENT, THERE WILL BE CONTINUOUS NONCOMPLIANT EXPERIMENTS, WHICH VIOLATE SECURITIES LAWS AND THE TRAVEL RULE Devolving Down to Economic Anarchy • Bitcoin -- "Nakamoto" (2008) <https://bitcoin.org/bitcoin.pdf> • Ethereum -- Buterin (2013) <https://ethereum.org/en/whitepaper/> • Ripple/XRP -- Schwartz (2014) <https://www.allcryptowhitepapers.com/ripple-whitepaper/> SEC Regulatory Framework • Former Chairman Jay Clayton (Dec 2017): <https://www.sec.gov/news/public-statement/statement-clayton-2017-12-11> • Former Director William Hinman (June 2018): <https://www.sec.gov/news/speech/speech-hinman-061418> • FinHub created (Oct 2018): <https://www.sec.gov/news/press-release/2018-24> TurnKey Jet: Jonathan Ingram, <https://www.sec.gov/divisions/corpfin/cf-noaction/2019/turnkey-jet-040219-2a1.htm> Valerie Szczepanik of FinHub (March 2019): Explained at South by Southwest (SXSW) in Austin, Texas that the SEC's existing securities laws may regulate certain types of stable coins: "So, you can call it a utility coin, call it a stable coin, call it a consumptive coin or some other coin. We're going to look at the characteristics. What's the economic reality? What's happening with the transactions involving the coin? And we'll give it the label that it deserves under the law." <https://decrypt.co/5940/secs-crypto-czar-stablecoins-might-be-violating-securities-laws-10> • Libra (June 2019) -- Zuckerberg -- "The world truly needs a reliable digital currency and infrastructure that together can deliver on the promise of 'the Internet of Money.'" • Pocketful of Quarters (July 25, 2019) -- Jonathan Ingram, <https://www.sec.gov/corpfin/pocketful-quarters-inc-072519-2a1> • Renegade Panda (July 30, 2019) -- Commissioner Hester Peirce, <https://www.sec.gov/news/speech/speech-peirce-073019> Optimal Distributed Ledger Technology Ecosystem Designs. Any of INTR's progress has been evolving in an iterative, trial and error process. The project always proceeds with law first and combines law practice and distributed ledger technologies. We use behavioral code, law code, and computer code combined and methodologically resolved. Use case, law, and tech combined is one way of expressing this neural, jural, computational parallel to fact-law-tech. Proceeding with law first has proven to be a superior method for legally compliant and socially beneficent technologies designs. INTR began to develop and design this law first technique, fitting it within regulatory parameters for DLT and AI, with the guidance and oversight of local, federal, state, and tribal government agencies. Beginning in 2018, INTR entered the securities sandbox with the U.S. Securities and Exchange Commission, Corp Fin/Fin Hub, and the Oklahoma Department of Securities. This four-year process has culminated in INTR, giving optimally compliant, distributed ledger technology demonstration presentations to the SEC Corp Fin/Fin Hub staff attorneys. SEC Director Valerie Szczepanik attended INTR's most recent DLT demo, which was held on February 23rd, 2022. Inspiration and invitation for SEC Engagement- In July 2019, SEC Commissioner Hester Peirce gave her "Renegade Panda" speech in Singapore, calling for cross-border regulation of digital assets and announcing the formation of Fin Hub. As Commissioner Peirce observed: "In the U.S., we often refer to our states as 'laboratories of democracy.' Instead of implementing all policy at the federal level, different states try different policies. Policies that prove to be highly effective can serve as models for federal level policy and can inform the development of policy by the other states." SEC

Commissioner's Call to Action: INTR immediately sent a letter to SEC Fin Hub for consideration in helping to realize a "Renegade Panda" solution. INTR has four years of sandbox designs with government agencies and close, iterative coordination with Fin Hub, under the watchful guidance of Corp Fin lawyers and staff. Now INTR suggests it should continue striving for an optimal cross-jurisdictional regulatory and institutional response, such as Commissioner Peirce envisioned and with the Federal Reserve's input. INTR has attempted to foster innovation and competition by borrowing the best DLT practices and by incubating new regulatory evolutions within the State of Oklahoma and Oklahoma Indian Country, two of the "laboratories of democracy."

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Relevant provision from OK HB 3279 (DLTAO ACT): A. For convertible virtual currency designed for the state and its political subdivisions, an entity operating an ecosystem, and any entity affiliated with the ecosystem operator, shall not use any proceeds from the convertible virtual currency sales, purchases, transfers, or conversions to develop the ecosystem, applications, or platforms referenced by this act, which shall be fully developed and operational at the time of any convertible virtual currency transfer or conversion. B. The convertible virtual currency designed for the state and its political subdivisions shall be exclusively marketed to customers and immediately usable for its intended function or functions at the time it is purchased, sold, transferred, or converted and not with any potential for the increase in the market value of the convertible virtual currency. C. The ecosystem operator shall restrict sales, purchases, transfers, and conversions of the convertible virtual currency to ecosystem digital wallets only. D. Any customer who holds convertible virtual currency designed for the state and its political subdivisions may only transfer or convert the convertible virtual currency at the face value of One United States Dollar (\$1.00) per convertible virtual currency to another ecosystem-approved wallet. E. The operator of the ecosystem shall sell, purchase, transfer, and convert the convertible virtual currency designed for the state or its political subdivisions at a price of One United States Dollar (\$1.00) per convertible virtual currency throughout the life of the program, and each convertible virtual currency shall represent an ecosystem obligation to convert or transfer the convertible virtual currency at a value of One United States Dollar (\$1.00) per convertible virtual currency. F. Convertible virtual currency designed for the state or its political subdivisions shall be fully backed by United States dollar assets deposited in United States financial institutions. G. Selling, buying, converting, or transferring convertible virtual currency designed for the state or its political subdivisions for less or more than One United States Dollar (\$1.00) shall be technologically impossible. A. Digital contracts or smart contracts used by this state and its political subdivisions shall be programmed for accountancy, identity, regulatory permissibility, and legality, credit verification, product location, work performance, customer status, agreements, and various relationships as conditions precedent to escrowed funds release. B. Smart contracts shall track performance from inception to completion and legally satisfy the release from escrow, which initiates a convertible virtual currency transfer. C. The ecosystem network provided for the benefit of state agencies, political subdivisions, and tribal-level entities on a voluntary basis shall be controlled and regulated by an electronic funds transfer system interchange. D. Anyone who interacts with the ecosystem shall have a digital identity and wallet which shall be a precondition to initiating a convertible virtual currency transfer. E. Any transfer of convertible virtual currency shall be in accordance with the Travel Rule as defined in Section 4 of this act. F. Customers shall agree with a conspicuous electronic signature declaring that they are acquiring the convertible virtual currency for a consumptive purpose and not as an investment, nor with an expectation that the convertible virtual currency shall earn profits based upon the activities and efforts of third parties. G. Convertible virtual currency functionality shall always be associated with a digital contract, which shall determine the terms of how, when, where, and to whom any convertible virtual currency is transferred or converted by an ecosystem operator. H. Before any transfer, purchase, sale, or conversion of convertible virtual currency is finalized, the customer shall first enter decision tree terms to show mutuality of consent between customers. I. To form a smart contract or to obtain any services from the ecosystem, customers in a supply chain must agree to terms and fees for using the smart contract software, which may be established by the participating state agency, political subdivision, or tribal entity and the ecosystem operator who provides various services in exchange for the customer paying the fees to the ecosystem operator, as set forth in a smart contract agreement for services rendered as determined between the parties or by operation of the participating government agency, tribal entity, or political subdivision. J. Customers may purchase digital contracts and the negotiation of the charged fee in another digital contract, which is the smart contract, escrow, and accounting tool that determines the income going to the ecosystem operator for its services and that defines the ecosystem operator-to-customer and any controlling law or regulation affect

*12. How could a CBDC provide privacy to consumers without providing complete anonymity*

*and facilitating illicit financial activity?*

Properly configured Distributed Ledger Technologies (DLT) have great promise as "truth machines" to provide privacy and could help deal with federal, state, and tribal government designs and regulation of a CBDC to prevent illicit financial activities. Currently, there are many controversies, illegalities, and abuses concerning cryptocurrencies and blockchains. There have emerged from blockchain businesses a plethora of Ponzi's, scams, and money launderers. Securities status and Banking Secrecy Act legalities are proper concerns for governments and their citizens. INTR's goal is to combine the best existing legal and managerial practices, and to operate in accordance with the European Union's (EU) General Data Plan Regulation (GDPR). ("The request for consent shall be presented in a manner which is clearly distinguishable from the other matters.") It should be clear to any participant what data processing activities are intended to be carried out, which grant the subject an opportunity to consent to each activity, separately and individually. Relevant provision from OK HB 3279 (DLTAO ACT) concerning how a CBDC could provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity? : 3) holding down compliance costs and allowing legal transactions at a lower price point, and (4) increasing logistical velocity and improving quality and quantity in supply chains by reducing delivery time, increasing specific product availability, and facilitating predictive, just-in-time production, processing, and merchandising, d. enhancing the stability of any legal market by: (1) using the cashless, electronic fund transfer of digital assets for all transactions between all parties within the specified community, including employees, to maximize micropayment capabilities and to create a maximally productive and legally adherent business community, (2) reporting shrinkage and lost product in the supply chain at any point and identifying culprits, (3) complying with the Anti-Money Laundering and Know Your Customer provisions of the federal Bank Secrecy Act, and the Suspicious Activity Reports of the United States Treasury Financial Crimes Enforcement Network, (4) increasing data collection for business owners and policymakers at a lower cost, thus reducing administrative compliance overhead, and (5) automating periodic data reporting volume and tracking data from point-of-sale systems, thereby providing policymakers and regulators with real-time data that predicts black market emergence, e. generating statistical data for decision-making by: (1) allowing designated agency or authorized political subdivision personnel to create surveys and order data sets, (2) allowing digital asset micropayments to obtain survey reporting participation, thereby reinforcing research efficacy, (3) establishing and collecting Health Insurance Portability and Accountability Act of 1996 (HIPAA) compliant, self-reported, voluntary patient reviews, and correlating and tracking specific products for their physiological and psychological efficacy, thus enabling patients, health care providers, labs, processors, and producers to better calibrate and correlate their related choices, and (4) giving policymakers empirically based and broad statistical samples based on surveys, f. optimizing the remittance, accounting, and reporting of tax revenue by: (1) tabulating financials for businesses and regulators and making data available to business owners and government agencies in real time and on a need-to-know basis, while using data privacy best practices, (2) allowing regulators to calculate business or activity density, estimate illegal activity, and model taxation rates to compete with and minimize black market activities, (3) monitoring consumer price sensitivity to allow for appropriate modification of taxation policy, and (4) keeping retail prices below the threshold consistent with best practices for preventing illegal activities,

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Relevant provisions from OK HB 3279 (DLTAO ACT): BE IT ENACTED BY THE PEOPLE OF THE STATE OF OKLAHOMA: SECTION . NEW LAW A new section of law to be codified in the Oklahoma Statutes as Section 12001 of Title 74, unless there is created a duplication in numbering, reads as follows: This act shall be known and may be cited as the "Oklahoma Distributed Ledger Technology Assets Offering Act". SECTION . NEW LAW A new section of law not to be codified in the Oklahoma Statutes reads as follows: The Legislature makes the following findings concerning the necessity for the Oklahoma Distributed Ledger Technology Assets Offering Act: 1. For the immutable recording of identity, contracts, and payments, as well as protocols that govern the production, distribution, and consumption of goods and services in a digital economy, distributed ledger technology assets offering ecosystems afford the most efficient, effective, and transparent method of achieving such, necessitating a proactive strategy to create, maintain, and advance the regulation of Internet activities; 2. Especially configured and government-regulated blockchain and distributed ledger technologies have emerged as critical solutions to many Internet crimes, cyberwarfare, tax revenue collection, product diversion, state and non-state acts of terrorism, money laundering, foreign interference with information technologies, and corruption problems; and in view of such, the State of Oklahoma has the potential to foster an Internet of regulation and to create new forms of decentralized platforms and distributed applications that have advantages over the current centralized Internet platforms and applications; 3. The State of

Oklahoma has the power and opportunity to realize its potential to become a global leader and a center for companies and entrepreneurs that seek to utilize distributed ledger technology systems to power blockchain- and distributed-ledger-technology-based business models, social media, and governmental systems, all of which will drive innovation within the state and give the State of Oklahoma an economic opportunity and global advantage to develop local economies, create new jobs, and export locally developed technologies; 4. Oklahoma's many sovereign entities and governmental units are not optimally integrated or united in law enforcement, Internet regulation, or first-responder efforts. Distributed ledger technology assets offerings, digital contracts, and immutable identities can enable precise financial auditing and the coordinated tracking and tracing of the activities of criminal elements, cyber incursions, and organized crime, making it more difficult for these criminal and terrorist elements to be able to hide their activities. These same capabilities will augment, facilitate, and integrate the protection of public safety and can immediately help first responders to identify and meet the needs of the citizenry, especially in victim identification, triage, treatment, search-and-rescue functions during natural and man-made disaster events, such as pandemics, tornadoes, and floods, and also will assist in detecting and preventing foreign military cyber and signals intelligence operations;

*14. Should a CBDC be legal tender?*

CBDC should be designed as legal tender. Exceptions could be made to limit the types of purchases and the nature of debtor payment could be controlled so that a CBDC would be difficult to use for crime. Moreover, having the capability of converting the cash transaction to a commodity using a CVC has ramifications for long term capital gains versus short term. The interface between the convertibility of the asset from currency to commodity seems to have broader ramifications for fiduciaries and financial products. INTR presented the following donative and commodity use case to the SEC Fin Hub on 2/23/2022. Dona>Trak\$: Digital contract that tokenizes a tribal casino customer's donative tax deduction on interest earned on assets escrowed in an attorney trust account. Interest is derived from storing a prepaid value using the convertible virtual currency (CVC) Trak\$ as a commodity and as an IRS 501c3 donor credit recorded as a digital contract (Dona>Trak\$). Escrowed by a tribal casino on behalf of a customer. Escrow services offered by the Oklahoma Bar Foundation (OBF) for member attorneys as a tax advantaged transaction deposited into a trust account pursuant to the OBF program known as- Interest on Lawyers Trust Accounts (IOLTA). The donor acquires the CVC or Trak\$ as part of a distributed ledger technology assets offering, with the CVC used as the digital dollar avatar backed by U.S. dollars in U.S. banks. Such an arrangement might drive funds into public purposes and establish reserves and equities which lend to financial stability. Although the DLTAO Act was written agnostic of any cannabis use case, when it was revealed that the ecosystem had particular relevance to regulate cannabis, a groundswell of interest ensued. The bill became highly controversial and motives surfaced relating to those engaged in tax evasion (one estimate was that as much as \$100,000,000 in cannabis taxes were not being paid). OK HB3279 benefits: promotes consumer protection and community development through consumer-focused supervision and examination, research and analysis of emerging consumer issues and trends, community economic development activities, and administration of consumer laws and regulations

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

NO. Beginning in April 2019, INTR submitted interest bearing digital dollar designs to state and federal securities regulators as part of no action applications. We proposed a token which would attract more holders and it would be backed by assets like Treasuries and blue-chip stocks so that it could gain in value to offset inflation. Both securities agencies, the S.E.C. Fin Hub and Oklahoma Department of Securities, rejected a digital dollar design which accrued in value or had an ROI. Why not? The basic CBDC should not compete with bank interest rates. The CBDC can be an avatar for the U.S. dollar and operate like cash and not pay interest, otherwise it could compete with not only banks but US Gov't securities. The U.S. digital dollar's value should be neutral and truly reflective of the U.S. cash dollar design, A key function of the Federal Reserve is to "...facilitate U.S. dollar transactions and payments..." The U.S. dollar does not pay interest and a CBDC that pays interest works more like a bond or stock than it does a currency. How? The measure of the dollar's purchasing value as it relates to the CPI and inflation calculator is a natural function of fiat currency inflation and the Federal Reserve has a predictable mechanism for the control of inflation by adjusting interest rates. Other CBDC related products which accrue interest could be devised which involve tokenization to increase access. For example, treasury bonds could be tokenized and purchase of treasuries is an existing strategy of many to hedge against inflation. To give greater access to the retail sale of treasury bonds by tokenization and DLT asset offerings could be a product that the U.S.T. and the Federal Reserve might consider. The root idea behind INTR's internet of regulation approach is to not disturb

existing systems, like the cash dollar or digital dollar systems. INTR would support the Federal Reserve function of fostering a payment and settlement system safely and efficiently through services to facilitate transactions and payments. Coders and data architects should be led by lawyers and behavioral economists so as to mimic existing economic systems in order to achieve stability, control, and to avoid disruption. The best practice in designing virtual economic systems is to have the major premise be the fact/law/policy and the minor premise is the tech. This can be described as a neural-jural-computational process and consists of migrating the relevant law(s) onto the Internet and embedding the law codes as neural networks and only then does one apply the computer coding.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

There should be considered a limitation on transaction packet size to thwart hacking and identity theft.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

**INTERCONNECTION AND TRUST MECHANISMS** An intermediary firm can operate as an interconnecting trust mechanism that defines where the immutable state of the interconnected transactions is recorded. With hash-lock and time-lock mechanisms, that immutable state is recorded on the ledgers with the interconnected transactions. This is similar to bridging and sidechain approaches, where, however, some nodes (the verifiers-INTR) need to view and/or process the whole or a subset. This intermediary is referred to as a DLTAO ecosystem operator in accordance with OK HB 3279. Relevant provision from OK HB 3279 (DLTAO ACT): 5. The unalterable recordings of revenue collection and product tracking, by any state, county, or local governmental unit or agency of the State of Oklahoma, should occur through an ecosystem operator that has had prior successful participation in state and federal no-action processes pertaining to securities registration, exemption, regulation, and compliance requirements for persons or entities using distributed ledger technology assets offerings. In addition, an ecosystem operator should have a demonstrated capacity to assist in the incubation of distributed ledger utilities to avoid any monopolies forming; 6. The anticipated benefits of the development and use by the State of Oklahoma and its political subdivisions or agencies thereof of an integrated logistics, information, custodial, and payment tracking ecosystem, which uses hack-resistant distributed ledger technologies and a convertible virtual currency include: a. keeping customers' and any government citizens' or licensees' data secure and confidential, but available to ecosystem participants, stakeholders, regulators, and law enforcement communities on a transparent and need-to-know basis, as allowed or required by relevant laws or agreements between cooperating customers, persons, or parties, 13. "Distributed ledger technology asset offering agent" means a person who is appointed by a distributed ledger technology asset offering ecosystem operator and who is a licensed attorney with at least fifteen (15) years of law practice, in good standing with the Oklahoma Bar Association, and is appointed as counsel by the submission of entry of appearance documentation to the Oklahoma Department of Securities, the Office of Management and Enterprise Services, and the Oklahoma Tax Commission; 17. "Distributed ledger technology asset offering ecosystem operator" or "ecosystem operator" means a person or entity which employs at least one licensed Oklahoma fiduciary as its principal agent and which has general supervisory control over the subject ecosystem and provides to its customers smart contracts for electronic funds transfers, tax remittances, contract forms, escrow, custody, and goods and services tracking that become obligations for customers to pay the ecosystem operator in accordance with the terms of a designated and immutable smart contract; Prior to the acceptance by a state, county, or local governmental unit or agency of a vendor's bid or offer to contract, the prospective ecosystem or distributed ledger technology asset offering ecosystem operator shall show proof of having successfully participated in a state or federal convertible virtual currency and payment gateway demonstration and no-action processes. and 2. Demonstrate the proper procedural protocol publicly or privately in a test of the distributed ledger technology to the satisfaction of the state or federal securities regulators' compliance review processes. D. Preferences should be given to ecosystem operator applicants which have obtained United States Treasury, United States Department of Agriculture, and government charters, or certification as community development entities or credit programs which have maintained such status for at least ten (10) years and which are headed by licensed Oklahoma fiduciaries. A distributed ledger technology asset offering ecosystem operator shall: 1. Conduct its business with honesty and integrity; 2. Communicate with all stakeholders in a fair, clear, and non-misleading manner; 3. Conduct its business with due skill, care, and diligence; 4. Identify and manage any conflict of interest that may arise; 5. Have effective arrangements in place for the protection of stakeholders' and customers' funds; 6. Have effective administration arrangements; 7. Maintain all of its systems and security access protocols to appropriate international standards; and 8. When an ecosystem operator maintains a website and is required to make public disclosures,

make public any information or provide notice to the public on its website as required by law.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes. The storage of value on a digital wallet is not dependent upon the Internet and can be transferred to another customer's wallet using currently available technologies. To avoid double spending, INTR's Trak\$ can be transferred in this way using a QR code, bar code, RFID or NFC capability. The transferred value could be held in the wallet and redeemed for cash or deposited into a commercial bank account at the leisure of the customer. Then at such time as Internet services are resumed. The redemption or further transfer can occur, or any other required regulatory reporting can be accomplished.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes. Use Case- Bank handling letters of credit(LOC) Bank wants to offer DLT services to a wider range of clients including startups Currently constrained by costs & the time to execute DLT provides common ledger for letters of credit Allows bank and counter-parties to have the same validated record of transaction and fulfillment But if dispute arises, then there is recourse based upon relevant choice of law or by agreement Increase speed of execution (less than 1 day) Vastly reduced cost Dispute resolution and reversible transactions Licensed and Bonded Escrow Agents and Fiduciaries Oversee Compliance Use Case - Corporate Debt Bond Bank Holding a Corporate Debt Would Like to What? Pay vendors quickly for transactions validated by the client Allow the corporate client to see the payment is made Provide government with oversight of the process Reverse Transaction Based Upon Fraud or Mistake How? Distributed Ledger Technology provides a common ledger for recording the corporate debt/bond, Available to bank, corporate client, vendors and government INTR provides mechanisms for consensual settlement and dispute resolution Benefits? Speeds up vendor payments bigger net discounts Eliminates risk and accelerates decision making Owning bank can spread the cost across each market Transaction reversibility and Travel Rule adherence Fiduciaries ensure contractual and regulatory expectations Relevant provision from OK HB 3279 (DLTAO ACT): I. To form a smart contract or to obtain any services from the ecosystem, customers in a supply chain must agree to terms and fees for using the smart contract software, which may be established by the participating state agency, political subdivision, or tribal entity and the ecosystem operator who provides various services in exchange for the customer paying the fees to the ecosystem operator, as set forth in a smart contract agreement for services rendered as determined between the parties or by operation of the participating government agency, tribal entity, or political subdivision. J. Customers may purchase digital contracts and the negotiation of the charged fee in another digital contract, which is the smart contract, escrow, and accounting tool that determines the income going to the ecosystem operator for its services and that defines the ecosystem operator-to-customer and any controlling law or regulation affecting or specifying contractual relationships. K. The digital contract or smart contract shall determine how the ecosystem operator compensates the customer and how the customer compensates the ecosystem operator for goods and services. The contents of a digital contract may be determined by reference to existing terms administered by the ecosystem operator as an agent of a participating state agency, tribe, or political subdivision, but any participation by a tribal entity must be voluntary and as part of a memorandum of understanding or other appropriate agreement as provided by this act or by federal, state, or tribal law. A digital contract and payment to the customer by the ecosystem operator may include, but is not limited to, customer efforts as measured by volume of transfers or conversions, payment for the customer filling out a survey, or a referral fee for additional customers brought in by a customer. Services the ecosystem operator may provide to customers for which the operator is compensated may include such matters as identification, transfers, conversions, agreements, escrow, consent, due diligence, custody, taxation, or other matters. L. The ecosystem operator shall extract fees pursuant to the controlling law, regulation, agency rule, or digital contract account's defined terms, debited from the business's or customer's bank account as payment for the ecosystem operator's services. The defined terms for those services shall be found in the digital contract accounts or the relevant law or regulation affecting the specific agency, political subdivision, or tribal entity. M. The ecosystem operator's debits and credits shall be entered onto the immutable ledger in the form of a customer credit or debit to their digital wallets or corresponding bank accounts using automated clearinghouse services and application program interface. N. Compensation shall be paid to or by the ecosystem operator in United States dollars. Any fees the ecosystem operator charges for transfers, conversions, escrows, tax remittances, or other services performed in assisting in the execution of customers' transactions, or digital contracts entered between customers, shall be based upon a negotiated fee schedule, which shall be calculated, accounted for, tracked, and collected from any transaction between the customers, and a deduction shall be debited from the customers' accounts pursuant to an

agreement as memorialized in the smart contract account. Such fees charged may differ depending on matters such as the type of transaction..."

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

An effective CBDC will be interoperable to securely and efficiently interconnect diverse distributed ledgers. Interoperability between closed and permissioned digital silos becomes of paramount importance for guaranteeing a universal, unified, and non-segregated realm for distributed ledgers and multiple interoperable ledgers. An interledger solution is one that allows the interconnection of multiple ledgers, with flexibility for supporting innovation. Interledger approaches include 1) atomic cross-chain transactions, 2) transactions across a network of payment channels, 3) the W3C Interledger Protocol (ILP), 4) bridging, 5) sidechains, and 6) ledger-of-ledgers. All nodes have some level of access to the ledger. Trust is based on explicit factors in the system (e.g., transactions happening between the peers, behavior observed in the network), or on other implicit elements, such as business relationships between peers or any other criteria relating to the underlying application supported by distributed ledgers. All nodes agree to a protocol that determines the "true state" of the ledger at any point in time. The application of this protocol is sometimes called "achieving consensus." Unlike Ripple/XRP, Bitcoin, or Nxt, which are anonymous, and are inflexible unless forking, have no asset backing, do not protect their users, and are completely without recourse: the optimal ecosystem uses escrows as digital contracts and has central authorities who are licensed and bonded professionals and fiduciaries. Fiduciaries can intermediate to resolve disputes based on the Rule of Law and can reverse transactions if there are unlawful or mistaken actions taken by permissioned customers. The bridging approaches consider a consensus mechanism, such as Proof-of-Stake, Delegated Proof-of-Stake, or Proof-of-Authority among the bridge nodes used. The current, optimal interoperable capability involves Proof of Trust and can include paying fees to these bridging nodes for the interconnection services that they provide. Our pilot project in Oklahoma engages counties, schools, businesses, churches and individuals to cooperate as regulated nodes. [https://www2.aueb.gr/users/vsiris/publications/p30\\_interledger\\_approaches.pdf](https://www2.aueb.gr/users/vsiris/publications/p30_interledger_approaches.pdf) One DLT project INTR modeled on that received a no action reaction from the SEC is, Pocketful-of-Quarters. The developer sought to bridge the gaming and blockchain worlds by creating digital tokens that can be used interoperably on a virtual platform. The cross-platform currency also offered greater flexibility to developers over how they build, distribute, monetize and cross-market games, ultimately empowering them to create rich, new multiplayer experiences without losing creative and economic control to publishers. This gaming interoperability design can be easily repurposed to be used to interconnect disparate and siloed ecosystems or platforms with a CBDC. <https://www.prnewswire.com/news-releases/pocketful-of-quarters-officially-launches-with-first-and-only-compliant-and-interoperable-video-game-currency-for-the-metaverse-301485928.html> <https://www.sec.gov/divisions/corpfin/cf-noaction/2019/pocketful-of-quarters-inc-072519-2a1-incorrecting.pdf> "(T)here will be a correlation between the purchase price of Quarters and the market price of accessing and interacting with Participating Games; and PoQ will market and sell Quarters to gamers solely for consumptive use as a means of accessing and interacting with Participating Games" .<https://www.sec.gov/corpfin/pocketful-quarters-inc-072519-2a1> **INTEROPERABILITY**-The transfer can be facilitated by a third user, or fiduciary connector (INTR), maintaining accounts in both ledgers A and B. The idea is that the sender will transfer value to the connector in ledger A, and the connector will transfer the respective amount to the recipient in ledger B. Transferring and/or trading (or exchanging) value between chains. With transfer, value is portable, i.e., it moves from one ledger to another. This is achieved by having the "original" value (tokens) in the first ledger frozen or locked (or destroyed) and the "new" value (tokens) in the other ledger unfrozen or unlocked (or created). With trade (or exchange), value (tokens) on different ledgers are exchanged simultaneously, i.e., the transactions that move value (tokens) from one account to another on the same ledger occur in an atomic manner. Unlike the transfer of value, the exchange of value is dependent on the exchange rate of the tokens being traded. Transferring information or generic messages between chains, in a way that the information or messages on different chains are cryptographically linked. This is particularly useful in Internet of Things (IoT) applications to immutably record information on multiple ledgers in a manner that satisfies some dependency conditions and can allow correlation of custody, payment, service, information, and product transfer events.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Existential problems of climate catastrophe and economic collapse caused by technological innovations should be central in affecting design and policy choices related to any CBDC.

Our existential future is likely dependent upon financial and technological innovations to reduce atmospheric pollution that should be undertaken now. Over 11,000 scientists and numerous global assemblies warn that planet Earth is facing a climate emergency without enough being done. An immense increase of scale in endeavors to conserve our biosphere is needed to avoid untold suffering due to the climate crisis. Climate change threats are a national and a global security emergency analogous to a world war. Melting the ice caps may prove to be the greatest existential threat in the history of human civilization, which should make all other lesser concerns secondary. But the burden of reversing CO<sub>2</sub> buildup is falling on the nations disproportionately. If it will protect the planet's largest rainforest, Brazil wants to be paid upfront, but the United States wants to see results first before it advances funds. The United States and Brazil differ on how to finance. The Brazilian government has presented a new official goal for fighting deforestation in the Amazon -- a first for the administration of President Jair Bolsonaro. But critics say it's hardly enough, yet for reversing the accelerating destruction of the Amazon rainforest, finding the needed money might be the best bet for solving the climate-driven and anthropogenic extinction problems. President Biden has mobilized his entire administration to take on the challenges from every angle in a strategic, integrated way. Slowing climate change will require a comprehensive and coordinated "all hands on deck" approach. All Hands on Deck- The Creation of the Bank of England, a Financial Technology and Organizational Precedent for Dealing with Existential Crisis . England's crushing 17th Century defeat by France, the dominant naval power, became the catalyst for England rebuilding itself into a global power. However, the ability to construct this fleet was hampered both by a lack of available public funds and the low credit of the English government in London. To induce subscription to its bond program , the Bank of England was incorporated. The assets that England needed to rebuild its navy, so as to defend itself from France were there all along. It took the right law, organization, and a new financial technology, capable of attracting the needed capital, in order to have the needed funds pour into the coffers of the Bank of England . On 5-8-2022, the global cryptocurrency market cap was \$1.57 Trillion. Without intrinsic value or backing from defined assets, the investor network which upholds cryptocurrencies' value could divest. The value could all go away tomorrow, without even a bankrupt asset to be divided to show for it. But what if this 1.57T market cap could be repurposed using a new species of final technologies and organization and invested to save the rainforests? With a coordinated marketing campaign and a regulatory effort, funds derived from digital assets could be used for purchasing the rain forests from Brazil in order to help deal with global climate change. A Malthusian analysis concerns itself mostly with variables of food and geography. Published studies identify atmospheric pollution as the primary reason for an impending collapse and implicitly indicates more carbon sequestration and a negative carbon footprint as the cures. Recall that rationing and engaging the populace in an all-out defensive effort are the techniques of total war. President Biden is correct that an all hands approach is needed to combat and reverse CO<sub>2</sub> pollution. Ration cards in the WWI and WWII were a crude example of a track and trace management of the supply chain, implemented to ensure that the maximum effort was expended on the war effort. A platform using DLT and AI with incentives and disincentives, and one that protects legal and civil rights, could be deployed, one that can be quickly activated as the policy makers and population obtain the resolve to intervene in order to reverse what seems an inevitable environmental collapse. At the very least a rationing approach is an insurance policy to de-risk and reduce the likelihood of such an impending collapse.

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

A STATE REGULATED DISTRIBUTED LEDGER TECHNOLOGY MANDATE (Oklahoma Distributed Ledger Technology Asset Offering "DLTAO" ) Fiduciaries and Trusts- Contrary to the design of the thousands of "trustless" crypto projects, in a Proof of Trust (PoT) system peers can express opinions about each other and declare trust links within the system. The distributed ledger is the system of redundant recordings or validator nodes for an individual, institution, business or government entity, i.e. records asset and information transfer between participants. The ideal ecosystem design does not run with a Proof-of-work (PoW) system like Bitcoin or a Proof-of-stake (PoS) system like Nxt. Instead, transactions rely on a consensus protocol design in order to validate account balances and transactions on the system. The consensus design works to improve the integrity of the system by preventing double-spending. Trusted community institutions run the validator nodes. Trak\$- A programmable digital dollar and a smart contract ecosystem combining identity, consent and reversibility (Self>Trak\$, Smar>Trak\$ and Hoop\$). Trak\$>ATM LLC, is an INTR subsidiary, which will supply physical kiosks for digital asset processing, payment, and tracking; a public-private owned, cooperative utility providing electronic fund/info transfer, tax remittances, payment, and tracking for the unbanked. INTR has designed and tested multiple minimum viable products in the SEC Fin Hub sandbox. INTR was well on its way in

April 2022, to having a state law passed which would help clarify for the Oklahoma, federal and tribal regulators a system for government's using the managerial services and software of vendors supplying digital ledger technologies assets offering services, or as a fiduciary and agent of the state taxation authority to collect taxes.

[https://tulsaworld.com/news/state-and-regional/govt-and-politics/oklahoma-house-looks-to-cryptocurrency-technology-to-address-medical-marijuana-issues/article\\_4215457a-a483-11ec-8768-b3141dd2772b.html](https://tulsaworld.com/news/state-and-regional/govt-and-politics/oklahoma-house-looks-to-cryptocurrency-technology-to-address-medical-marijuana-issues/article_4215457a-a483-11ec-8768-b3141dd2772b.html) Oklahoma House Bill 3279, the Oklahoma Digital Ledger

Technology Asset (DLTAO) Act passed overwhelmingly in the House with a 75 to 12 bipartisan vote. <http://www.oklegislature.gov/BillInfo.aspx?Bill=hb3279&Session=2200>

Relevant provision from OK HB 3279 (DLTAO ACT):O. Tax remittances, withholding, reporting, or payments shall be determined by reference to the smart contract, and the ecosystem operator shall collect the same as an agent on behalf of individuals, businesses, government regulators, and taxing authorities. Regulatory Compliance as Key Performance Indicators 2001- INTR granted federal charter intertribal agency rights. 2002- INTR certified as Community Development Entity by US Treasury. 2016- INTR launched Trak\$ ATM as a pilot project. 2018- INTR General Counsel's Office participated in drafting legislation for the state of Oklahoma Legislature's Joint Committee on Medical Marijuana. 2019- March- Ok Tax Comm authorized INTR to collect cannabis taxes. April 2019- SEC releases "Turnkey Jet" No Action INTR-OPT filed an application for No Action with OK Dept. of Securities (ODS). Aug 2019- ODS referred INTR to SEC, then entered Corp Fin/Fin Hub No Action sandbox. Dec 2021- INTR presented an informal distributed ledger tech (DLT) demo to Jonathan Ingram, author of SEC Turnkey Jet no action position. Feb 2022- INTR presented a formal DLT demo to SEC director Valerie Szczerpanik. Mar 2022- INTR General Counsel drafted Oklahoma Distributed Ledger Technology Assets Offering (DLTAO) Act which passed with overwhelming bipartisan support (75 to 12). Apr 2022- HB 3279 assigned to Senate Commerce Committee, Chair accepted for hearing and vote. INTR's government affairs team withdrew HB 3279 from contention after the banking and cannabis lobby posed questions. The bill was withdrawn from the Senate Commerce Committee where it had been assigned.

<https://www.news9.com/story/62311237b446e00188a70be7/oklahoma-lawmakers-look-to-create-nations-first-marijuana-banking-system> The goal now is to involve more the banking, technology, and legal communities and integrate the lessons learned and reintroduce the modified DLTAO Act in the next session.

<https://www.cannabisbusinesstimes.com/article/does-oklahoma-have-answer-to-cannabis-banking/> INTR was modeled after the Federal Reserve and to be a part of its system. INTR has a duty to conform to the Federal Reserve's policies. Within the intertribal statute controlling INTR it states: "Upon determination by the Indigenous Nations Tribal Reserve Board that such action will be useful for the purposes for which it is established...it may... become a member of the Federal Reserve System."

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*Name or Organization*

*Industry*

Other: Intertribal Community Development Entity

*Country*

United States of America

*State*

Oklahoma

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Indigenous Nations Tribal Reserve (INTR): Regulatory Compliant Fiduciary and Intermediary --The INTR ecosystem was designed with permissioned and interconnected, interoperable “hoops” for use by citizens, governments and industries to support and enhance “... monetary stability, financial stability, and a safe and efficient payment system.” INTR has potential public and private benefits as a payment and logistical utility incubator. INTR was founded in 2001 and has pursued an Indian Country pilot project using distributed ledger technologies (DLT) for financial inclusion of Native Americans and their surrounding low-income communities beginning in 2016. We were persuaded by Vice Chair Lael Brainard’s numerous presentations on Indian Country and digital assets to contact the Federal Reserve. The gracious and kind responses from Vice Chair Brainard, the Minneapolis Center for Indian Country Economic Development and Megan Cruz of the St Louis Branch came swiftly and all directed INTR to respond to the CBDC paper with comments./// “Provide benefits to households, businesses, and the overall economy that exceed any costs and risks” INTR’s comments report on a multi-year evolution of designing and de-risking a minimum viable product for an Indian Country Credit Program using DLT. We have jumped through many hoops designing, then positioning to launch an optimal regulatory system for using DLT in order to provide for integration, interoperability and cross-jurisdictional cooperation. The free market encourages the creation of the right intermediaries. Non-monopolistic and existing legal and financial systems work best: licensed fiduciaries using regulated banks are a natural choice for trusted intermediaries. ///“Yield such benefits more effectively than alternative methods” Analogous to a digital form of money, INTR’s ecosystem consists of a programmable convertible virtual currency (CVC) (Trak\$), a digital contract escrow account (Smar>Trak\$), and a DLT identity account (Self>Trak\$) combination, with transaction reversibility and alternate dispute resolution or arbitration (Hoop\$).///“Complement, rather than replace, current forms of money and methods for providing financial services.” Instead of joining the thousands of unregulated token launches, INTR sought the direct guidance from the SEC Fin Hub/Corp Fin beginning in 2019, and from the Oklahoma Department of Securities (ODS) and Tax Commission (OTC) beginning in 2018. INTR found its design in these agencies’ legal and fintech sandboxes (digital dollar, tribal casino, industrial hemp, medical marijuana regulation and taxation, 501c3 donations, poker chip payment avatars, social media, cooperatives, and real estate/construction contracts ). ///“Protect consumer privacy”: INTR has designed, tested, and demonstrated with the guidance of state, tribal, and federal tax and securities regulators, a payment and tracking incubator, which uses a convertible virtual currency (CVC) and digital contracts within interoperable and permissioned “hoops” for identity protection. These interconnected circular designs might be useful to the Federal Reserve in evaluating an interoperable ecosystem for a CBDC, which extends and complements “...existing means of payment..” We have experimented and adjusted the design to reflect tribal, state and federal securities, tax, and financial regulators’ guidance on “...how to ensure a CBDC would preserve monetary and financial stability...” //Protect against criminal activity: We have observed others’ attempts to create both regulated and unregulated convertible virtual currency (CVC) designs (Libra, Ethereum, EOS, Ripple, Bitcoin, USDT, USDC, etc.) INTR vetted and incorporated at least a dozen foreign jurisdictions’ DLT regulatory designs on “...how to preserve the privacy of citizens and maintain the ability to combat illicit finance.” We have employed and investigated many tech providers, cryptocurrencies, and tested multiple DLT minimum viable products and designs. Much of what we found does not protect, rather the intended effect of these developers has

been to disrupt and to destroy long-standing legal relationships.// Broad support from key stakeholders: After working out the details of a payment and tracking system within the ODS and SEC FinHub sandboxes, INTR introduced HB 3279, the Oklahoma Distributed Ledger Technology Assets Offering (DLTAO) Act with bipartisan passage in the OK House (75-12). We withdrew the bill from OK Senate consideration for reintroduction next session. We determined that the stakeholders need to determine and better integrate the banking and Federal Reserve perspectives. (Throughout these comments, we will quote from the language of OK HB 3279, as the proposed law bears on the issues raised for comment.)

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

An iterative and alternative approach exploring a CBDC's potential benefits in a pilot project: banking the unbanked in Indian Country could positively achieve the Federal Reserve's CBDC goals. //INTR's charter goals overlap those of the Federal Reserve as we seek: "...how a CBDC could improve the safe and efficient domestic payments system." INTR's charter assignment is to "define and safeguard" an Indian Country fintech integration so as to bank the unbanked by using U.S. bank depositories for asset backing of the CVC. INTR proposes to use its CVC and DLTAO ecosystem designs to help demo and explore a United States CBDC design for potential properties, costs and benefits beginning with the Indigenous unbanked in Central Oklahoma. //A Federal Reserve CBDC would be a liability of the Federal Reserve, but commercial banks might not receive enough support were a CBDC only administered by the Federal Reserve. Thus, a CBDC by definition would tend to replace, rather than complement current forms of money and methods for providing financial services. INTR's intermediary approach with the unbanked will allow commercial banks to be used as depositories for purchasing and backing a CBDC. //"/Move fast and break things!" was the mantra of early tech innovators, but the federal securities regulators, financial agencies, and the U.S. Congress have pushed back against lawless tech firms. Benefitting the public interest and the Federal Reserve's remit is INTR's charter and statutory mandates. There are potentially great social and economic benefits in moving deliberately in accordance with the Rule of Law in order to protect the U.S. dollar and a stable monetary policy using DLT. Our evolutionary and iterative designs involve studying DLT failures. Regulatory agencies helped INTR's securities, organizational, and tech designs; now we seek the Federal Reserve's regulatory guidance.// In the DLTAO Act, HB 3279 drafts, we embedded federal securities laws into Oklahoma law through reference to INTR's no action features and by inclusion of the officially announced SEC no action positions. The reasons for proposing HB 3279 are: to provide a DLTAO regulatory framework, to thwart financial and criminal corruption, to collect taxes, to incubate DLT, and for financial inclusion of the unbanked.//A larger purpose is served by adapting a law first approach to distributed ledger technology (DLT) regulations. Typically, DLT transactions are immediately validated and cleared, then settled shortly thereafter, automatically without a central authority. A more optimal DLTAO ecosystem design should modify this unregulated and un-permissioned protocol with recourse, reversibility, and dispute resolution. Our design optimization calls for closed, but permissioned, and interoperable "Hoop\$", and uses a licensed fiduciary (INTR) and a stable token, Trak\$, which is a programmable U.S. dollar avatar backed by deposits in U.S. and/or state financial institutions.//The regulatory design strategy is intended to establish an optimal economic development utility incubator for solving universal and intractable problems such as dispute resolution, financial inclusion, tax evasion, and money laundering. To evolve such a universal capability one would do well to seek chaotic use cases that are complex, and then overlay a minimum viable legal, organizational and DLT product design solution. If the design involves a digital asset, the next step is the SEC Fin Hub sandbox. The multi-jurisdictional, tribal casino, cannabis/hemp regulation and tax remittance, cryptocurrency, and money laundering problems appeared to us as the worst regulatory problems with the most difficult DLT design challenges. We have sorted out the factual, legal, organizational, and tech details for several of those use cases and formally demonstrated the same by written submissions and live presentations in multiple instances to SEC Corp Fin/Fin Hub staff and to the SEC Fin Hub director, Valerie Szczepanik, on February 23rd, 2022.//Such an ecosystem as described in the OK DLTAO Act and presented to the SEC would "...not favor any policy outcome..." but could enable federal, tribal and state governments collaboration and cooperation in creating a CBDC minimum viable product for testing. An Indian Country pilot might provide a study for more efficient underwriting, tax, securities, and financial compliance using DLT for custody, payment, services and product/services tracking. Working together, multiple jurisdictions could integrate a federal, state, local, and tribal compliant digital payment landscape for the future, while fitting within the current SEC securities', UST, OCC, FinCEN, FDIC, and Federal Reserve monetary policies' envelopes.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Banking the Indigenous Unbanked: "MENDING THE HOOP" A pre-Columbian economic system, which some Natives referred to as the "Hoop" was long established before being broken. There are over 33,000 enrolled tribal members living in Central Oklahoma. Many are unbanked and nearly all live outside of their tribal jurisdictions. Indigenous Nations Digital Villages or "Indigivils" can be launched using a combination of tablets, apps, and special ATM's to bank the unbanked in remote places. Indigivils first launch is as a pilot project in Oklahoma and Cleveland Counties, which are not tribal lands included in the McGirt v. Oklahoma decision, but are rural, suburban and urban, former "Unassigned Lands."//INTR has authority to operate a Credit Program here in accordance with its tribal charter and the Oklahoma Indian Welfare Act. Both the statute and charter require INTR to use U.S. and state banks as depositories. INTR and its community partners proposed the Oklahoma Distributed Ledger Technology Assets Offering (DLTAO) Act, which was on its way to passage in April 2022. If the law passed, it could clarify for Oklahoma and its tribal governments a federal securities and BSA compliant system for governments using DLTAO vendors to bank the unbanked.//In articulating the collaboration of tribal and state in the proposed DLTAO Act, we have welcomed the leadership and words of support coming from the Federal Reserve's Vice Chair, Lael Brainard. She appeared and presented before our Oklahoma tribal communities in October 2021 at Oklahoma City: "As Native communities tackle these impediments to financial inclusion, collaborative efforts across a range of public-sector, private-sector, and nonprofit organizations can be helpful. As part of our mission to build a strong, inclusive economy, the Federal Reserve has a role to play in supporting economic growth and financial inclusion in Native communities."

<https://www.federalreserve.gov/news/events/speech/brainard20211013a.htm>

#### COLLABORATION TO HELP THE UNBANKED BY EXPLORING CBDC

DESIGNS--Electronic Fund and Information Transfer System Interchange: Integrate a federal, state, local, and tribal compliant digital payment landscape for the future, while fitting within the current US Treasury, SEC, and Federal Reserve monetary and securities policies. Define, integrate, and safeguard Indian Country distributed ledger technologies (DLT) within U.S. financial institutions to design, demonstrate, and explore a United States central bank digital currency (CBDC) creation for potential properties, costs, and benefits.

<https://www.federalreserve.gov/news/events/speech/brainard20220218a.htm>//Distributed Ledger Technologies(DLT) to Bridge the Indigenous Financial and Digital Divides Over 16 percent of Indigenous households were unbanked in 2019—three times higher than the national average. Unbanked Poor Problems: credit readiness, homebuyer education, lack of local bank branches, trust property as collateral, Native small businesses, financial literacy, and personal financial management skills. FinTech Solutions: Digital Assets Processors, Distributed Ledger Technologies, Smartphones/Tablets, Trak\$ ATM's, and Internet Access Indigenous Nations Digital Villages or Indigivils: Public/private sector cooperative associations can grow distributed ledger technology (DLT) networks for financial and digital inclusion by using available resources: technologies, organizations, institutions, and existing laws. Indian Country fintech utility incubator for financial and digital "...collaborative efforts across a range of public sector, private-sector, and nonprofit organizations..." Colonization Begins (1492): Breaking the Hoop • Indian Removal Act (1830): Remove Indians to Indian Territory (eventually becoming Oklahoma). • Worcester v. Georgia (1832): Marshall Court upheld Indigenous self-governance rights, but Jackson refused to enforce and began the Trail of Tears, forced removal of tribes to Indian Territory (Oklahoma). • Curtis Act (1898): Congress limits tribal self-governance in Oklahoma and takes away their lands again. Reversing Colonization & Mending the Hoop • OIWA (1936): Resurrected Oklahoma Indigenous powers of self-governance. • INDIAN SELF-DETERMINATION ACT (1975): Rejuvenated tribal governments by rejecting and countering previous bad policies. • IGRA (1988): Regulates Indian gaming to rejuvenate Indian Country. • POTUS (1999-2022): Presidential Memos on Tribal Consultation by Clinton, Bush, Obama, and Biden. • NABDA (2000): Encourages public/private partnerships and innovation. • McGirt v. US (2021): SCOTUS rules that portions of Oklahoma remain Indian land.

#### 4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?

Regulatory strategies demand that law code comes first and predetermines computer code. DLT can be designed with or without a central authority and by individuals or entities with no basis to trust each other. These networked back, decentralized, trustless systems like Bitcoin are intrinsically anarchic, unstable, and are not the needed design solutions for a U.S. CBDC, which could help with price stability or implementing U.S. monetary policies. Unregulated cryptocurrencies present legal and economic challenges of fluctuation, anonymity, and money laundering. At a minimum, the ideal ecosystem enforces regulated and stable transactions acceptable to the SEC, FinCEN, OCC, FDIC, and the Federal Reserve, thus requiring reversibility and trusted intermediaries or fiduciaries for AML, KYC, BSA. INTR acts through licensed and bonded fiduciaries and can serve in a central intermediary role determining who can set up a node and confirm transactions in a given

permissioned ecosystem. The more INTR was guided by regulators in its DLTAO design criteria, the more we explored an emerging concept which we discovered had gradually broadened into an “internet of regulation”. These regulatory strategies demand that law code comes first and legal code must dominate computer code. When the Oklahoma DLTAO Act was introduced in the OK House, there was immediate pushback against anyone suggesting monopolistic tech or government centralized control. OK HB 3279 has been influenced by public opinion and numerous corrections were made to satisfy critics. In addition to the HB 3279, multiple local, state, federal and tribal governments and agencies, including the SEC and branches of the state of Oklahoma government, have been contributing to our iterative DLTAO design evolution. The optimal CBDC scenario appears to indicate an ecosystem of trust. The ideal CBDC could require either directed or independent intermediaries serving as licensed fiduciaries or trustees in the public interest overseeing distributed ledger offerings. DLT ecosystems should have as their prime motivation, the reinforcement of trustworthiness and incorruptibility within the financial system. Using DLT to support and to effectively implement monetary policy in the pursuit of the Federal Reserve's maximum-employment and price-stability goals, the following criteria are central considerations. To Create Value or Issue Bank or Asset Backed Assets not Simply Vanishing Virtual or Network Backed Assets To Transfer and Record Value or the Ownership of Real Assets Based Upon Immutable Identity and Authenticated Agreements To Reverse Those Transfers of Value or Ownership of Tangible and Intangible Assets and to Resolve Disputes Between Parties to Transactions To Allow Owners of Assets to Exercise Certain Rights and Duties Associated With Ownership, and to Record the Exercise of Those Rights and Duties in Accordance With Choice of Law, Venue, and Jurisdiction PROOF OF WORK CONSENSUS DOES NOT SERVE THE NEEDS OF A CBDC INTR exercised its capability to act as a fintech utility incubator and intermediary with the recent passage of HB 3279 in the OK House (DLTAO Act). The CVC sandbox designs demoed to the SEC for casino and cannabis tax remittance and AML were a starting point for drafting the DLTAO Act. The ecosystem was designed with a programmable digital dollar and flexible logistical and payment tracking features tied to custodian/product/event/services. The purpose of selecting the use cases of federally legal industrial hemp and state-lawful, medical cannabis taxation and regulation in Oklahoma, was to find the most confused regulatory challenge for which to design a DLT solution. Then INTR took the best parts of that rigorous design to organize a regulatory solution in the form of a state statute integrating federal, state, and tribal laws. We experimented and found it impossible for certain tech designs to conform to the law. A U.S. CBDC using a decentralized cryptocurrency ecosystem and a trustless “Proof of Work” consensus mechanism like Bitcoin uses would negatively “... affect the Federal Reserve's ability to effectively implement monetary policy.” Poor Proof of Work Performance (Millisecond) Transactions Scalability is an often-cited concern of current blockchain technology. Bitcoin handles 7 TPS on average with greatly delayed confirmation times. Ethereum is much faster with 25 TPS, which pales in comparison to the 1,700 TPS achieved by VISA. Trustless Proof of Work Wastes Energy The current estimated annual electricity consumption of Bitcoin is estimated at 40.5 TWh, an amount above the annual consumption of entire countries, such as Argentina or Belgium.

##### *5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

The choice of CBDC designs will determine its negative or positive effects on financial stability. Insofar as it is possible, the goal should be to preserve the financial stability status quo with the use of any CVC or CBDC using DLT. The problem is that many of the cryptocurrency projects are disruptive and were particularly designed to compete or interfere with the U.S. central bank. The Federal Reserve promotes stability and reduces systemic risks and has done a remarkably good job if one looks at the challenges presented in 2008. Those features which helped to overcome that near meltdown should be bolstered and not disrupted. The advent of the first cryptocurrency project was Bitcoin in 2008 and it was specifically directed as an alternative to fiat currency and central banking. A CBDC with optimal design capabilities would dampen the effects of these disrupters and facilitate positive stability to counteract negative imbalances through: Monitoring- The ideal registry, custodian, and events correlations allow the granular monitoring of specific dollars, banks, people, locations, transfers, and industries and could be done in real time. Supervision at Micro and Macro Levels- Within an optimal DLTAO ecosystem, if a given commodity or service price level becomes unstable in a region, for example the price of asparagus grown in Central Valley, that event could be identified immediately, correlated and reported to the party with the need to know. This would reinforce the Fed's capability and “...promotes the safety and soundness of individual financial institutions and monitors their impact on the financial system as a whole, while helping to serve the Federal Reserve Charter purposes of “... consumer-focused supervision and examination, research and analysis of emerging consumer issues and trends.” Cryptocurrencies and Stable Coins Provide No Consumer Protection and Have High Run Risk: Most cryptocurrencies and stable tokens are not asset

backed nor do they have guaranteed or audited deposits. The regulated stable coin must be asset backed within insured U.S. depository institutions, which are subject to appropriate supervision and regulation, at the depository institution and the holding company level. Payment System Risk: Wallet providers would be subject to appropriate federal oversight. In addition, any DLTAO ecosystem operator as supervisor of CVC issuance must meet appropriate risk-management standards. The state of Oklahoma legalization of medical cannabis presented regulatory chaos and provided the opportunity for us to design a complete DLT solution for an intractable regulatory problem. The DLTAO Act was drafted to reduce the chaos of an unregulated cannabis supply chain. Engagement in US and Abroad- The design elements could be broadened to include most other logistical and payment challenges. Relevant provision from OK HB 3279 (DLTAO ACT): AS INTRODUCED An Ac relating to technology; creating the Oklahoma Distributed Ledger Technology Assets Offering Act; providing legislative findings; defining terms; authorizing state to develop and use distributed ledger technologies; requiring certain software; requiring certain security and legal requirements; permitting use of certain smartphone applications; authorizing additional uses; requiring certain software features; limiting use of convertible virtual currency; prescribing value of convertible virtual currency; providing requirements for digital and smart contracts; requiring a digital identity and wallet; prohibiting use of convertible virtual currency as an investment; requiring use of decision tree; requiring separate digital contract to charge a fee; prescribing procedure for payment; requiring ecosystem operator to collect fees and taxes; requiring ecosystem operator to perform certain accounting; prescribing method of compensation; requiring ecosystem operator to provide certain information; requiring the Oklahoma Tax Commission and Office of Management and Enterprise Services to make certain determinations; authorizing the Tax Commission, Office of Management and Enterprise Services, Secretary of State, and State Treasurer to promulgate rules; allowing payment of taxes from certain sources; permitting Tax Commission to appoint agents for certain purposes; creating requirements for distributed ledger technology asset offering agents; creating requirements for distributed ledger technology asset offering ecosystem operators; authorizing the Tax Commission and Office of Management and Enterprise Services to promulgate rules to validate transactions; allowing certain contracts; allowing use of memorandums of understanding; allowing certain working groups; prohibiting certification as a class action;

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

The ideal CBDC is not disruptive, but it harmonizes with existing regulatory and financial systems. Why is digital currency not widely used? lack of regulation unstable value slow transactions stigma from use in money laundering, tax evasionAn optimal CBDC can be used readily as digital contracts built to protect users and the law. regulated and protected by international, federal, state, and tribal laws always worth \$1 and 100% reserve backed in US banks or as a CBDC closed loop payment mechanisms that are fast, efficient, and safe prevents cybercrime, money laundering, and tax evasion Regulated Convertible Virtual Currency Reportedly, cyber criminals will steal over \$6 Trillion in 2021, exceeding the GDP of Japan. \$USD backed, smart money can be used with a mobile app or card so as to prevent cybercrime and to collect taxes. Profits should fund sustainable community development in rural, low-income, and minority communities. Problem: US agencies struggle with digital currencies as governments, consumers, and businesses seek a safe, usable option. Solutions: select regulators opinions on CVC's- An optimal design is that of a regulated, reserve backed, stable digital currency intelligently built to protect privacy, law, people and their rights. "...our current payment mechanisms, domestically and internationally, have inefficiencies, those inefficiencies are the things that are driving the rise of bitcoin" - Former SEC Chairman Clayton (November 23, 2020). Despite its recent rise, Bitcoin price volatility, slow transactions, lack of regulation, high power needs, and illicit activity problems, all limit mainstream use. Satoshi Nakamoto ushered in the "Internet of Value". Mark Zuckerberg advocated for the adoption of Libra and Diem for his personal "Internet of Money". A CBDC with an intelligent design could incubate an "Internet of Regulation" capable of reinforcing legal norms. "...(P)rivate digital currency-based payment systems could magnify concerns surrounding illicit activity and consumer risk" - Federal Reserve Governor Brainard (February 5, 2020). CBDC transactions must be federally reported. The ecosystem operator as a fiduciary and intermediary, ideally collects and remits taxes as it flags and reports illicit activities. Encryption and distributed ledger technology eliminate common consumer vulnerabilities "...if we really think the crypto world is going to be part of the future, it needs to come inside of the public policy envelope." -Gary Gensler, SEC Chairman (October 15, 2018) According to US Treasury Secretary Janet Yellen "...regulating institutions that deal in bitcoin...is certainly important." (February 18, 2021)REGULATORY COMPLIANT DLT From 2016 to 2021, the United States Securities and Exchange Commission has provided guidelines for intelligently designing a CVC. SEC Commissioner Hester Peirce observed that "...the opportunity to develop multiple regulatory solutions to a single problem, is a feature of the United States' own system" (July 30, 2019)USE CASE | LAW | ORGANIZATION | TECH● Since 2016, INTR has modeled, developed, and integrated legal, DLT, and organizational sandbox designs to explore a programmable digital

dollar design for the unbanked, casino, cannabis, and crypto use cases in order to comply with federal, tribal, and state policies. • INTR is designed to enable federal, tribal, and state governments to efficiently ensure legal, tax, securities, and financial compliance by using DLT for custody, payment, and product/services/event tracking solutions. • We adjust our ethical, organizational, and tech protocols with key agencies' guidance and regulations, to include S.E.C. Fin Hub, the U.S.T. and the Federal Reserve. Proof of Trust and an Optimal CBDC. The Proof of Trust protocol permits transactions to be gathered sequentially and recorded; cryptographically validated in chronological order; and allows the resulting ledger to be accessed by different servers. Unlike the thousands of unregulated, network-backed crypto- INTR has not issued any tokens or posted a public web site and has only moved value in the SEC sandbox in demos before Corp Fin and Fin Hub staff lawyers and directors. INTR's "Trak\$" CVC design will be asset backed and guaranteed in U.S. banks.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

The Rule of Law is the socio-economic tool lacking from multiple unregulated cryptocurrencies. Traditional societal, legal, and economic values seem almost everywhere absent from the Internet. These simple tools that we use every day to enforce the law, protect consumer vulnerabilities and to attain the benefit of any contractual bargain are identity, informed consent, and dispute resolution. Any CBDC connected to the Internet should be a regulatory design with effective and reliable protections for consumers. If there is to be a CBDC with correlative rights and duties, a new covenant for an American version of World Wide Web citizenship should be explored. If we begin migrating deliberately onto the Internet our brick-and-mortar laws, customs, and norms, the substantive and procedural laws should be easily enforceable within and throughout the Internet by regulators and the courts. Many of these promoters and developers with their thousands of unregulated cryptocurrencies have announced a goal of anarchy calculated to disrupt and dominate domestic and international economic relationships. The stated purpose has been to replace economic reality and trust with a trustless virtual society whose starting point is computer code. While in the SEC sandbox, INTR was guided to create the basic tools for mitigating adverse impacts of a CBDC on the financial sector. Those tools do not begin with computer code, but are customary, legal and inherent in our everyday lives within civil society and are found in our legal codes and precedents. Digital Contract to Verify Consent-Smar>Trak\$ Example: – Defines consent to agreement or contractual conditions under which corporate bond transfer occurs and uses a decision tree for specifying agreed to terms. Business Rules or Governing Laws Agreed to within any Contract are Entered upon a Decision Tree and are Embedded in the Distributed Ledger & Executed with the Transaction Mutual Consent is Given by the Parties to the Agreement upon an Easy to Read Decision Tree Format which is Verifiable and Signed Encoded in Programming Language Reflects the Consent of the Parties to the Enforceable Agreement, to Include Provisions for Breach, ROI, Liquidation, and Bond Discharge Terms. Digital Contract to Verify Identity-Self>Trak\$ Ledger is shared, but participants require privacy and governments require identity reporting for Travel Rule compliance. Solution is to use bonded and licensed fiduciaries as trusted intermediaries for Regulatory and Contractual Compliance and Certainty. Regulatory needs – Transactions to be regulated – Identities of the parties must be linked to a transaction and known by a fiduciary as intermediary so as to Comply with Banking and Securities Laws. Transactions must be authenticated and identities verified with 2FA, biometrics, etc. Identities are Protected by Distributed Ledger Technologies. The use of cryptography is overseen by licensed and bonded fiduciaries engaged as trusted intermediaries supervising all suspect transactions for compliance, and are essential to these regulated processes, thereby fulfilling commercial and regulatory expectations so as to reduce transaction risks and to increase voluntary adherence to the Rule of Law. Provisions relative to a regulatory tool kit quoted from OK HB 3279 (DLTAO ACT): I. Every distributed ledger technology asset offering ecosystem shall be designed in such a way that it becomes a public utility for tax remittance, payment, custodian and product or service information transfer and revenue sharing, and to become autonomous and disintermediated by using programmable smart contracts managed by algorithms and encoded with relevant state, county, local, tribal, or federal laws and regulations for taxation, accounting, escrows, remittances, custody tracking, and other applications. J. The initial use case shall be a distributed ledger technology asset offering ecosystem which shall provide an integrated logistics, payment, and tax recording and remittance system for the use of government taxing and regulatory authorities that will also provide for customer payment and custody transfers using escrow and smart contracts for services and goods at the retail and wholesale levels among producers, merchants, and customers. K. Every distributed ledger technology or fintech vendor shall tailor its technology to comply with and conform to the state's records laws and regulations for dispute resolution, evidentiary proceedings, money services businesses, tax revenue remittance, tax reporting, securities, and escrow.

*8. If cash usage declines, is it important to preserve the general public's access to a form of*

*central bank money that can be used widely for payments?*

AN OPTIMAL USE CASE FOR A CBDC DESIGN AND LAUNCH TESTING: Banking the Indigenous Unbanked: A minimum viable product for a payment and data network using specially configured ATM's and distributed ledger technologies for the Indigenous unbanked, should have the least regulatory friction and the greatest government and financial community support. The social media responses, focus groups, mainstream media and legislative feedback from introducing HB 3279 (OK DLTAO Act) indicate that everyone wants cash left in the system. A cash dispensing and acceptance capability launch will require physical locations with ATM branches which take and dispense cash. The long-term objective is a CBDC design. We might have created a minimum viable product (MVP) design for a CBDC in the initial DLTAO Act phase. However, this phase involving building out ATM's and their physical branch locations should further reveal the optimal design and deployment which will allow cash transactions. According to the paper, a CBDC should be "... privacy-protected, intermediated, widely transferable, and identity-verified." The intermediated model suggested in the paper would best facilitate INTR's existing privacy and identity-management design frameworks, allow innovation; and reduce disruptions to U.S. monetary policy. "(T)he private sector would offer accounts or digital wallets to facilitate the management of CBDC holdings and payments." If the unbanked are to be included financially, cash transactions can be cleared and settled automatically but reports must be filed with OCC or FinCEN of cash transactions exceeding \$10,000 (daily aggregate amount), and suspicious activities reported that might signal criminal activity (e.g., money laundering, tax evasion) INTR would ideally be in a position, vis-a-vis, state operations to support state and federally chartered commercial banks by making deposits in those institutions for backing the CVC with bank assets. The proposed OK DLTAO Act provides for deposits for asset backing in local banks. Moreover, tribal government or international financial operations would best be backed by the Federal Reserve issued CBDC. The proposed bill received the greatest group opposition from the State Banking Department at the last hour before the matter was to go to the Oklahoma Senate Commerce Committee vote. This opposition emerged after multiple attempts were made over several years to inform the state agency concerning the nature of OK HB 3279 and those engaged in its advocacy. Relevant provision from OK HB 3279 (DLTAO ACT): "(M)aking cashless purchasing easier with biometric identification and database matching and providing for the availability of easy digital asset payment systems, which can convert cash, bank debit account or checking deposits, and credit cards to a digital asset representing as a programmable digital dollar,"

9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

WITHOUT THE FEDERAL RESERVE OVERSEEING CBDC DEVELOPMENT, THERE WILL BE CONTINUOUS NONCOMPLIANT EXPERIMENTS, WHICH VIOLATE SECURITIES LAWS AND THE TRAVEL RULE Devolving Down to Economic Anarchy • Bitcoin -- "Nakamoto" (2008) <https://bitcoin.org/bitcoin.pdf> • Ethereum -- Buterin (2013) <https://ethereum.org/en/whitepaper/> • Ripple/XRP -- Schwartz (2014) <https://www.allcryptowhitepapers.com/ripple-whitepaper/> SEC Regulatory Framework • Former Chairman Jay Clayton (Dec 2017): <https://www.sec.gov/news/public-statement/statement-clayton-2017-12-11> • Former Director William Hinman (June 2018): <https://www.sec.gov/news/speech/speech-hinman-061418> • FinHub created (Oct 2018): <https://www.sec.gov/press-release/2018-24> TurnKey Jet: Jonathan Ingram, <https://www.sec.divisions.corpfin/cf-noaction/2019/turnkey-jet-040219-2a1.htm> Valerie Szczepanik of FinHub (March 2019): Explained at South by Southwest (SXSW) in Austin, Texas that the SEC's existing securities laws may regulate certain types of stable coins: "So, you can call it a utility coin, call it a stable coin, call it a consumptive coin or some other coin. We're going to look at the characteristics. What's the economic reality? What's happening with the transactions involving the coin? And we'll give it the label that it deserves under the law." <https://decrypt.co/5940/securities-czar-stablecoins-might-be-violating-securities-laws-10> • Libra (June 2019) -- Zuckerberg -- "The world truly needs a reliable digital currency and infrastructure that together can deliver on the promise of 'the Internet of Money.'" • Pocketful of Quarters (July 25, 2019) -- Jonathan Ingram, <https://www.sec.gov/corpfin/pocketful-quarters-inc-072519-2a1> • Renegade Panda (July 30, 2019) -- Commissioner Hester Peirce, <https://www.sec.gov/news/speech/speech-peirce-073019> Optimal Distributed Ledger Technology Ecosystem Designs. Any of INTR's progress has been evolving in an iterative, trial and error process. The project always proceeds with law first and combines law practice and distributed ledger technologies. We use behavioral code, law code, and computer code combined and methodologically resolved. Use case, law, and tech combined is one way of expressing this neural, jural, computational parallel to fact-law-tech. Proceeding with law first has proven to be a superior method for legally compliant and socially beneficent technologies designs. INTR began to develop and design this law first technique, fitting it within regulatory

parameters for DLT and AI, with the guidance and oversight of local, federal, state, and tribal government agencies. Beginning in 2018, INTR entered the securities sandbox with the U.S. Securities and Exchange Commission, Corp Fin/Fin Hub, and the Oklahoma Department of Securities. This four-year process has culminated in INTR, giving optimally compliant, distributed ledger technology demonstration presentations to the SEC Corp Fin/Fin Hub staff attorneys. SEC Director Valerie Szczepanik attended INTR's most recent DLT demo, which was held on February 23rd, 2022. Inspiration and invitation for SEC Engagement- In July 2019, SEC Commissioner Hester Peirce gave her "Renegade Panda" speech in Singapore, calling for cross-border regulation of digital assets and announcing the formation of Fin Hub. As Commissioner Peirce observed: "In the U.S., we often refer to our states as 'laboratories of democracy.' Instead of implementing all policy at the federal level, different states try different policies. Policies that prove to be highly effective can serve as models for federal level policy and can inform the development of policy by the other states." SEC Commissioner's Call to Action: INTR immediately sent a letter to SEC Fin Hub for consideration in helping to realize a "Renegade Panda" solution. INTR has four years of sandbox designs with government agencies and close, iterative coordination with Fin Hub, under the watchful guidance of Corp Fin lawyers and staff. Now INTR suggests it should continue striving for an optimal cross-jurisdictional regulatory and institutional response, such as Commissioner Peirce envisioned and with the Federal Reserve's input. INTR has attempted to foster innovation and competition by borrowing the best DLT practices and by incubating new regulatory evolutions within the State of Oklahoma and Oklahoma Indian Country, two of the "laboratories of democracy."

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

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Commissioner's Call to Action: INTR immediately sent a letter to SEC Fin Hub for consideration in helping to realize a "Renegade Panda" solution. INTR has four years of sandbox designs with government agencies and close, iterative coordination with Fin Hub, under the watchful guidance of Corp Fin lawyers and staff. Now INTR suggests it should continue striving for an optimal cross-jurisdictional regulatory and institutional response, such as Commissioner Peirce envisioned and with the Federal Reserve's input. INTR has attempted to foster innovation and competition by borrowing the best DLT practices and by incubating new regulatory evolutions within the State of Oklahoma and Oklahoma Indian Country, two of the "laboratories of democracy."

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Relevant provision from OK HB 3279 (DLTAO ACT): A. For convertible virtual currency designed for the state and its political subdivisions, an entity operating an ecosystem, and any entity affiliated with the ecosystem operator, shall not use any proceeds from the convertible virtual currency sales, purchases, transfers, or conversions to develop the ecosystem, applications, or platforms referenced by this act, which shall be fully developed and operational at the time of any convertible virtual currency transfer or conversion. B. The convertible virtual currency designed for the state and its political subdivisions shall be exclusively marketed to customers and immediately usable for its intended function or functions at the time it is purchased, sold, transferred, or converted and not with any potential for the increase in the market value of the convertible virtual currency. C. The ecosystem operator shall restrict sales, purchases, transfers, and conversions of the convertible virtual currency to ecosystem digital wallets only. D. Any customer who holds convertible virtual currency designed for the state and its political subdivisions may only transfer or convert the convertible virtual currency at the face value of One United States Dollar (\$1.00) per convertible virtual currency to another ecosystem-approved wallet. E. The operator of the ecosystem shall sell, purchase, transfer, and convert the convertible virtual currency designed for the state or its political subdivisions at a price of One United States Dollar (\$1.00) per convertible virtual currency throughout the life of the program, and each convertible virtual currency shall represent an ecosystem obligation to convert or transfer the convertible virtual currency at a value of One United States Dollar (\$1.00) per convertible virtual currency. F. Convertible virtual currency designed for the state or its political subdivisions shall be fully backed by United States dollar assets deposited in United States financial institutions. G. Selling, buying, converting, or transferring convertible virtual currency designed for the state or its political subdivisions for less or more than One United States Dollar (\$1.00) shall be technologically impossible. A. Digital contracts or smart contracts used by this state and its political subdivisions shall be programmed for accountancy, identity, regulatory permissibility, and legality, credit verification, product location, work performance, customer status, agreements, and various relationships as conditions precedent to escrowed funds release. B. Smart contracts shall track performance from inception to completion and legally satisfy the release from escrow, which initiates a convertible virtual currency transfer. C. The ecosystem network provided for the benefit of state agencies, political subdivisions, and tribal-level entities on a voluntary basis shall be controlled and regulated by an electronic funds transfer system interchange. D. Anyone who interacts with the ecosystem shall have a digital identity and wallet which shall be a precondition to initiating a convertible virtual currency transfer. E. Any transfer of convertible virtual currency shall be in accordance with the Travel Rule as defined in Section 4 of this act. F. Customers shall agree with a conspicuous electronic signature declaring that they are acquiring the convertible virtual currency for a consumptive purpose and not as an investment, nor with an expectation that the convertible virtual currency shall earn profits based upon the activities and efforts of third parties. G. Convertible virtual currency functionality shall always be associated with a digital contract, which shall determine the terms of how, when, where, and to whom any convertible virtual currency is transferred or converted by an ecosystem operator. H. Before any transfer, purchase, sale, or conversion of convertible virtual currency is finalized, the customer shall first enter decision tree terms to show mutuality of consent between customers. I. To form a smart contract or to obtain any services from the ecosystem, customers in a supply chain must agree to terms and fees for using the smart contract software, which may be established by the participating state agency, political subdivision, or tribal entity and the ecosystem operator who provides various services in exchange for the customer paying the fees to the ecosystem operator, as set forth in a smart contract agreement for services rendered as determined between the parties or by operation of the participating government agency, tribal entity, or political subdivision. J. Customers may purchase digital contracts and the negotiation of the charged fee in another digital contract, which is the smart contract, escrow, and accounting tool that determines the income going to the ecosystem operator for its services and that defines the ecosystem operator-to-customer and any controlling law or regulation affect

*12. How could a CBDC provide privacy to consumers without providing complete anonymity*

*and facilitating illicit financial activity?*

Properly configured Distributed Ledger Technologies (DLT) have great promise as "truth machines" to provide privacy and could help deal with federal, state, and tribal government designs and regulation of a CBDC to prevent illicit financial activities. Currently, there are many controversies, illegalities, and abuses concerning cryptocurrencies and blockchains. There have emerged from blockchain businesses a plethora of Ponzi's, scams, and money launderers. Securities status and Banking Secrecy Act legalities are proper concerns for governments and their citizens. INTR's goal is to combine the best existing legal and managerial practices, and to operate in accordance with the European Union's (EU) General Data Plan Regulation (GDPR). ("The request for consent shall be presented in a manner which is clearly distinguishable from the other matters.") It should be clear to any participant what data processing activities are intended to be carried out, which grant the subject an opportunity to consent to each activity, separately and individually. Relevant provision from OK HB 3279 (DLTAO ACT) concerning how a CBDC could provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity? : 3) holding down compliance costs and allowing legal transactions at a lower price point, and (4) increasing logistical velocity and improving quality and quantity in supply chains by reducing delivery time, increasing specific product availability, and facilitating predictive, just-in-time production, processing, and merchandising, d. enhancing the stability of any legal market by: (1) using the cashless, electronic fund transfer of digital assets for all transactions between all parties within the specified community, including employees, to maximize micropayment capabilities and to create a maximally productive and legally adherent business community, (2) reporting shrinkage and lost product in the supply chain at any point and identifying culprits, (3) complying with the Anti-Money Laundering and Know Your Customer provisions of the federal Bank Secrecy Act, and the Suspicious Activity Reports of the United States Treasury Financial Crimes Enforcement Network, (4) increasing data collection for business owners and policymakers at a lower cost, thus reducing administrative compliance overhead, and (5) automating periodic data reporting volume and tracking data from point-of-sale systems, thereby providing policymakers and regulators with real-time data that predicts black market emergence, e. generating statistical data for decision-making by: (1) allowing designated agency or authorized political subdivision personnel to create surveys and order data sets, (2) allowing digital asset micropayments to obtain survey reporting participation, thereby reinforcing research efficacy, (3) establishing and collecting Health Insurance Portability and Accountability Act of 1996 (HIPAA) compliant, self-reported, voluntary patient reviews, and correlating and tracking specific products for their physiological and psychological efficacy, thus enabling patients, health care providers, labs, processors, and producers to better calibrate and correlate their related choices, and (4) giving policymakers empirically based and broad statistical samples based on surveys, f. optimizing the remittance, accounting, and reporting of tax revenue by: (1) tabulating financials for businesses and regulators and making data available to business owners and government agencies in real time and on a need-to-know basis, while using data privacy best practices, (2) allowing regulators to calculate business or activity density, estimate illegal activity, and model taxation rates to compete with and minimize black market activities, (3) monitoring consumer price sensitivity to allow for appropriate modification of taxation policy, and (4) keeping retail prices below the threshold consistent with best practices for preventing illegal activities,

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Relevant provisions from OK HB 3279 (DLTAO ACT): BE IT ENACTED BY THE PEOPLE OF THE STATE OF OKLAHOMA: SECTION . NEW LAW A new section of law to be codified in the Oklahoma Statutes as Section 12001 of Title 74, unless there is created a duplication in numbering, reads as follows: This act shall be known and may be cited as the "Oklahoma Distributed Ledger Technology Assets Offering Act". SECTION . NEW LAW A new section of law not to be codified in the Oklahoma Statutes reads as follows: The Legislature makes the following findings concerning the necessity for the Oklahoma Distributed Ledger Technology Assets Offering Act: 1. For the immutable recording of identity, contracts, and payments, as well as protocols that govern the production, distribution, and consumption of goods and services in a digital economy, distributed ledger technology assets offering ecosystems afford the most efficient, effective, and transparent method of achieving such, necessitating a proactive strategy to create, maintain, and advance the regulation of Internet activities; 2. Especially configured and government-regulated blockchain and distributed ledger technologies have emerged as critical solutions to many Internet crimes, cyberwarfare, tax revenue collection, product diversion, state and non-state acts of terrorism, money laundering, foreign interference with information technologies, and corruption problems; and in view of such, the State of Oklahoma has the potential to foster an Internet of regulation and to create new forms of decentralized platforms and distributed applications that have advantages over the current centralized Internet platforms and applications; 3. The State of

Oklahoma has the power and opportunity to realize its potential to become a global leader and a center for companies and entrepreneurs that seek to utilize distributed ledger technology systems to power blockchain- and distributed-ledger-technology-based business models, social media, and governmental systems, all of which will drive innovation within the state and give the State of Oklahoma an economic opportunity and global advantage to develop local economies, create new jobs, and export locally developed technologies; 4. Oklahoma's many sovereign entities and governmental units are not optimally integrated or united in law enforcement, Internet regulation, or first-responder efforts. Distributed ledger technology assets offerings, digital contracts, and immutable identities can enable precise financial auditing and the coordinated tracking and tracing of the activities of criminal elements, cyber incursions, and organized crime, making it more difficult for these criminal and terrorist elements to be able to hide their activities. These same capabilities will augment, facilitate, and integrate the protection of public safety and can immediately help first responders to identify and meet the needs of the citizenry, especially in victim identification, triage, treatment, search-and-rescue functions during natural and man-made disaster events, such as pandemics, tornadoes, and floods, and also will assist in detecting and preventing foreign military cyber and signals intelligence operations;

*14. Should a CBDC be legal tender?*

CBDC should be designed as legal tender. Exceptions could be made to limit the types of purchases and the nature of debtor payment could be controlled so that a CBDC would be difficult to use for crime. Moreover, having the capability of converting the cash transaction to a commodity using a CVC has ramifications for long term capital gains versus short term. The interface between the convertibility of the asset from currency to commodity seems to have broader ramifications for fiduciaries and financial products. INTR presented the following donative and commodity use case to the SEC Fin Hub on 2/23/2022. Dona>Trak\$: Digital contract that tokenizes a tribal casino customer's donative tax deduction on interest earned on assets escrowed in an attorney trust account. Interest is derived from storing a prepaid value using the convertible virtual currency (CVC) Trak\$ as a commodity and as an IRS 501c3 donor credit recorded as a digital contract (Dona>Trak\$). Escrowed by a tribal casino on behalf of a customer. Escrow services offered by the Oklahoma Bar Foundation (OBF) for member attorneys as a tax advantaged transaction deposited into a trust account pursuant to the OBF program known as- Interest on Lawyers Trust Accounts (IOLTA). The donor acquires the CVC or Trak\$ as part of a distributed ledger technology assets offering, with the CVC used as the digital dollar avatar backed by U.S. dollars in U.S. banks. Such an arrangement might drive funds into public purposes and establish reserves and equities which lend to financial stability. Although the DLTAO Act was written agnostic of any cannabis use case, when it was revealed that the ecosystem had particular relevance to regulate cannabis, a groundswell of interest ensued. The bill became highly controversial and motives surfaced relating to those engaged in tax evasion (one estimate was that as much as \$100,000,000 in cannabis taxes were not being paid). OK HB3279 benefits: promotes consumer protection and community development through consumer-focused supervision and examination, research and analysis of emerging consumer issues and trends, community economic development activities, and administration of consumer laws and regulations

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

NO. Beginning in April 2019, INTR submitted interest bearing digital dollar designs to state and federal securities regulators as part of no action applications. We proposed a token which would attract more holders and it would be backed by assets like Treasuries and blue-chip stocks so that it could gain in value to offset inflation. Both securities agencies, the S.E.C. Fin Hub and Oklahoma Department of Securities, rejected a digital dollar design which accrued in value or had an ROI. Why not? The basic CBDC should not compete with bank interest rates. The CBDC can be an avatar for the U.S. dollar and operate like cash and not pay interest, otherwise it could compete with not only banks but US Gov't securities. The U.S. digital dollar's value should be neutral and truly reflective of the U.S. cash dollar design, A key function of the Federal Reserve is to "...facilitate U.S. dollar transactions and payments..." The U.S. dollar does not pay interest and a CBDC that pays interest works more like a bond or stock than it does a currency. How? The measure of the dollar's purchasing value as it relates to the CPI and inflation calculator is a natural function of fiat currency inflation and the Federal Reserve has a predictable mechanism for the control of inflation by adjusting interest rates. Other CBDC related products which accrue interest could be devised which involve tokenization to increase access. For example, treasury bonds could be tokenized and purchase of treasuries is an existing strategy of many to hedge against inflation. To give greater access to the retail sale of treasury bonds by tokenization and DLT asset offerings could be a product that the U.S.T. and the Federal Reserve might consider. The root idea behind INTR's internet of regulation approach is to not disturb

existing systems, like the cash dollar or digital dollar systems. INTR would support the Federal Reserve function of fostering a payment and settlement system safely and efficiently through services to facilitate transactions and payments. Coders and data architects should be led by lawyers and behavioral economists so as to mimic existing economic systems in order to achieve stability, control, and to avoid disruption. The best practice in designing virtual economic systems is to have the major premise be the fact/law/policy and the minor premise is the tech. This can be described as a neural-jural-computational process and consists of migrating the relevant law(s) onto the Internet and embedding the law codes as neural networks and only then does one apply the computer coding.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

There should be considered a limitation on transaction packet size to thwart hacking and identity theft.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

**INTERCONNECTION AND TRUST MECHANISMS** An intermediary firm can operate as an interconnecting trust mechanism that defines where the immutable state of the interconnected transactions is recorded. With hash-lock and time-lock mechanisms, that immutable state is recorded on the ledgers with the interconnected transactions. This is similar to bridging and sidechain approaches, where, however, some nodes (the verifiers-INTR) need to view and/or process the whole or a subset. This intermediary is referred to as a DLTAO ecosystem operator in accordance with OK HB 3279. Relevant provision from OK HB 3279 (DLTAO ACT): 5. The unalterable recordings of revenue collection and product tracking, by any state, county, or local governmental unit or agency of the State of Oklahoma, should occur through an ecosystem operator that has had prior successful participation in state and federal no-action processes pertaining to securities registration, exemption, regulation, and compliance requirements for persons or entities using distributed ledger technology assets offerings. In addition, an ecosystem operator should have a demonstrated capacity to assist in the incubation of distributed ledger utilities to avoid any monopolies forming; 6. The anticipated benefits of the development and use by the State of Oklahoma and its political subdivisions or agencies thereof of an integrated logistics, information, custodial, and payment tracking ecosystem, which uses hack-resistant distributed ledger technologies and a convertible virtual currency include: a. keeping customers' and any government citizens' or licensees' data secure and confidential, but available to ecosystem participants, stakeholders, regulators, and law enforcement communities on a transparent and need-to-know basis, as allowed or required by relevant laws or agreements between cooperating customers, persons, or parties, 13. "Distributed ledger technology asset offering agent" means a person who is appointed by a distributed ledger technology asset offering ecosystem operator and who is a licensed attorney with at least fifteen (15) years of law practice, in good standing with the Oklahoma Bar Association, and is appointed as counsel by the submission of entry of appearance documentation to the Oklahoma Department of Securities, the Office of Management and Enterprise Services, and the Oklahoma Tax Commission; 17. "Distributed ledger technology asset offering ecosystem operator" or "ecosystem operator" means a person or entity which employs at least one licensed Oklahoma fiduciary as its principal agent and which has general supervisory control over the subject ecosystem and provides to its customers smart contracts for electronic funds transfers, tax remittances, contract forms, escrow, custody, and goods and services tracking that become obligations for customers to pay the ecosystem operator in accordance with the terms of a designated and immutable smart contract; Prior to the acceptance by a state, county, or local governmental unit or agency of a vendor's bid or offer to contract, the prospective ecosystem or distributed ledger technology asset offering ecosystem operator shall show proof of having successfully participated in a state or federal convertible virtual currency and payment gateway demonstration and no-action processes. and 2. Demonstrate the proper procedural protocol publicly or privately in a test of the distributed ledger technology to the satisfaction of the state or federal securities regulators' compliance review processes. D. Preferences should be given to ecosystem operator applicants which have obtained United States Treasury, United States Department of Agriculture, and government charters, or certification as community development entities or credit programs which have maintained such status for at least ten (10) years and which are headed by licensed Oklahoma fiduciaries. A distributed ledger technology asset offering ecosystem operator shall: 1. Conduct its business with honesty and integrity; 2. Communicate with all stakeholders in a fair, clear, and non-misleading manner; 3. Conduct its business with due skill, care, and diligence; 4. Identify and manage any conflict of interest that may arise; 5. Have effective arrangements in place for the protection of stakeholders' and customers' funds; 6. Have effective administration arrangements; 7. Maintain all of its systems and security access protocols to appropriate international standards; and 8. When an ecosystem operator maintains a website and is required to make public disclosures,

make public any information or provide notice to the public on its website as required by law.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes. The storage of value on a digital wallet is not dependent upon the Internet and can be transferred to another customer's wallet using currently available technologies. To avoid double spending, INTR's Trak\$ can be transferred in this way using a QR code, bar code, RFID or NFC capability. The transferred value could be held in the wallet and redeemed for cash or deposited into a commercial bank account at the leisure of the customer. Then at such time as Internet services are resumed. The redemption or further transfer can occur, or any other required regulatory reporting can be accomplished.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes. Use Case- Bank handling letters of credit(LOC) Bank wants to offer DLT services to a wider range of clients including startups Currently constrained by costs & the time to execute DLT provides common ledger for letters of credit Allows bank and counter-parties to have the same validated record of transaction and fulfillment But if dispute arises, then there is recourse based upon relevant choice of law or by agreement Increase speed of execution (less than 1 day) Vastly reduced cost Dispute resolution and reversible transactions Licensed and Bonded Escrow Agents and Fiduciaries Oversee Compliance Use Case - Corporate Debt Bond Bank Holding a Corporate Debt Would Like to What? Pay vendors quickly for transactions validated by the client Allow the corporate client to see the payment is made Provide government with oversight of the process Reverse Transaction Based Upon Fraud or Mistake How? Distributed Ledger Technology provides a common ledger for recording the corporate debt/bond, Available to bank, corporate client, vendors and government INTR provides mechanisms for consensual settlement and dispute resolution Benefits? Speeds up vendor payments bigger net discounts Eliminates risk and accelerates decision making Owning bank can spread the cost across each market Transaction reversibility and Travel Rule adherence Fiduciaries ensure contractual and regulatory expectations Relevant provision from OK HB 3279 (DLTAO ACT): I. To form a smart contract or to obtain any services from the ecosystem, customers in a supply chain must agree to terms and fees for using the smart contract software, which may be established by the participating state agency, political subdivision, or tribal entity and the ecosystem operator who provides various services in exchange for the customer paying the fees to the ecosystem operator, as set forth in a smart contract agreement for services rendered as determined between the parties or by operation of the participating government agency, tribal entity, or political subdivision. J. Customers may purchase digital contracts and the negotiation of the charged fee in another digital contract, which is the smart contract, escrow, and accounting tool that determines the income going to the ecosystem operator for its services and that defines the ecosystem operator-to-customer and any controlling law or regulation affecting or specifying contractual relationships. K. The digital contract or smart contract shall determine how the ecosystem operator compensates the customer and how the customer compensates the ecosystem operator for goods and services. The contents of a digital contract may be determined by reference to existing terms administered by the ecosystem operator as an agent of a participating state agency, tribe, or political subdivision, but any participation by a tribal entity must be voluntary and as part of a memorandum of understanding or other appropriate agreement as provided by this act or by federal, state, or tribal law. A digital contract and payment to the customer by the ecosystem operator may include, but is not limited to, customer efforts as measured by volume of transfers or conversions, payment for the customer filling out a survey, or a referral fee for additional customers brought in by a customer. Services the ecosystem operator may provide to customers for which the operator is compensated may include such matters as identification, transfers, conversions, agreements, escrow, consent, due diligence, custody, taxation, or other matters. L. The ecosystem operator shall extract fees pursuant to the controlling law, regulation, agency rule, or digital contract account's defined terms, debited from the business's or customer's bank account as payment for the ecosystem operator's services. The defined terms for those services shall be found in the digital contract accounts or the relevant law or regulation affecting the specific agency, political subdivision, or tribal entity. M. The ecosystem operator's debits and credits shall be entered onto the immutable ledger in the form of a customer credit or debit to their digital wallets or corresponding bank accounts using automated clearinghouse services and application program interface. N. Compensation shall be paid to or by the ecosystem operator in United States dollars. Any fees the ecosystem operator charges for transfers, conversions, escrows, tax remittances, or other services performed in assisting in the execution of customers' transactions, or digital contracts entered between customers, shall be based upon a negotiated fee schedule, which shall be calculated, accounted for, tracked, and collected from any transaction between the customers, and a deduction shall be debited from the customers' accounts pursuant to an

agreement as memorialized in the smart contract account. Such fees charged may differ depending on matters such as the type of transaction..."

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

An effective CBDC will be interoperable to securely and efficiently interconnect diverse distributed ledgers. Interoperability between closed and permissioned digital silos becomes of paramount importance for guaranteeing a universal, unified, and non-segregated realm for distributed ledgers and multiple interoperable ledgers. An interledger solution is one that allows the interconnection of multiple ledgers, with flexibility for supporting innovation. Interledger approaches include 1) atomic cross-chain transactions, 2) transactions across a network of payment channels, 3) the W3C Interledger Protocol (ILP), 4) bridging, 5) sidechains, and 6) ledger-of-ledgers. All nodes have some level of access to the ledger. Trust is based on explicit factors in the system (e.g., transactions happening between the peers, behavior observed in the network), or on other implicit elements, such as business relationships between peers or any other criteria relating to the underlying application supported by distributed ledgers. All nodes agree to a protocol that determines the "true state" of the ledger at any point in time. The application of this protocol is sometimes called "achieving consensus." Unlike Ripple/XRP, Bitcoin, or Nxt, which are anonymous, and are inflexible unless forking, have no asset backing, do not protect their users, and are completely without recourse: the optimal ecosystem uses escrows as digital contracts and has central authorities who are licensed and bonded professionals and fiduciaries. Fiduciaries can intermediate to resolve disputes based on the Rule of Law and can reverse transactions if there are unlawful or mistaken actions taken by permissioned customers. The bridging approaches consider a consensus mechanism, such as Proof-of-Stake, Delegated Proof-of-Stake, or Proof-of-Authority among the bridge nodes used. The current, optimal interoperable capability involves Proof of Trust and can include paying fees to these bridging nodes for the interconnection services that they provide. Our pilot project in Oklahoma engages counties, schools, businesses, churches and individuals to cooperate as regulated nodes. [https://www2.aueb.gr/users/vsiris/publications/p30\\_interledger\\_approaches.pdf](https://www2.aueb.gr/users/vsiris/publications/p30_interledger_approaches.pdf) One DLT project INTR modeled on that received a no action reaction from the SEC is, Pocketful-of-Quarters. The developer sought to bridge the gaming and blockchain worlds by creating digital tokens that can be used interoperably on a virtual platform. The cross-platform currency also offered greater flexibility to developers over how they build, distribute, monetize and cross-market games, ultimately empowering them to create rich, new multiplayer experiences without losing creative and economic control to publishers. This gaming interoperability design can be easily repurposed to be used to interconnect disparate and siloed ecosystems or platforms with a CBDC. <https://www.prnewswire.com/news-releases/pocketful-of-quarters-officially-launches-with-first-and-only-compliant-and-interoperable-video-game-currency-for-the-metaverse-301485928.html> <https://www.sec.gov/divisions/corpfin/cf-noaction/2019/pocketful-of-quarters-inc-072519-2a1-incorrecting.pdf> "(T)here will be a correlation between the purchase price of Quarters and the market price of accessing and interacting with Participating Games; and PoQ will market and sell Quarters to gamers solely for consumptive use as a means of accessing and interacting with Participating Games" .<https://www.sec.gov/corpfin/pocketful-quarters-inc-072519-2a1> **INTEROPERABILITY**-The transfer can be facilitated by a third user, or fiduciary connector (INTR), maintaining accounts in both ledgers A and B. The idea is that the sender will transfer value to the connector in ledger A, and the connector will transfer the respective amount to the recipient in ledger B. Transferring and/or trading (or exchanging) value between chains. With transfer, value is portable, i.e., it moves from one ledger to another. This is achieved by having the "original" value (tokens) in the first ledger frozen or locked (or destroyed) and the "new" value (tokens) in the other ledger unfrozen or unlocked (or created). With trade (or exchange), value (tokens) on different ledgers are exchanged simultaneously, i.e., the transactions that move value (tokens) from one account to another on the same ledger occur in an atomic manner. Unlike the transfer of value, the exchange of value is dependent on the exchange rate of the tokens being traded. Transferring information or generic messages between chains, in a way that the information or messages on different chains are cryptographically linked. This is particularly useful in Internet of Things (IoT) applications to immutably record information on multiple ledgers in a manner that satisfies some dependency conditions and can allow correlation of custody, payment, service, information, and product transfer events.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Existential problems of climate catastrophe and economic collapse caused by technological innovations should be central in affecting design and policy choices related to any CBDC.

Our existential future is likely dependent upon financial and technological innovations to reduce atmospheric pollution that should be undertaken now. Over 11,000 scientists and numerous global assemblies warn that planet Earth is facing a climate emergency without enough being done. An immense increase of scale in endeavors to conserve our biosphere is needed to avoid untold suffering due to the climate crisis. Climate change threats are a national and a global security emergency analogous to a world war. Melting the ice caps may prove to be the greatest existential threat in the history of human civilization, which should make all other lesser concerns secondary. But the burden of reversing CO<sub>2</sub> buildup is falling on the nations disproportionately. If it will protect the planet's largest rainforest, Brazil wants to be paid upfront, but the United States wants to see results first before it advances funds. The United States and Brazil differ on how to finance. The Brazilian government has presented a new official goal for fighting deforestation in the Amazon -- a first for the administration of President Jair Bolsonaro. But critics say it's hardly enough, yet for reversing the accelerating destruction of the Amazon rainforest, finding the needed money might be the best bet for solving the climate-driven and anthropogenic extinction problems. President Biden has mobilized his entire administration to take on the challenges from every angle in a strategic, integrated way. Slowing climate change will require a comprehensive and coordinated "all hands on deck" approach. All Hands on Deck- The Creation of the Bank of England, a Financial Technology and Organizational Precedent for Dealing with Existential Crisis . England's crushing 17th Century defeat by France, the dominant naval power, became the catalyst for England rebuilding itself into a global power. However, the ability to construct this fleet was hampered both by a lack of available public funds and the low credit of the English government in London. To induce subscription to its bond program , the Bank of England was incorporated. The assets that England needed to rebuild its navy, so as to defend itself from France were there all along. It took the right law, organization, and a new financial technology, capable of attracting the needed capital, in order to have the needed funds pour into the coffers of the Bank of England . On 5-8-2022, the global cryptocurrency market cap was \$1.57 Trillion. Without intrinsic value or backing from defined assets, the investor network which upholds cryptocurrencies' value could divest. The value could all go away tomorrow, without even a bankrupt asset to be divided to show for it. But what if this 1.57T market cap could be repurposed using a new species of final technologies and organization and invested to save the rainforests? With a coordinated marketing campaign and a regulatory effort, funds derived from digital assets could be used for purchasing the rain forests from Brazil in order to help deal with global climate change. A Malthusian analysis concerns itself mostly with variables of food and geography. Published studies identify atmospheric pollution as the primary reason for an impending collapse and implicitly indicates more carbon sequestration and a negative carbon footprint as the cures. Recall that rationing and engaging the populace in an all-out defensive effort are the techniques of total war. President Biden is correct that an all hands approach is needed to combat and reverse CO<sub>2</sub> pollution. Ration cards in the WWI and WWII were a crude example of a track and trace management of the supply chain, implemented to ensure that the maximum effort was expended on the war effort. A platform using DLT and AI with incentives and disincentives, and one that protects legal and civil rights, could be deployed, one that can be quickly activated as the policy makers and population obtain the resolve to intervene in order to reverse what seems an inevitable environmental collapse. At the very least a rationing approach is an insurance policy to de-risk and reduce the likelihood of such an impending collapse.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

A STATE REGULATED DISTRIBUTED LEDGER TECHNOLOGY MANDATE (Oklahoma Distributed Ledger Technology Asset Offering "DLTAO" ) Fiduciaries and Trusts- Contrary to the design of the thousands of "trustless" crypto projects, in a Proof of Trust (PoT) system peers can express opinions about each other and declare trust links within the system. The distributed ledger is the system of redundant recordings or validator nodes for an individual, institution, business or government entity, i.e. records asset and information transfer between participants. The ideal ecosystem design does not run with a Proof-of-work (PoW) system like Bitcoin or a Proof-of-stake (PoS) system like Nxt. Instead, transactions rely on a consensus protocol design in order to validate account balances and transactions on the system. The consensus design works to improve the integrity of the system by preventing double-spending. Trusted community institutions run the validator nodes. Trak\$- A programmable digital dollar and a smart contract ecosystem combining identity, consent and reversibility (Self>Trak\$, Smar>Trak\$ and Hoop\$). Trak\$>ATM LLC, is an INTR subsidiary, which will supply physical kiosks for digital asset processing, payment, and tracking; a public-private owned, cooperative utility providing electronic fund/info transfer, tax remittances, payment, and tracking for the unbanked. INTR has designed and tested multiple minimum viable products in the SEC Fin Hub sandbox. INTR was well on its way in

April 2022, to having a state law passed which would help clarify for the Oklahoma, federal and tribal regulators a system for government's using the managerial services and software of vendors supplying digital ledger technologies assets offering services, or as a fiduciary and agent of the state taxation authority to collect taxes.

[https://tulsaworld.com/news/state-and-regional/govt-and-politics/oklahoma-house-looks-to-cryptocurrency-technology-to-address-medical-marijuana-issues/article\\_4215457a-a483-11ec-8768-b3141dd2772b.html](https://tulsaworld.com/news/state-and-regional/govt-and-politics/oklahoma-house-looks-to-cryptocurrency-technology-to-address-medical-marijuana-issues/article_4215457a-a483-11ec-8768-b3141dd2772b.html) Oklahoma House Bill 3279, the Oklahoma Digital Ledger

Technology Asset (DLTAO) Act passed overwhelmingly in the House with a 75 to 12 bipartisan vote. <http://www.oklegislature.gov/BillInfo.aspx?Bill=hb3279&Session=2200>

Relevant provision from OK HB 3279 (DLTAO ACT):O. Tax remittances, withholding, reporting, or payments shall be determined by reference to the smart contract, and the ecosystem operator shall collect the same as an agent on behalf of individuals, businesses, government regulators, and taxing authorities. Regulatory Compliance as Key Performance Indicators 2001- INTR granted federal charter intertribal agency rights. 2002- INTR certified as Community Development Entity by US Treasury. 2016- INTR launched Trak\$ ATM as a pilot project. 2018- INTR General Counsel's Office participated in drafting legislation for the state of Oklahoma Legislature's Joint Committee on Medical Marijuana. 2019- March- Ok Tax Comm authorized INTR to collect cannabis taxes. April 2019- SEC releases "Turnkey Jet" No Action INTR-OPT filed an application for No Action with OK Dept. of Securities (ODS). Aug 2019- ODS referred INTR to SEC, then entered Corp Fin/Fin Hub No Action sandbox. Dec 2021- INTR presented an informal distributed ledger tech (DLT) demo to Jonathan Ingram, author of SEC Turnkey Jet no action position. Feb 2022- INTR presented a formal DLT demo to SEC director Valerie Szczerpanik. Mar 2022- INTR General Counsel drafted Oklahoma Distributed Ledger Technology Assets Offering (DLTAO) Act which passed with overwhelming bipartisan support (75 to 12). Apr 2022- HB 3279 assigned to Senate Commerce Committee, Chair accepted for hearing and vote. INTR's government affairs team withdrew HB 3279 from contention after the banking and cannabis lobby posed questions. The bill was withdrawn from the Senate Commerce Committee where it had been assigned.

<https://www.news9.com/story/62311237b446e00188a70be7/oklahoma-lawmakers-look-to-create-nations-first-marijuana-banking-system> The goal now is to involve more the banking, technology, and legal communities and integrate the lessons learned and reintroduce the modified DLTAO Act in the next session.

<https://www.cannabisbusinesstimes.com/article/does-oklahoma-have-answer-to-cannabis-banking/> INTR was modeled after the Federal Reserve and to be a part of its system. INTR has a duty to conform to the Federal Reserve's policies. Within the intertribal statute controlling INTR it states: "Upon determination by the Indigenous Nations Tribal Reserve Board that such action will be useful for the purposes for which it is established...it may... become a member of the Federal Reserve System."

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*Name or Organization*

Steven Hack

*Industry*

Individual

*Country*

United States of America

*State*

Texas

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Don't do it !!!!!

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Don't do it !!!!!

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Don't do it !!!!!

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Don't do it !!!!!

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Don't do it !!!!!

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Don't do it !!!!!

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Don't do it !!!!!

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Don't do it !!!!!

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Don't do it !!!!!

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Don't do it !!!!!

11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Don't do it !!!!!

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Don't do it !!!!!

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Don't do it !!!!!

14. *Should a CBDC be legal tender?*

Don't do it !!!!!

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

Don't do it !!!!!

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Don't do it !!!!!

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Don't do it !!!!!

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Don't do it !!!!!

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Don't do it !!!!!

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Don't do it !!!!!

21. *How might future technological innovations affect design and policy choices related to CBDC?*

Don't do it !!!!!

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Don't do it !!!!!

---

*Name or Organization*

Edward W Twohig

*Industry*

Individual

*Country*

United States of America

*State*

Massachusetts

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Protection of the "commons"

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Of all the "COMMONS" of a Government or society, the most critical to the other commons and functions "of the people" "by the people" "for the people" is money and the monetary system. It is the duty of the Government to create money as a "common" of all the people. All forms of money, coin, paper or digital, should be created by Government, or its central bank, equally for all citizens. The inequality in the distribution of money would be alleviated by the payment of value to the Government for the money used in the private sector. The circulation of money within the economy should be through financial intermediaries in the private sector. Money provided to the private sector for payment of Government expenditures are equally on behalf of the people in common. Money provided as the medium of exchange within the private sector is not, and can not be, to the equal benefit of the people. The use of money as a medium of economic value and a measure of wealth over time accrues unequally in the private sector. Therefore the value over time, as "interest" should be paid, by the private sector, to the Government so as to distribute that value equally to the 'commons.' All money should be provided by the central bank ( government ) as deposits to the private sector through financial institutions licensed to accept deposits. Deposits from individuals or the Government should bear an equal rate of interest. The Government, through its central bank, in the interests of economic well being, would maintain control of volume and purpose of money in circulation. The expertise and independence of a central bank would ensure provision of money to productive sectors, both national and regional. The amount of money in circulation would be controlled by Government expenditure or advances to the private sector and by withdrawal from the private sector by taxation or sale and repurchase of Government bonds. Efficient money circulation and payments in the private sector by banks or other intermediaries would be regulated by the Government. The intermediaries would pay a value for the use of the money to the people through interest on advances by the central bank. The value paid for the use of the money by a borrower would include that base value plus risk, overhead and profit. A single source of central bank creation of coin, paper or digital money would ease control of the volume of money in circulation. The sale and redemption of Government securities would enable timely adjustment of the money supply. Payment for value for the use of money from the private sector would reduce taxation. The taxation base might then be moved from production to consumption and more socially useful bases.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

By eliminating the fallacy that the availability of money controls these goals. Government can create and supply any quantity of money and withdraws any quantity by taxation or by the sale of bonds.

5. *How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

By eliminating debt and the profit motive from the creation of money. During downturns when money circulation is beneficial the tendency to repay debt removes money from circulation

6. *Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

By reducing financial speculation

7. *What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

8. *If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Absolutely

9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

By establishing an international trading currency as was an option at the Bretton Woods conference.

10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

All countries have been suffering from the finalisation and neoliberal policies of the 1970's. They should all secure money creation for the people and an international currency for trade.

11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Forget "complete anonymity". The illicit activity that has caused the current concentration of wealth and economic problems have resulted from too much anonymity.

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

14. *Should a CBDC be legal tender?*

Of course.

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

The use of CBDC should bear interest. CBDC money created in the public sector and put on deposit in the private sector should bear the same rate of interest that reflects a value for use.

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

No. If interest is charged for the money that should be sufficient.

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Firms with at least 50% equity should be eligible to have CBDC on deposit. The intermediaries should be regulated so as to support economic goals. Mortgage loan and small business serving entities should be established locally to encourage locally deposits and mortgages. All intermediaries should have speculative practices regulated.

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

All intermediaries should provide the means for ease of use of all central bank or Government created money, whether coin, paper or digital.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

*Industry*

Individual

*Country*

United States of America

*State*

Illinois

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The fact that central banks will have direct control of our currency, and there would be ZERO privacy or rights to our personal \$

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

yeah - get rid of the effort and dissolve the federal reserve, as you are all completely un-elected and incompetent and yet at the same time have the most power in the world.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Negative since you would completely outlaw all other forms of fiat currency

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*
14. *Should a CBDC be legal tender?*
15. *Should a CBDC pay interest? If so, why and how? If not, why not?*
16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*
17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*
18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*
19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*
20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*
21. *How might future technological innovations affect design and policy choices related to CBDC?*
22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

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*Industry*

Other: Law

*Country*

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*State*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Primary risk is making it a surveillance tool which in a violation of the letter and spirit of the constitution. Individuals who earn should have the right to spend their savings as they please without fear that they are being monitored. Moreover, government officials have historically fallen victim to their humanity and imperfections by using any tool they can lever to achieve their political aims. The sanctions regime being practiced on other countries and their citizens is an example: without any court order or due process, government officials should have no ability to seize or restrict how individuals spend their savings and earnings. A CBDC is a gateway tool to enact a social credit system, which is antithetical to constitutional values.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Allow private parties to compete in the market for business of a stable coin, as is being done with @circle's USDC starting to win over the original stable coin Tether. The market will decide which is the best stable coin, and competition will spur continual innovation.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

No. Anyone can access private stable coins, which are 100% inclusive. To the extent they are not, competitors will rush in and offer more inclusive products.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Only as an excuse for the power grab. The Federal Reserve doesn't require a stable coin to achieve those mandates and to the extent they are not being achieved (like now), a CBDC would not help.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

It would disintermediate banks, if CBDCs were enacted and Fed policy was implemented through direct payments to citizens. That's not the function envisioned for the fed by its creators.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Yes. By disrupting the innovation of allowing private stable coins to compete and develop features valued by the marketplace.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

None worth considering, given the potential for mischief, privacy intrusion, and denial of liberty to individuals.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

No. The public's access to central bank money comes indirectly through banks, interest rate setting and direct asset purchases, as well as Fed speaker sentiment. Cash will be preserved through the private sector via stable coins and actual cash.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

The Lightning and Liquid networks over Bitcoin (faster, cheaper, greater inclusion) is the most obvious and best choice, as well as stable coins.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The US should be the freedom leader. China will be the CBDC leader and continue to provide an exemplar of how to invade privacy and curtail freedom. The US dollar can thrive as the indirect monetary unit behind private stable coins, provided the US continues to allow the lion's share of the innovation, ownership and businesses built on the strong foundation of Bitcoin and stable coins.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

The above are the primary risks. Additional risks are that congress or a future president turns a less bad CBDC into a worse anti-liberty tool in the name of addressing tax evasion, money laundering or other excuses.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

While I expect claims to be made about how privacy could be programmed in, the reality is government operates through human beings who then get access (example IRS scandal during Obama administration). Practically impossible.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Not sure. But I would never get to this question, which is implementation.

*14. Should a CBDC be legal tender?*

It shouldn't exist. It shouldn't crowd out private stable coins.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Again, this seems like a trojan horse for a bad idea. Besides, who pays the interest? Taxpayers? Why?

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

It took 16 questions before the author of the questionnaire started contemplating limiting citizen's rights.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

What's the point of entangling intermediaries? The sole favorable point for a CBDC would be by-passing banks, costs and efficiency.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Not sure.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

No. I prefer private stable coins and no governmental tracking.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Private stable coins and \$BTC do this.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

The government doesn't need to be in the business competing against a competitive private sector.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Not that I desire to contemplate.

---

*Name or Organization*

*Industry*

Individual

*Country*

United States of America

*State*

Michigan

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

i think that the federal reserve should contintue on the path they are on it seems to be working well for the us at this time.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

i dont have any coments at this time

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

not com ment at this time

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

nothing at this time.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

nothing at this time

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

no coment

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

no comment

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

no comment

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

no comment

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

no comment

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

no comment

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

no comment

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

no comment

*14. Should a CBDC be legal tender?*

no comment

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

no comment

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

no comment

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

no comment

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

no comment

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

no comment

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

no comment

*21. How might future technological innovations affect design and policy choices related to CBDC?*

no comment

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

no comment

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*Name or Organization*

Gary Krause

*Industry*

Individual

*Country*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

CBDC is not Bitcoin so the risk of unsound money continues.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes. Bitcoin.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

yes. CBDC will enable censorship of money which is net negative for the world. Bitcoin is accessible world-wide.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

It will be totally in control of the Fed so it will allow you to continue to print and debase our currency. Please research the history of price controls (aka "price stability") and review the outcomes.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

It would result in the same financial instability we experience with the USD.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Yes. CBDC allows censorship of financial institutions and individuals in the financial sector. This is in direct opposition to the permissionless/borderless/censorship resistant property of Bitcoin.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Not adopting CBDC is the best mitigation.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

yes, but only with Bitcoin since it is a neutral global currency with protections far superior to anything the Fed or the US Govt. can create.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Bitcoin. It's already happening and can't be stopped. Lightning Network.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

It shouldn't. The US should reject any CBDCs and lead the way with bitcoin adoption.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Yes. Adopt Bitcoin.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

See the Fourth Amendment of the Constitution.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

It could be abandoned in place for the securest single purpose computing network in the history of man. Bitcoin.

*14. Should a CBDC be legal tender?*

No. Bitcoin should.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

No. Because CBDC shouldn't exist.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

No. Because CBDC shouldn't exist.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

No. Because CBDC shouldn't exist.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

No. Because CBDC shouldn't exist.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

No. Because CBDC shouldn't exist.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

No. Because CBDC shouldn't exist.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

They shouldn't impact CBDC because CBDC shouldn't exist.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Yes. Consider scrapping the CBDC in favor of adopting Bitcoin as a standard. It is far superior and already established.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

A potential benefit not mentioned in this paper is the degree of competition the Federal Reserve could introduce into the financial services market through the introduction of a CBDC. When the internet was commercialized more than forty years ago, there were hundreds of companies innovating and attempting to establish themselves to serve consumers. Over the years, we see a dramatic reduction in choices and concentration of market power among just a handful of companies: Microsoft vanquished companies like Netscape, WordPerfect, Lotus, etc. and effectively became a monopoly in many segments of the software industry. We are also, currently, witnessing this in the “internet search”, as well as the oligopolies of mobile operating systems, cloud service providers, etc. The extraordinary concentrations of market power by some companies is not always due to superior products and services; evidence shows that some of these companies abused their monopolies in one product to require buying an unfavorable one from the company - a practice known as “bundling”, while others simply violated anti-competitive laws. If one has been paying attention to business practices of financial institutions over the years, as well as press releases from the Consumer Financial Protection Bureau (CFPB), it is apparent that financial institutions are not exempt from anti-competitive or illegal practices to appease their shareholders. Through the introduction of a CBDC and a well-formed policy that supports regulated nonbank service providers, the Federal Reserve can preserve a competitive marketplace for the delivery of financial services. Forcing innovative software companies to partner with a regulated depository institution is a barrier to encouraging competition – especially when the software company might have better risk-mitigation technology than financial institutions. By defining policies and requirements by which service providers can enable retail transactions with CBDC in the regulated nonbank financial service industry (without the need to partner with a regulated depository institution), the Federal Reserve can bring many innovative and cost-effective solutions to the market. Secondly, the U.S. is witnessing inflation rates unseen in four decades. As the Federal Reserve starts using tools it possesses to reduce inflationary pressures, it must wait – sometimes for months – to see if its deterrents are having any effect. Retail CBDC accounts that pay interest pegged to the rate of inflation, will be a powerful addition to the Federal Reserve’s arsenal with the ability to provide minute-by-minute feedback on consumers’ reactions. A risk under-emphasized by this paper is that of the Federal Reserve not introducing a CBDC in light of countries like China having introduced one already, and more than 100 others – including US allies – exploring the introduction of a CBDC. The Russian-Ukrainian war has highlighted how sanctions imposed by western countries are causing a rise in transactions with “crypto currencies”, with news reports indicating that some countries are negotiating the purchase of oil and commodities denominated in yuan and rubles. To the extent countries like China and others make their CBDCs easier to transact with, notwithstanding the US dollar’s strengths, the perception of the US Dollar appearing “stodgy” could rob it of its unique position in the world. While having a US CBDC does not alleviate issues created by sanctions, not having one encourages the use of alternate digital currencies for financing transactions. A US CBDC that makes transacting in digital currencies easier will continue to keep the dollar preeminent in international transactions.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Innovative technology – the internet, cheaper and faster computing devices, mobile

communications, open-source software – created the impetus for digital transactions that enabled faster, cheaper and better access to financial services. However, some entrenched players continue to hold outsize market-share in some segments, while frequent Consumer Financial Protection Bureau (CFPB) press releases highlight actions of some of these companies that cause consumer harm. Signs of intense lobbying to prevent the Federal Reserve from introducing a retail CBDC only serve to preserve such entrenched interests.

Some parts of the world are using legislation to break down walls entrenched interests have built around financial records that can aid consumers in getting better products and services from the market. The Second Payment Services Directive (PSD2) in the European Union and Consumer Data Rights (CDR) in Australia, for example are forcing banks to allow software companies who have the consent of consumers, to download financial data from the banks' databases and compete with the banks to provide better products and services. While the U.S. has no such "open banking" regulation, some software companies are eagerly awaiting the CFPB's proposed rule for "Consumer Access to Financial Records", which hopes to open up the walls built by U.S. financial institutions. However, this is not enough. Technology is enabling the creation of digital currency all over the world. While public key cryptography that enables transaction authenticity, confidentiality and integrity was introduced more than three decades ago, and the programmability of software data structures such as linked lists were known for more than sixty years, an innovative paper on blockchain combined elements of both technologies, while adding other capabilities, to solve certain technical problems in a unique manner. Blockchain gave rise to an explosion of investment – and speculation – around its capability. While the philosophical debate around blockchain is likely to continue for years to come, knowledgeable software companies can take advantage of this concept, combine it with traditional – and proven – data security capability to deliver innovative financial services to consumers at lower cost. In a world where a coffee bean farmer in East Africa can communicate instantly with almost any wholesale or retail buyer in the world over the internet, it is archaic to force money to move through systems and infrastructure built for a different age. As responsive as the private sector is with the availability of products and services to serve such consumer needs in the digital age, the last few decades have provided the world sufficient evidence that the private sector can make decisions endangering the world politically, economically and financially when driven purely by the profit motive. As well as existing products, services and financial technology have served the world in the past, anything short of a full-fledged retail CBDC from the Federal Reserve will serve to only handicap the CBDC's potential and to serve entrenched, and potentially, nefarious interests. The future demands better.

### *3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Indeed, it could. The net effect would be positive if the following conditions were met: 1. CBDC must be legal tender; 2. USG agencies at all levels must enable support for CBDC to be received from, and disbursed to consumers where such transactions are appropriate; 3. The retail ecosystem should be encouraged to transact in CBDC through independent, royalty-free standards rather than technology-vendor driven associations. Mobile phone manufacturers should be given incentives to include such standards into their devices to enable rapid adoption. To the extent it is feasible, the Federal Reserve should coordinate the creation and deployment of such vendor-independent, royalty-free standards with other like-minded nations and the Bank of International Settlements (BIS) so CBDCs are not "balkanized"; 4. The Federal Reserve should allow for the creation of regulated, non-depository service companies whose primary purpose is to enable transacting in CBDC – functioning much like payment processors in the credit-card industry - facilitating transactions without holding currency. Companies focusing on financial inclusion must be fast-tracked towards participating into this ecosystem as long as they meet security and privacy control requirements; 5. An identity policy and scheme must be defined and implemented to enable undocumented residents of the US to participate in the CBDC ecosystem. Even if they are not legally authorized to reside/work in the US, they are here. With an appropriate balance of policy, security, privacy and anti-money laundering (AML) controls, it is feasible to craft solutions that permit them to transact with CBDC without exclusionary controls – or keeping them out of the digital age and subjecting them to usurious money-lenders in the analog ecosystem. If any of these conditions cannot be satisfied, desired financial inclusion goals will remain unmet.

### *4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Maximum employment and price-stability is a function of many variables not exclusively under the control of the Federal Reserve. Interest rates and money supply are important determinants – but more depends on qualitative factors beyond the control of the Federal Reserve, such as: • Access to education and training; • A "level playing field" that ensure

equal access to opportunity in many sectors; • A reasonable safety-net that permits new entrepreneurs to take moderate risks with starting new businesses; • USG agencies truly supporting small businesses rather than paying lip-service and buying from giant suppliers through small business resellers that add little value to the transaction. Before the internet was invented, one could only envision the types of applications, tools and services that connectivity might foster. We have since learned that almost anything is possible once such an ecosystem is available and when creative minds develop new applications, tools and services. A US retail CBDC is in the same place as the Advanced Research Projects Agency (ARPA) experiment with the intergalactic computer network was half a century ago: lots of promise and trepidation, but with limited ability to visualize the potential for positive change. Much as ARPA moved ahead to build the internet, the Federal Reserve should move ahead to create a retail CBDC. With appropriate privacy controls, macro-data generated from applications, tools and services that support the CBDC will provide the Federal Reserve with new tools that might better effect monetary policy. Nothing ventured, nothing gained.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Any new form of money with the backing of the Federal Reserve is bound to create waves – not just in the US, but around the world. Much as our ancestors evolved from using shells and beads, we must plan to evolve from paper and coin in the digital age. While many transactions appear to be digital in the current environment, much of the technology and infrastructure that underpins today's digital environment was created many decades ago. It does not have the end-to-end authenticity, confidentiality and integrity controls that are necessary to support a trustworthy store of value or a means of exchange. A truly trustworthy digital currency must be designed from the ground-up to serve the rest of the 21st century and beyond. This is where a CBDC can help. It represents an opportunity to "reboot" digital payments to learn from our mistakes of the last few decades and create something better to serve humankind for the future. Notwithstanding the friction that exists within banking regulations and schemes across the world, the U.S. Dollar enjoys extraordinary trust everywhere. The world has taken note of the extraordinary wealth the internet has created for the U.S. While the internet may not have been primarily responsible for these economic benefits, the Gross Domestic Product (GDP) of the U.S. alone went from less than \$4T to more than \$20T in the last 40 years – the years the internet was commercialized and made available to the world. Could the CBDC create such wealth for adopters around the world? It is too early to tell, but a few self-sufficient countries are not waiting to find out – they are plunging into it for better or for worse. The vast majority, however, are waiting for the U.S. to make its move. If any nation has the creativity, resources and regulatory framework to make a success of it, in the eyes of many nations, the U.S. does. Given the ubiquity of the internet, mobile devices, availability of capable software technology, the U.S. has a once in a generational opportunity to create a framework that can bring more financial stability to the world – not just for the U.S. alone: • In the hope that nations that "hitch their wagon" to the U.S. CBDC will see similar growth in GDP as the U.S. did with the internet, some countries will choose to align their financial regulatory frameworks more closely with the U.S. financial system; • As a global, inter-operable CBDC ecosystem grows, authoritarian countries will find themselves increasingly isolated from the prosperity that will accrue to a rules-based ecosystem. While China will have the heft to build a CBDC ecosystem in conjunctions with other authoritarian nations, kleptocrats and despotic leaders, nonetheless, crave the imprimatur of the U.S. Dollar with their ill-gotten wealth; such individuals and nations will find themselves with fewer options in a financial ecosystem that is significantly tightened to support a U.S. CBDC; • International trade will become easier and less expensive as more companies and individuals transact with the U.S. CBDC directly; • Innovative software companies from all over the world will be encouraged to create products and services that interact with U.S. CBDC, thereby bringing innovation faster and cheaper to the world, rather than in regional pockets. Might a U.S. CBDC create sufficient prosperity on earth that some of the problems we see currently evaporate? It is probable; however a half-hearted attempt that preserves inefficiencies of the current financial system will only exacerbate the divide from the "haves" and the "have nots". Only a "rebooted" digital payments infrastructure that builds authenticity, confidentiality, integrity and agility into its foundations will be able to deliver benefits the new ecosystem promises to deliver. CBDC represents that opportunity.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

It is important to acknowledge that failures within private money ecosystems caused the 2007-2008 global recession. But for taxpayer bailouts, the US might have fared worse consequences than it did. While policies enacted since then will (hopefully) mitigate a similar recurrence, the ecosystem needs invigoration that can prepare us for the rigors of the 21st century. By offering a CBDC, the Federal Reserve can unleash a wave of innovation and

competition that benefits consumers all over the world: 1. The velocity of money will increase, leading to consequential economic benefits for all. While most consumers and businesses currently have the ability to move money electronically, not only are the costs higher than they need be, but the more economically disadvantaged participants in the economy bear higher costs for those financial transactions. With a ubiquitous CBDC that can be transacted at lower costs, more people will be encouraged to use it – replacing cash, checks and/or money orders – that will increase the number of transactions; 2. New financial services will be spawned that benefit more consumers at lower costs. Large companies that invest in creating systems to manage financial products and services are encumbered with legacy products that are, sometimes, unable to evolve rapidly to changing market conditions and needs. Smaller companies with innovative ideas and solutions are hindered by their inability to access consumer financial data and/or connect to the Federal Reserve (since they are not depository institutions); this prevents them from bringing their innovation to serve the financial market. With access to retail CBDC through a transparent framework, companies that meet the Federal Reserve's regulatory requirements will be able to enable to bring their innovation to market faster; 3. Global pandemics will cause milder economic disruptions to nations where CBDC exists. As rapidly as Congress passed legislation to distribute cash to individuals adversely affected by the recent pandemic's lockdown, the State of California alone lost more than \$10 billion through fraud as it attempted to distribute money to unemployed Californians through the Employment Development Department (EDD). The Internal Revenue Service (IRS) also reported nearly \$2 billion in fraud related activities in 2021 alone from the pandemic relief funds. With a CBDC designed to operate on stronger and more secure infrastructure and applications, it is possible to not only distribute relief funds rapidly to registered and authorized retail CBDC accounts, but it is also possible to eliminate such fraud with appropriate technical security controls. Undoubtedly, the introduction of CBDC will cause short-term disruptions to some incumbents since their applications are unlikely to have the most advanced security capability (authenticity, confidentiality and integrity) that eliminates/minimizes fraud. However, as ecosystems adapts to CBDC, with applications that have the appropriate security and privacy controls, we will see vast improvements in the financial sector. CBDC offers a singular advantage that no stablecoin can offer – the full backing of USG, with a mandate to benefit all residents/citizens of the US. This alone may serve as a disincentive for private money speculation (who may presume that taxpayers can be counted on to bail them out because "banks are too big to fail"). With a retail CBDC backed by a Central Bank that will not fail, an alternative network for digital money will exist; as such, private money will bear the full risk of speculative investments without burdening taxpayers.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

It is our opinion that the goal of the Federal Reserve should be to focus on the benefits that residents/citizens of the USA will derive from the introduction of CBDC, without regard for the adverse impact of CBDC on the financial sector. While the Federal Reserve must certainly make sufficient information available to adopt CBDC (as it is doing so with the FedNow Service), it is impractical to expect that every company and financial institution will do so. Some companies may simply choose not to adopt CBDC for a variety of reasons, while "rent seeking" and unethical institutions are bound to lose with the introduction of the CBDC. They is simply unavoidable as technology evolves. For those who cannot adopt CBDC for lack of resources, the Federal Reserve must focus on enabling the bottom 80% of institutions within the financial sector should be provided open-source tools, lower costs, incentives and support to adapt to the requirements of CBDC.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Absolutely! We are witnessing a global phenomenon where consumers are seduced to eliminate the burden of carrying cash from their lives; but, this leaves them forever beholden to private companies for transactions. Given that private companies must primarily focus on shareholders rather than the general public, this can have disastrous consequences for society as cash eventually disappears from the economy. While electronic payment transactions are, indeed, more convenient for a majority of transactions, the Federal Reserve has an obligation to preserve the general public's ubiquitous access to a central bank electronic money so they may always have an alternative to private electronic payment services.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Since the Bank of International Settlements (BIS) is already committed to Nexus, an instant

cross-border payments infrastructure is a given. However, the goal of Nexus is to enable cross-border payment flows within existing payment infrastructures. While this will deliver cross-border payments within 60 seconds (if all goes well), it does not envision the possibility of new products and services that a U.S. CBDC might enable in an environment where multi-CBDC economies are available. Before the internet was invented and commercialized, the world had a communications system that was "instant": Morse code, Telex communications, etc. When the internet came to be, early products and services merely transplanted existing communication applications and schemes to the internet to make it faster and cheaper. However, the richness of what the internet enables today took decades of innovations. The same is true of CBDC. Not only must we introduce a retail U.S. CBDC, but we must also participate in efforts to foster multi-CBDC. We cannot imagine what will result two decades from today unless we unleash the creativity that it will engender.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Given that the introduction of CBDC by China is the one that matters, it is paramount that the USA introduce a CBDC expediently. What is at stake is not the payments ecosystem or the preeminent position of the U.S. Dollar, but the very soul of democracy. Based on events of the last two decades, it is evident that China will not transition to a democracy in the near future. However, its ability to surpass the USA as the world's largest economy is strengthened with the introduction of the Chinese CBDC (among other contributing factors). The moral, political and economic consequences of a bloc of authoritarian nations upstaging a bloc of democratic nations cannot be overstated. And, if the most powerful of authoritarian nations shows leadership in an important segment of the global economy, it has the potential to create the nexus for a new world order in which the U.S. may not play an influential role. By creating an inter-operable retail CBDC, based on a governance model supported by like-minded democratic nations, the United States will continue to offer the world an alternative. Given the current strength and position of the U.S. Dollar, it is imperative that the U.S. not be left behind in this race for ideology.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Much as the creators of the internet could not foresee all its benefits and drawbacks before its inception, it is impossible to foresee everything with the introduction of a U.S. CBDC. However, important lessons can be learned from the failures of some parts of the internet - the Federal Reserve should put in safeguards from the outset to prevent similar mishaps. Specifically: 1. Notwithstanding the Internet Engineering Task Force (IETF) establishing royalty-free standards for establishing the authenticity, confidentiality and integrity of messages at the application layer nearly three decades ago – Secure Multi-purpose Internet Mail Extensions (S/MIME) – the vast majority of the internet ignored these standards even as the capability became ubiquitous within electronic mail messaging systems two decades ago. The Federal Reserve must mandate the use of technical standards that guarantee similar security controls within CBDC transactions – from end-to-end within applications – not just at the network layer as it is performed currently; 2. The vast majority of attacks to applications systems and networks originate in the use of "shared secret" authentication schemes and protocols. Passwords, one-time passcodes (OTP), knowledge based authentication (KBA) are some examples of "shared secrets" which result in scalable attacks that compromise everybody when a single attack is successful. The IETF, once again, established royalty-free standards – X.509 Public Key Infrastructure Certificate – for the use of passwordless authentication based on public key cryptography, more than two decades ago. While deployed in some scale within government agencies, this capability is largely ignored in consumer facing applications even within banking and fintech sectors. This has resulted in more than 10,000 data-breaches with more than 11 billion sensitive data records compromised over this period. Newer protocols – Fast Identity Online (FIDO) – using public key cryptography have more recently become ubiquitous on all desktop/laptop and mobile platforms, and have been successfully demonstrated in multiple NIST National Cybersecurity Center of Excellence (NCCoE) projects as providing high-assurance authentication. Updated guidance from the Federal Financial Institutions Examination Council (FFIEC) in 2021, reference one such NIST NCCoE project – Multifactor Authenticator for e-Commerce - as an example of how to mitigate authentication risk for higher risk transactions with FIDO technology. The Federal Reserve must mandate the use passwordless authentication using public key cryptography for all CBDC transactions; this will provide assurances that the single largest cause of data breaches is eliminated from CBDC infrastructure; 3. It is fashionable these days to assume the "cloud" provides an answer to all of one's information technology needs. However, it is our opinion that the "cloud" poses an enormous risk to something as critical as the CBDC infrastructure. Not only have attackers shown that Uber, Capital One, Twitch and many other companies can be completely compromised in the cloud, but the Bank

of England's July 2021 Financial Stability Report identifies the cloud as presenting a risk to financial stability. The Governor of the Bank of England, Andrew Bailey, has gone on record that "secrecy" and "opacity" are prevalent in cloud deployments, and that cloud security is "of particular concern". While we believe that the cloud offers some capabilities that can be taken advantage of within information technology deployments, this must be done so with applications that have been designed from the ground-up to ensure sensitive data and transactions remain impervious to attacks in the cloud. The Federal Reserve must mandate that applications prove beyond reasonable doubt that sensitive data and transactions can never be compromised in a cloud.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

With the right balance of policy, procedures and technical controls, the Federal Reserve can balance the conflicting goals of consumer privacy with its objectives to prevent illicit financial activity. Specifically, the Federal Reserve can mandate that: 1. Participants are "on boarded" into the CBDC ecosystem only after specified "know your customer" (KYC) controls are satisfied; 2. Participant accounts (of the Sender/Payer) in the CBDC ledger are anonymized (through encryption and tokenization), while transactions involving those accounts remain publicly visible – particularly to the IRS and law-enforcement. Where details of specific transactions might leak the identity of participants, those details of transactions must also be anonymized; 3. Companies creating software facilitating CBDC transactions maintain a company-wide "transaction trail" of anonymized transactions that remains publicly visible; 4. Very small transactions – say, \$20 or less – of a certain frequency within a defined period, may remain completely anonymous (for the Payer and Payee) if the policy chooses to support higher levels of privacy in the transaction trail. It should be noted, however, even completely anonymous transactions might be traceable if the software facilitating such CBDC transactions adheres to KYC regulations with appropriate controls to prove compliance to such regulations; 5. Companies creating software facilitating CBDC transactions are required to implement end-to-end security within the application software without having to rely upon network and system controls to provide that security. It would not be amiss for the Federal Reserve to require such software to be independently tested and certified to meet specific control requirements before being permitted to participate in the CBDC ecosystem; 6. When transactions need to be made visible to law enforcement and/or other regulatory authorities, this must be done through digitally signed warrants that are placed within the software company's transaction trail whose transactions are audited. Where necessary and justified, select details of the warrants may be anonymized; however, such anonymized search warrants must be subject to due process as prescribed in the Freedom of Information Act (FOIA).

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

While monetary and transition risks cannot be discounted, it is crucial to recognize that CBDC – unlike all other forms of money that preceded it – completely depends on computer technology to maintain the confidence of the general public. As such, the importance the Federal Reserve must accord to cyber risks cannot be overstated. The technology industry has the distinction of being the only segment of the economy whose products and services are unregulated in the U.S. As a consequence, more than 10,000 publicly disclosed data-breaches have occurred in the US with more than 11 billion sensitive records disclosed. This is simply unacceptable! While the answer to question #11 provides examples of mandates the Federal Reserve may specify to mitigate risk, given the significance of the CBDC initiative, it must go further and ensure that CBDC security supersede all other factors – especially "user experience" (aka UX) factors – when establishing the CBDC. To this end, the Federal Reserve should review Atlantic Council's Strategy Paper on "A Nonstate Strategy for Saving Cyberspace" and adopt elements of the specified strategy where appropriate. Additionally, this author has published an opinion on forbes.com titled "Disruptive Defenses are the Key to Preventing Data Breaches"; while the tactical measures specified in the article might appear daunting on the surface, based on more than two decades of work in cyber risk mitigation, this author advocates technologists to incorporate the specified measures into their applications as a "standard operating procedure".

*14. Should a CBDC be legal tender?*

Without a doubt!

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Yes, it should. The U.S. is currently witnessing inflation rates unseen in four decades. Savers

– especially, retired ones – are most affected as inflation eats into the value of their cash holdings. If the Federal Reserve had a tool to guarantee that savers' cash holdings are not devalued during inflationary times, it will incentivize consumers to hold cash leading to a reduction in inflationary pressures in the market. While private financial institutions could, technically, offer interest rates that were equal to, or better than inflation rates, they generally do not because they have neither an incentive nor a mandate to do so unless compelled by competitive forces. CBDC accounts that pay interest is a natural solution to this problem. With Federal Reserve issued retail CBDC accounts, consumers can be paid interest on their CBDC holdings, pegged to the rate of inflation (adjusted at a frequency determined by Federal Reserve policy). As inflation rates move up or down, interest on CBDC can move commensurately. The higher the inflation rate, the greater the incentive for consumers to move their non-cash holdings to CBDC – thereby decreasing inflationary pressures in the market. This incentive will also work during recessionary periods should inflation rates become negative. Secondly, the Federal Reserve will have the ability to receive "real-time" feedback automatically as it sees its holdings of CBDC go up or down depending on inflation rates in the market – it will not have to wait for weeks or months to learn if its inflation fighting tactics are having any effect on markets. An approach for paying interest on CBDC is as follows: 1. Upon the creation of CBDC, the Federal Reserve creates a CBDC account within its ledger, similar to its Cash account; 2. It debits its Cash account by some chosen value – say 25% of its holdings – and credits its CBDC account with an equal amount of CBDC; 3. As consumers enroll for Retail CBDC (rCBDC) accounts and transfer their cash to their rCBDC account from external sources, consumers' rCBDC accounts are credited while their cash accounts are debited at external sources. Commensurately, Federal Reserve's Cash account will be credited with consumers' transfers while its CBDC account is debited; 4. When interest accrues within consumers' rCBDC accounts, the Federal Reserve's CBDC account is debited, crediting consumers' rCBDC accounts when paid; 5. As the Federal Reserve's CBDC account dwindles, it continues to debit its Cash account and credit its CBDC account; 6. When increasing numbers of consumers enroll for rCBDC accounts, the Federal Reserve should see positions of its Cash and CBDC accounts change, eventually achieving a state of equilibrium within a narrow range reflecting the ebb and fall of demand for cash and CBDC; 7. Assuming rational investors, inflation rates should also achieve equilibrium barring adverse natural and political events. Introducing rCBDC accounts and paying interest, pegged to the rate of inflation, would be the financial equivalent of shifting (no pun intended) from manual transmission controls to automatic transmission in automobiles – the speed of the vehicle (rate of inflation) automatically adjusts the gear (interest rate) at which the vehicle (economy) operates.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

The introduction of a U.S. CBDC is bound to create some disruptions. Market participants will naturally want to observe how CBDC are received, and how the technical infrastructure will perform. Since the CBDC's primary function is to offer a cash-equivalent instrument to enable smoother and less expensive transactions (while enabling inclusion and being green), the Federal Reserve should, initially, limit the amount of CBDC held by single end-users to meet the instrument's primary goal. As markets adapt to CBDC, the Federal Reserve should increase quantity limits based on the performance and stability of the technical infrastructure. It is not inconceivable that the amount of CBDC that can be held by a single consumer will become another tool in the Federal Reserve's arsenal to effect monetary policy. It would be natural to allow the Federal Reserve to vary this amount to effect monetary policy as it does currently with interest rates.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Any company that can meet and comply with the regulatory requirements of the CBDC initiative should be permitted to serve as intermediaries for CBDC. There is neither a monopoly on creativity nor competence, and the Federal Reserve as well as the U.S., will be best served with many participants choosing to serve different markets with their ingenuity. Since non-depository institutions are unlikely to hold CBDC or have similar privileges as depository institutions, the Federal Reserve should create a different regulatory structure to govern non-depository institutions without compromising on security and privacy controls.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes, it should. But, it need not be introduced on Day 1. Offline transactions will require many participants to adapt to different kinds of communication protocols. Depending on the devices that will choose to implement CBDC for online/offline transactions, the control requirements are likely to be different and this will require more time for adoption. It is recommended that

the Federal Reserve adopt offline capabilities on a graduated deployment schedule to moderate expectations and disruptions to CBDC introduction.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Given the significance of a U.S. CBDC introduction, it will be prudent to set expectations to the market that security must take priority over convenience. Despite some of the most advanced security technology being available for decades, private companies have persisted in using the weakest security and privacy controls within their applications, and are singularly responsible for the thousands of data breaches and billions of sensitive records being compromised. It does not matter if the company is a million, billion or a trillion dollar company: they have all been breached. This sorry state of the internet is simply because the vast majority of private companies have prioritized convenience over security. When it comes to cybersecurity, it is our observed opinion that private companies respond to the stick more than the carrot. Consequently, if the Federal Reserve intends to build a stable and secure CBDC infrastructure for the long-term, it should stipulate strong security and privacy controls, and create the appropriate infrastructure to enforce those requirements.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

CBDC represents a transition to a new ecosystem. Since almost every country is investigating an introduction of its own CBDC, it behooves the Federal Reserve to work with the BIS and establish global standards to facilitate interoperability. The standards must be open, royalty-free and available to anyone in the world – without cost – to implement. New standards are definitely likely. However, there are many existing standards that can be updated to meet the challenge. Given that cryptography will play a central role in security CBDC, the design must incorporate algorithm agility and state-of-the-art security controls. In light of the data breaches of the last two decades, an abundance of caution is not unwelcome.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

One cannot predict everything accurately in the technology world – everything is a matter of probability. As such, the Federal Reserve must make the assumption that principles and standards are the most important arbiters of success in an environment of continuous change. We have many tools in today's technological arsenal that can be applied to build a safe and secure technological ecosystem for CBDC; all that is required is the discipline to learn, adapt and apply the chosen principles/standards to craft the solution.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Software design, architecture and languages are like “hair styles of the geek world”. Every generation of software developers believes that the only viable technology to solve a specific problem is whatever is in fashion this year – and this is usually a function of the marketing messages of technology companies that invent a specific widget. As a consequence, we are at a point in technology history where we are living in software techno-babble. Senior executives responsible for delivery of information technology solutions are at the mercy of billion/trillion-dollar giants and have little understanding of what their application developers are doing. By the time, the company is in the news for the latest security breach, those programmers have long departed. The Federal Reserve would be wise to emphasize its focus on principles and standards. And, build a regulatory environment with the resources to enforce those principles and standards.

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*Name or Organization*

Sean Boyle

*Industry*

Individual

*Country*

United States of America

*State*

California

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Excessive financial surveillance goes against the spirit of the US constitution. It is up to all of us, and now it is especially up to YOU, to repeatedly reject changes that move our system in the direction of authoritarian tyranny.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

If a CBDC uses total financial surveillance, people may opt to use something else that grants them privacy. Thus, by using financial surveillance, you would completely forefit any influence over employment and prices.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Absolutely, unless you want to cede that to another entity. The general public will use money one way or another. Don't give them reasons to abandon yours.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Not at all. Take note of their successes and mistakes, but i strongly believe that this is not a "competition." China is not "winning" because their CBDC came first. The winner is the one who executes BETTER, not FASTER and certainly not more technologically. Paper cash

serves Americans well and it should not be brushed aside lightly.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

It can't. It's money. This is America. Freedom has costs. You can accept the costs, or you can become tyrants. There is no middle ground here. You can't half-surveil transactions.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Paper money fosters cyber resiliency. Do not stop issuing paper money.

*14. Should a CBDC be legal tender?*

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Issue paper money.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Quantum resistant cryptography is currently being developed with oversight by NSA and NIST. This could mean that everything about the CBDC will need to be redesigned from scratch in 10-20 years.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

Asher Hopp

*Industry*

*Country*

United States of America

*State*

California

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

CBDC's will, with absolute unequivocal certainty, be used as a weapon against those who use it. The government will spy on CBDC users. The treasury and IRS and law enforcement will use the CBDC network for asset seizure. The state department will leverage the CBDC network to attack people who they don't like. CBDC's represent the greatest form of pure evil ever seen from the United States of America. I've encouraged all of my family and friends to switch to Bitcoin and keep as few dollars as possible because of the government's reckless, immoral, and abusive financial policies. You are not to be trusted.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

There are no benefits to CBDC's outside of the government's quest to centralize authority and become more powerful. As government expands, liberty contracts.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

CBDC's have no positive impacts for civilians, the only benefit of CBDCs is for central authorities to exert dominance over poor people. If the US moves forward with its plan to get everyone on their CBDC, billions of people will revolt against the dollar and move to decentralized options. This is the worst idea the government has ever had. The second amendment is more critical than ever in these times due to your proposals.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Keynesian economics has been thoroughly debunked, and some bureaucrats in suits in DC moving numbers around on a spreadsheet is not the right way to create jobs or improve productivity. The demand side of the equation needs to be organic - the supply side of the equation needs your talents. If you are a Federal Reserve employee reading this message I encourage you to quit your job and pursue actual productive employment in a trade vocation instead of continuing to weaponize authoritarianism against anyone who tries to save their earnings.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

A CBDC will create massive financial instability as long as it exists, but after everyone revolts against this extreme tyranny and moves to decentralized currencies which are not subject to political manipulation such as Bitcoin we will usher in a new era of world peace, and Fed employees will need to re-train for vocational jobs.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

A CBDC will mark the beginning of the complete destruction of the US financial sector as nobody who is a customer of the US Dollar system is excited about the enhanced surveillance and authoritarianism you have proposed with your CBDC plans. When everyone

stops using the USD because of the corruption and ineptitude of your CBDC plans, there will be no participants left in the dollar-denominated financial sector.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Terminating the Fed's plans to move forward with a CBDC and asking Congress to pass a law permanently banning any and all forms of CBDC is the most effective way to mitigate adverse impacts of CBDCs.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Bitcoin is a peer-to-peer electronic cash network. Electronic cash will exist in perpetuity in the form of Bitcoin while the Federal Reserve cannibalizes whatever value is left in the US Dollar with extremist and authoritarian CBDC policies.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Without a CBDC all commerce and trade can be denominated in commodities such as gold, oil, Bitcoin, or any other physical asset. Delegating price control authority to the Keynesian cultists who lead the Fed Reserve, who have never worked in a vocational profession, is dangerous to our Democracy and must be resisted.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The Federal Reserve should be abolished and the US Government should be prohibited from manipulating domestic or foreign economies. We need a new bill of rights which includes the Separation of Money and State. The Federal Reserve's track record is atrocious and your activities have destroyed so many lives.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

The Federal Reserve has not adequately evaluated or provided public reports on the potential impacts of adopting Bitcoin as our national currency and reserve unit of account. Continuing to ignore Bitcoin will imperil the United States, and future generations will spit on the graves of inept bureaucrats who did nothing to advance the adoption of Bitcoin in the United States.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Without providing complete anonymity, CBDC's cannot improve privacy. Since 2001 the US government has, without mitigation, encroached further and further into mass surveillance regimes against its own citizens. CBDCs are the next step in your path towards subjugating the citizenry. If US laws force me to use CBDC's for any aspect of my daily life, I will expatriate myself to a less authoritarian jurisdiction and stop paying taxes to the IRS.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

100% of the cyber risks of your CBDC proposal are unavoidable. Without using a decentralized proof-of-work mechanism the CBDC will always be subject to exploitation. It is a system built to fail. In the last 2 decades every major bank and US government entity has been hacked. CBDCs will be no different.

*14. Should a CBDC be legal tender?*

CBDC's should not exist.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

CBDC's should not exist.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

CBDC's should not exist.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

CBDC's should not exist.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

CBDC's should not exist.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

CBDC's should not exist.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

CBDC's should not exist.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

CBDC's should not exist.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

CBDC's should not exist.

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*Name or Organization*

Guy Malone

*Industry*

Other: Bitcoin

*Country*

United States of America

*State*

New Mexico

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Americans know that the main governmental interest in CBDCs is to surveil and censor individuals who do not conform to the current regime's goals. We will not accept money that can be turned off based on our "Social Credit Score" or actions (i.e., protests, support for minority causes) that show our dissent and possible disgust with governmental policies.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes, if Americans used Bitcoin daily. All of the "potential benefits" of CBDCs are really the benefits of Bitcoin, which CBDC designers are now simply copying, yet adding risk of censure to our transactions and not solving - or even addressing - the problems of inflation.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

14. *Should a CBDC be legal tender?*

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

Gilbert A Blomdahl

*Industry*

Individual

*Country*

United States of America

*State*

Wisconsin

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

My experience is based on using Coinbase for a few years. Hackers as it is digital anything is possible with super computers, etc. Example: I purchased some odd new crypto on Coinbase and a few thousand disappeared in a matter of an hour and there customer service had no clue. Complexity of the digital wallets and ease of use for non computer person.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Perhaps not open sourced or only partially. Simplify and speed up transactions when using digital wallet. Regulate the banks and dealers and FDIC insure deposits

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Seems they are all into crypto already so it would just make it more official making more people at ease with it and trust it.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Wouldn't have to print it, less costly.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Positive because they are already allowing it and it is find but the dealers or handlers need to be regulated as that is where the hacking is occurring.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Might better stop illegal money laundering.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Regulation just not too many. Similar to banking regulations but more in digital sense. They already do physical currency through digital machines and statements so the transactions shouldn't be that hard.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes it is still important because if infrastructures are destroyed in a nuclear war or other such as Solar Flare events. Needs to be a plan how that is protected.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S.*

CBDC?

Illegals will take advantage of what they can and abuse is or will occur.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

May want to combine somehow as a world currency but dictator type countries may not play well.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Protect infrastructures from being destroyed in a nuclear war or other such as Solar Flare events. Needs to be a plan how that is protected.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

The digital world is the wild west so choose wisely and think about it very carefully.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Not sure. Hackers Scam artists

*14. Should a CBDC be legal tender?*

Maybe

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Yes if it is held

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

No

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Federal reserve and Banks and crypto exchanges

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

IDK

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes, By way of ID chip provided by the us gov replacing the SS# in the form of cell phone sim card or smart device.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Not sure Yes

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Alot

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

All Sorry not much help with this.

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*Name or Organization*

*Industry*

Other: Opinion

*Country*

United States of America

*State*

Illinois

*Email*

1. *What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*
2. *Could some or all of the potential benefits of a CBDC be better achieved in a different way?*
3. *Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*
4. *How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*
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6. *Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*
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8. *If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*
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12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*
13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

14. *Should a CBDC be legal tender?*

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20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

as it stands now, people are so subdued to accept what ever the software tells them that there will be so much unethical management of finances that people will be getting nickled and dimed to death. Even now in my town the cash registers (or the operators thereof) are consistently making minor errors (or perhaps they are intentional I don't know , but its happening all over the place and I steadily have to vocalize my disapproval and demand my nickels and dimes sometimes even refusing the purchase altogether) that is to say the clerks aren't going to pay attention and it seems that the undertone of the marketing techniques are to get one to be diverted and distracted and to hurry, hurry, hurry so as to not question a few cents or a dollar, or to imply cheapskatedness on the customer who admonishes the store's policy for such unethical behaviour or incompetent software or inaptitude of proficiency on the operator of aforementioned technology. my reply is if its not that big of a deal in regards 50 17 cents or 43 cents or a dollar , then why doesn't the store reverse the error in the customers favor and/or reduce the cost of their stock items ? Furthermore if it costs to use then screw that why not just use a credit card or a debit card. Hence the other factor, what backs it? It seems to me is that it is Marlboro miles and Camel dollars were seen to be a tactic of unscrupulous advertising targeting specific groups is not crypto currency the same. It seems to me that ole Philip Morris would be entitled to an outcome of favorable litagation on the grounds of all the malarkey that they and their customers were forced to endure in the form of excessive taxations, which the aforesaid malarkey is now being accepted and utilized as common procedural protocol. Also the U.S. dollar is core in U.S. economic trade policy. If implemented digital intermediaries should be subject to Federal Reserve oversight. The dollar is the standard set for currency, it stands on the credibility of the Federal Reserve. The dollar is a tool that even though its glow of unprecedented superiority as a medium for exchanging goods and services and to be used for debts both private and public can cause some persons with delequency it still, nevertheless is also effective in preventing unethical conduct and corruption via stipulations and strings and hoops . Also was not the big allure is that it is untraceable. That people could buy nuclear weapons, drugs, and modern day pizza gate slaves with it via "the dark web"? I concede that it is true that to ensure groundbreaking innovation we must work together (that is the consumer who's bartering and mediations of commerce and tax dollar revenues are the backbone and bone marrow of The United States of America's and the global economy and merchants as well as goverement), and when regulation fails to keep pace with innovation , vulnerable communities often suffer the falter. thank you.

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*



*Name or Organization*

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Academia

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- 1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*
- 2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*
- 3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*
- 4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*
- 5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*
- 6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*
- 7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*
- 8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*
- 9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*
- 10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*
- 11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*
- 12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*
- 13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

14. *Should a CBDC be legal tender?*

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

Mark Field

*Industry*

Bank, Small or Midsize

*Country*

United States of America

*State*

Illinois

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The biggest risk is the decimation of the current banking industry, and the catastrophic result to every community across America if the Fed allows a CBDC to bypass the longstanding partnership between existing banks and the Fed, thus depriving all communities of much-needed local capital with which to fund local credit needs.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

FedNow will actually resolve many of the “benefits” discussed in the papers put forth thus far, particularly once the “cross-border” transaction processes are perfected for FedNow. If someone has access to an online currency, then they would also obviously possess sufficient technology to be able to hold a free online account at a community bank and would therefore be able to access FedNow for instant, irrevocable, electronic payments.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Not unless a way is figured out to operate that process “offline”. If an unbanked person has the access and the desire to be online, then they can already use a bank account to initiate payments. Otherwise the net effect on the unbanked population will be neutral. You will never see 100% participation, no matter what you do, as some people will not trust any bank, and some will not trust government to keep from spying on them through their banking relationships.

*4. How might a U.S. CBDC affect the Federal Reserve’s ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

If the public is encouraged to hold CBDC, then those funds will no longer be “in circulation” and the multiplier effect/creation of money benefits of having those funds lent and re-lent by the local banks in American communities of all sizes cannot take place. That will impair economic activity and will restrain proper growth.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Risk is added to the process if the central-server-based service is hacked or is subject of a “denial of service” attack and people cannot then spend those dollars. Likewise, if one person or entity can control a large block of CBDC, the potential increases to disrupt markets if they later move to liquidate their position. Both issues would be negative.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

The financial sector cannot withstand the Fed encouraging people to divert their funds onto the Fed’s balance sheet and away from community banks. A CBDC would never become the criminals’ currency of choice, anyway, so there will always be a place for the other types of digital and crypto-based currencies as well as plain, old-fashioned cash. A

government-sponsored CBDC will also affect the financial sector by giving people a false sense of security in utilizing ALL digital currencies, thus causing some folks to unexpectedly lose value when they wander into other riskier digital currencies and inevitably suffer large losses.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

The best possible tool the Fed can use is its existing public-private partnership with banks to assist in “minting” and “redeeming” digital currency, just like the role that banks currently play in distributing coin and paper currency from and to the Fed on behalf of all consumers and businesses. Any effort that the Fed may take beyond simply offering a basic digital representation of currency and coin will adversely affect the financial sector.

*8. If cash usage declines, is it important to preserve the general public’s access to a form of central bank money that can be used widely for payments?*

Consumers never differentiate between “central bank money” and “commercial bank money”, so if the use of one or more payment apps becomes widely accepted among merchants and consumers alike, cash transactions will continue to diminish. There will always be those who do not trust banks OR the government and they will continue to collect and use cash. Consumers do not need “central bank money”. They need banks.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

FedNow will actually enable most of the benefits in this area without a CBDC even being necessary. Instant and irrevocable. Let’s see how that works in the marketplace before jumping into a CBDC.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The U.S. will continue to be the flight-to-safety, go-to place regardless of how soon we enter the digital arena. This is because of the decentralized partnership that exists between existing commercial banks and the Fed that provides for the most stable, most successful, and most resilient economic system in the world. International markets will not flock to a CBDC issued by a lesser government just because they have a digital representation of their currency available before we do.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Do not issue one.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Make sure that no law enforcement or governmental agency, or any other party, has access to the records of the CBDC central ledgers or the records of the banks who are actually doing the “minting” or “redeeming” of digital dollars, without first undergoing a rigorous “due process of law” procedure. Nothing should be allowed to be disclosed without a preponderance of probable cause and an official court-issued subpoena.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Hackers will hack. A central server will attract them like insects to a light at night. Hire reformed hackers to hack back at the perpetrators.

*14. Should a CBDC be legal tender?*

Not if that means that it will be absolutely required from the onset that every person in the country and every merchant be immediately required by law to accept CBDC even if they do not possess the technology necessary to process such payments. It will take time to build out the infrastructure necessary to accommodate such transactions.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

NEVER. That would put the Fed in direct competition with every bank account in the country, vying for retail consumers' deposits and decimating the primary funding source for local loans in communities across the country.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Yes. No one entity or identifiable grouping of entities should ever be able to sway the perceived value of a digital US dollar by influencing the volume of digital dollars that may be "bought" or "sold" within a short period of time. No one should EVER be allowed to go "short" or "long" on the digital dollar.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

ONLY FDIC-insured, legally chartered and properly regulated banks should ever be considered as an intermediary to distribute the digital dollar. The CBDC should only be taking the place of coin and currency in our lives, and not become a Trojan horse tool used to fundamentally change the banking industry and consolidate the country's economic power within the structure of the Fed. By keeping the current public/private partnership with banks in place for distribution, it will minimize the unintended consequences that will certainly occur if that process is opened up to other, non-bank intermediaries.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

This is the only way it will be helpful to the unbanked population. People with digital access have no reason to be unbanked at this time.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes. The same way FedNow will be. Through an "app" provided by their local bank.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

The apps that will be provided by local banks will allow for payments across all platforms, and if a CBDC is properly designed, it should be easily "redeemed" by the bank, which can then convert it to a FedNow, RTP, Same-Day ACH, or Regular ACH transaction, depending on the needs of the consumer.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

The thousands of existing free-market-based and privately-owned banks will stay up with or ahead of such technological advances, and will continue to provide access to those technologies to the consumer.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Similar to current cryptocurrencies, there must be anonymity to the end user when transferred from one bank to another, similar to how crypto moves from one "exchange" to another. Only upon discovery of seriously-suspected criminal activity should there be the ability to determine the identity of the user of those funds as they pass from one bank to another. And the proper due-process of law should then govern whether or not records should be turned over to any law enforcement agency or other governmental body. Banks know their customers. Customers should be protected unless laws are being broken.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Risks of a CBDC -> While paper currency can be counterfeited maybe its too early to comment on how easy or how hard it is to create fake CBDC ? What if the Fed / Us Treasury loses their private key which is used to create the CBDC ? Have any studies of this been done ? We should commission a team of (ethical) hackers to try and create fake CBDC. Potential Benefits--> Since CBDC is "digital currency" can we program it to be used only for some SIC Codes. For instance prohibit its use for Gambling or Drugs in any way ? Can we program it to give alerts on its "whereabouts" ?? From a payments perspective, already payments are mostly real time and mostly digital and mostly free. So the only additional benefit of a CBDC is a) reduction in Fraud b) reduction in fake / counterfeit circulation. Both these aspects need to proven via a POC or PILOT

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Financial Inclusion in the US for sure, should not be dependent on the launch of a CBDC. Other countries in Africa and APAC ( for instance India ) have achieved very high levels of Financial Inclusion by having a very well developed network of "Microfinance Institutions".

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Financial Inclusion in the US for sure, should not be dependent on the launch of a CBDC. Other countries in Africa and APAC ( for instance India ) have achieved very high levels of Financial Inclusion by having a very well developed network of "Microfinance Institutions".

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Based on this research paper, it appears that the US Fed does not intend to have "interest bearing CBDC". However, for effective Monetary Policy implementation, the Fed needs to control inflation, interest rates, money supply and buy-sell bonds( open market operations ). But all of these mechanisms will become difficult if the CBDC is not widely held and if it is not interest bearing

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Would the 2008 Mortgage Crisis have been averted if CBDC's were in use? The Pandemic and the Invasion of ukraine have caused inflation to rise at record levels across the world. Many central banks have had to raise the rate. Would a CBDC have prevented this ? Yes, CBDC, being digital, will afford greater control, better reporting and real time actions. To that extent, CBDC will help in tracking financial instability much faster. However many aspects need to be tracked to ensure financial stability- Stock markets, bond markets, FX markets, government debt situations, mortgage markets, global macro economic indicators, spikes in sectoral economic activity etc to ensure financial stability. CBDC will help ONLY if it is more widely held and ultimately replaces CASH altogether. Otherwise a parallel ( dark?) economy in cash will continue and we cannot track / trace that.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Depending on whether a CBDC Pays interest or not, it might affect the banks ability to raise deposits if people prefer to move their holdings from bank deposits into CBDC and thereby also reduce the banks' ability to grant loans and thereby impact the "money multiplier effect" of banking.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes. There should be one of two models Model 1--> Entire country moves to CBDC - includin retail customers and cash / cheques are sunset. The trend in many economies is one of declining usage of cash and cheques OR Model 2--> Where CBDC is used ONLY FOR INTERBANK SETTLEMENT and for settlement of FX , Securities Markets ( Money Settlement part ) etc. In this model, retail customers, SME and Corporates continue to work with existing commercial bank digital dollars.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Cross Border Digital Payments - ( Low Value Retail ) already there are numerous fintechs such as WISE, Remitly etc that have made these economical and quick. Would a retail client attach any more value to anything more faster, is extremely unlikely.Cross Border Digital Payments - ( High Value Corporate Transfers ) in the B2B space especially for Trade Finance, FX settlements, Inter company transfers etc - this is a white space today. While Swift GPI claims to enable X-Border payment finality ( for a significant %age of payments ) in under 30 minutes, still there are avenues for improvement here. However, this can only happen if both the central banks operate on a CBDC basis. We are already seeing some innovation in IXB - Immediate Cross Border payments across the US and Eurozones by leveraging two domestic real time payment rails ( SCT Instant and TCH RTP ) along with an FX provider to convert USD-EUR. And this is happening even without CBDC.Moot point is , today the cost of correspondent banking is very high. According to a 2016 McKinsey report, " Approximately \$5 trillion are sitting dormant in nostro accounts around the world—tying up capital that could be used in more productive ways ".According to Research conducted by East & Partners on behalf of Visa Inc. in June 2019, looking at cross-border payments across 20 countries, the finding was that the average cost of maintaining a single nostro account was approx \$30,000 and the total cost across all nostro's across these 20 major countries was over \$25m.In the absence of a US CBDC or a DLT based coin that can be used for cross border settlement, these costs are unlikely to go away. Already JPMCOIN ( Onyx initiative of JPMC ) and Visa B2B connect aim to use a digital currency to enable rapid cross border settlement in real time. So the absence or presence of a US CBDC is not got to alter market dynamics. The US Might as well join the bandwagon and have its own digital currency rather than be left behind.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The global economy is closely interlinked. Overseas nations have investments in the US and US firms have made investment in other countries. So if other countries ( as of now only Bahamas has a live CBDC ) are launching CBDC's, the US must closely follow the market and be prepared to have its own CBDC.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Most of the risks are raised.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Current Cash based model is completely anonymous and can be used for illicit transactions. CBDC, being digital, should be programmeable so that a) On movement from Wallet A to Wallet B, if the rules prohibit the transfer it needs to be stopped. One cannot juxtapose TOTAL PRIVACY and FULL TRACEABILITY. I think of the objectives of a CBDC should be to have FULL TRACEABILITY -- how many CBDC coins are in which wallet, what is the ID of

the wallet holder, KYC of the wallet holder and when it moves to WALLET B, the US FED and FINCEN / OFAC etc need to be made aware / alerted by the SYSTEM / DLT Network.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Since this is Digital currency and can be programmed, it can come pre-loaded with intelligence to ward off cyber attacks. Also, if the servers are distributed bringing down one server, should not impact the overall availability. This is one more reason that the FED must involve the commercial banks as intermediaries and allow them to raise CBDC deposits and disburse CBDC loans...

*14. Should a CBDC be legal tender?*

YES

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Yes because a) it will enable the Fed to better control monetary policy if the CBDC is interest bearing and also b) because it will allow banks to raise deposits ( in CBDC) and lend ( In CBDC) creating more availability of the CBDC and c) Retail and SME sector will have more faith / trust in a CBDC only if it is interest bearing.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

No. The end goal should be to go away from Cash and move to a full digital currency. There are no limits to holding USD Cash. So why have limits on holding CBDC ? In the initial period, if there are concerns, such a limit may be there, but otherwise, as a long term design, CBDC should not have limits.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Commercial Banks and Non Bank Financial Institutions subject to regulatory approval should be allowed to act as intermediaries for CBDC. Think of it like this - PAYPAL allows users to create Wallets and hold digital dollars. So entities similar to PAYPAL or of a similar structure could act as Wallet providers, deposit takers etc in CBDC. But they must all be subject to Financial Fed Rules and policies

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

If one interprets offline as "Paper instrument" or "Cash" and the ability to say, write a cheque denominated in CBDC, then that defeats the "digital" nature of CBDC. Mobile penetration and internet penetration is already very high. 5G networks also now enable very rapid internet connections and hence having an offline capability, may not be desirable for CBDC's

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes. Individuals already hold Crypto and other coins in their wallets on mobile apps. So why not also hold CBDC in their wallet and use it to pay merchants at checkout ?

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

A DLT based design would be secure and optimum given that other countries and private players are also considering a similar model.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

With regular paper currency and commercial bank "digital" account currency, the challenge of "technological obsolescence" was not there, now if CBDC is purely digital, there could be massive repercussions of an underlying tech stack version upgrade...imagine if all commercial banks, wallet providers, central banks, non bank Depository institutions had to upgrade from DLT version x to DLT version x+1 ?

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential*

*benefits of a CBDC?*

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*Name or Organization*

chris edwards

*Industry*

Academia

*Country*

United States of America

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Arizona

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

- negative interest rates - management fees - sanctions by govt - account deletion - its a platform for control and manipulation - digital financial "tech" for average consumer does not work well, e.g. smart phone pay

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

- yes. without the fed. res. being intermediary

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

- what does financial inclusion mean here? do you mean accessibility? - digital currencies may work for "saving", but not for bread, nikes, or a garage sale.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

- access would be a factor, as it appears this is a complex technology - maximum employment/price stability through CBDC is an abstract concept at present - i do not think many Americans, particularly on the right, would accept this as a payment method.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

- it would be a net negative, as what you are presenting is inherently complex

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

- in my view the financial sector would be first to prosper from this, as they would move to implement, and be private contractors for CBDC

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

- a security tool would be a non traceable ID # generated at each transaction - a PIN #.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

- yes. preserve cash payments/cash usage

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

- they don't need to evolve - keep them the same.

10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

- the U.S. should look after its own - it has not done this. the U.S. is bloody sending 40 billion dollars to Ukraine while Americans die on U.S. streets from homelessness and hunger.

11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

- yes. ensure the fed is not an intermediary. use public banking.

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

- the fed and govt worry "too much" about "illicit financial activity"

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

- funds should be insured. and there should be no way a third party, such as a hospital billing dept can lobby for access to and then pillage a client account for unpaid medical bills for example.

14. *Should a CBDC be legal tender?*

- no

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

- interest is ridiculous now. i have like thousands in a savings account and i make like 29 cents a quarter

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

- yes, a country could park its currency to evade negative interest rates.

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

- a public banking firm should be used. its as it they have been outlawed by this country. the last entity to serve as an intermediary, for example, would be Chase Manhattan Bank - they are arrogant and inaccessible.

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

- just use cash.

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

- there is little ease of use now with contemporary payment systems. the use of cell phone pay is increasing, yet it is slow, unwieldy, and non functional - it appears CBDC would be the same.

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

- use the technology large banking firms and commodity traders use for accurate, instant transactions

21. *How might future technological innovations affect design and policy choices related to CBDC?*

- that they be used for control and manipulation by govt

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

- you didn't do yourself any favors by making this paper so long and complex. - simplify, simplify - but I would bet that is too threatening for you.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The Federal Reserve begins its paper with the statement that a healthy, well-functioning economy requires the nation's citizens to have confidence in its money and payments services. Since the latter half of the nineteenth century, Iowa banks have gradually earned the trust and confidence of the citizens of Iowa. This confidence has been preserved throughout decades of accelerating change in service delivery channels, new technology adoption and payments. Trust often correlates to a customer's proximity to a given service provider, especially when it comes to financial services. Iowa's expansive network of community banks is a case in point. A 2019 study by Iowa State University, published in the Journal of Financial Economics, found that growing up in a community with or without a financial institution has a long-term effect on how you build and manage credit. The co-author of the research and Chair of Finance at Iowa State University reported that early exposure to local banking increases financial literacy and trust. Relationship banking is the hallmark of Iowa's community banks. It's no coincidence that Iowa has more banks per capita than any other state, while we also boast one of the nation's lowest rate of unbanked citizens at 2.6% of our population, according to a 2019 FDIC study. This rate of unbanked in Iowa is nearly half the national average of 5.4%. A recent study conducted by WalletHub.com also found Iowa to be one of the most financially literate states in the nation. Iowabanks demonstrated the value of relationships during the early, difficult days of the COVID-19 pandemic. They efficiently delivered \$8 billion in paycheck protection program loans to thousands of small businesses, saving approximately 800,000 Iowa jobs. The value of these main street and farm relationships to Iowa's economy cannot be overstated. Any discussion of a Central Bank Digital Currency (CBDC) first and foremost should do no harm to this time-tested method of delivering financial products through intermediary financial institutions.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Contrary to popular belief, a U.S. CBDC is not necessary to "digitize the dollar," as the dollar is largely digital today. However, the issuance of a CBDC would fundamentally rewire our banking and financial system by changing the relationship between citizens and the Fed. As

this work progresses, there is a growing recognition the deployment and use of CBDCs would be weighed down by very significant real-world trade-offs. The main policy obstacle to developing, deploying, and maintaining a CBDC in the real economy is the lack of compelling use cases where CBDC delivers benefits above those available from other options. Today we use both public and private money. In developed economies public money, which includes cash and accounts held directly at the Federal Reserve, make up about 5% of money. The other 95% of money is private money – funds held as a liability of a private institution like a bank or credit union. Private money is important to us all because it is created through productive financial intermediation by banks in the form of lending and hence represents expansion, and usually a multiplication, in real economic output. The decision to introduce a CBDC would be a deliberate decision to shift this balance back to public money. If instead, our objective is to realize the benefit of technological innovation, we should look to leverage novel developments in private money (like real-time payments systems and well-regulated stablecoins.) Private sector innovation in banking and payments has made a significant contribution to establishing the U.S. dollar as the reserve currency of the world and is best positioned to support it in the years to come. In a recent IntraFi Network Banking with Interest podcast, former Federal Reserve Board Governor Randall Quarles said European Central Bank (ECB) leaders had estimated a CBDC would disintermediate from twelve to twenty percent of EU deposits. These are bank deposits that would become a liability of the ECB, while reducing liquidity at private lenders. Governor Quarles suggested if this model were duplicated in the United States, disintermediation would cause significant disruption to our economy, in exchange for very modest benefits. This would also further politicize our central bank as lawmakers realize the value of a direct financial pipeline to the private sector “with strings attached”. We agree with the Governor’s assessment. The benefits of a CBDC do not outweigh the potential disruption to our economy, and runs counter to the principals of a decentralized free market system. It’s certainly not hard to envision where money would flow during a time of crisis if a CBDC, without credit or liquidity risk, were a retail option. Runs on private sector financial firms would become more likely or more severe, threatening the safety and stability of the US financial system.

7. *What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

8. *If cash usage declines, is it important to preserve the general public’s access to a form of central bank money that can be used widely for payments?*

9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

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13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

14. *Should a CBDC be legal tender?*

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

As stated in the Federal Reserve's Paper, the Federal Reserve Act does not authorize direct Federal Reserve accounts for individuals, and such accounts would represent a significant expansion of the Federal Reserve's role in the financial system and the economy. At this time, the presumed benefits of a CBDC seem to be improved cross-border payments, financial inclusion, and support for the dollar's international role. A case can be made that these improvements will be modest at best and could come at a heavy cost to our economy by reducing the aggregate deposits in the banking system. This outcome would, in turn, increase bank funding expense, reduce credit availability and raise credit costs for households and businesses. Given the high stakes, it is important we get this right, which is why IBA supports the Federal Reserve's thoughtful and considered approach. The Fed's discussion paper takes a balanced view of the opportunities and risks associated with issuing a CBDC in the United States. The discussion paper also sets an appropriately high bar for action on a CBDC. We believe that the Federal Reserve should not move forward without a clear analysis that shows the benefits of issuing a CBDC outweigh the risks and that doing so would not create adverse impacts on consumers, markets, or the economy. This analysis must necessarily take into account whether a CBDC is the most effective way to realize these benefits. We also agree with the Fed's assessment that the introduction of a CBDC would require Congressional approval in the form of an authorizing law. As the Iowa Bankers Association evaluates the likely impacts of issuing a CBDC it has become clear that the purported benefits of a CBDC are uncertain and unlikely to be realized, while the costs are real and acute. Based on this analysis, we do not see a compelling case for a CBDC in the United States today.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The Federal Reserve's January 2022 discussion paper touched on a number of potential benefits, risks, and policy considerations relevant to a central bank digital currency (CBDC). However, the list of potential risks was particularly understated: only two paragraphs considered the balance of protecting financial privacy and preventing financial crimes. As noted in the discussion paper, financial institutions are already required to report large sweeps of financial activity in compliance with the government's attempt to combat money laundering and terrorist financing. In doing so, the paper appears to be suggesting that a CBDC would not be different from existing digital money. While it may be true that a CBDC could be largely identical to existing digital money, there would be a significant difference in that a CBDC would provide the opportunity to establish a direct line between the government and the public's financial activity. In doing so, a CBDC would erase what little financial privacy still exists in the United States. In fact, the threat to financial privacy may be the single greatest risk of a CBDC. And it's due to the significance of this risk that it is particularly disappointing that the discussion paper devoted so little time to the issue. The "intermediated CBDC model"—something which largely appears to be a retail CBDC with extra steps—described in the discussion paper may be able to be designed sufficiently to prevent a direct line between the government and the public by using third parties (i.e., banks and other financial institutions) to interrupt the flow of information. But even here, financial privacy is still at risk. One of the few constraints on the third-party doctrine is whether the information revealed was in the ordinary course of business. While financial institutions do not track down the journey of each dollar bill in the ordinary course of business, a CBDC would likely have a record of its transactions and make that data available to financial institutions. Therefore, that newly available data would likely be added to the existing reporting requirements and thus create a much larger data pool for law enforcement to pull from during investigations. Worse yet, even if that newly available data is not added to reporting requirements initially, it still creates a much larger data pool. So whether it is done directly or in an "intermediated" fashion, a CBDC poses a significant risk to Americans' financial privacy. And it's not just a risk of quiet observance. The use of the Emergencies Act in Canada to freeze the bank accounts of protestors earlier this year showed that Americans should be aware of the extent the government can go to exert control. A CBDC would dramatically increase that risk.

Suggested Reading Norbert J. Michel and Jennifer J. Schulp, "Revising the Bank Secrecy Act to Protect Privacy and Deter Criminals," CMFA Working Paper No. 007, April 14, 2022, [https://www.alt-m.org/wp-content/uploads/2022/04/RevisingTheBankSecrecyAct\\_NorbertMichelAndJenniferSchulp\\_CMFAWP007.pdf](https://www.alt-m.org/wp-content/uploads/2022/04/RevisingTheBankSecrecyAct_NorbertMichelAndJenniferSchulp_CMFAWP007.pdf). Nicholas Anthony, "How Canada Made the Case for Cryptocurrency, Not CBDCs," Cato Institute, March 2, 2022, <https://www.cato.org/blog/how-canada-made-case-cryptocurrency-not-cbdcs>. Nicholas Anthony, "Why Don't Americans Have Stronger Financial Privacy Rights?," Cato Institute, October 28, 2021, <https://www.cato.org/blog/why-dont-americans-have-stronger-financial-privacy-rights>.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

In a report titled, "Central Bank Digital Currencies: Six Policy Mistakes to Avoid," Douglas Elliott and Larissa de Lima warn that officials should be careful not to ignore other policy tools when thinking about the design of a central bank digital currency (CBDC). At the moment, it appears almost all of the potential "benefits" of a CBDC would be better left to existing efforts.

**The Payments System** Improving the payments system in the United States is an effort that long overdue, but a CBDC would pose little benefit given the existing developments in both the public and private sectors. First, the Fed itself expects to launch FedNow in 2023—an effort that is specifically designed to improve the payments system. Though to achieve this goal, FedNow could even be shut down today and the Fed could simply expand its operating hours to improve payments speeds. Second, before the FedNow initiative interrupted the private sector's progress, the RTP Network was well on its way to successfully introducing real time payments across the country. Third, stablecoins have offered another private-sector solution to payment delays by making transactions possible 24 hours a day. So between the Fed's own efforts and the innovations in the private sector, it appears that a CBDC would do little to uniquely improve the payments system. **Financial Inclusion** Financial inclusion is a worthy goal, but a CBDC is not a worthwhile solution. As far as what a CBDC might offer that is not already available, it's unclear what unique benefit it might offer precisely because there is so much private-sector competition taking place. The Bank On initiative and adoption of mobile banking are giving underserved communities greater access to the financial system. The Federal Deposit Insurance Corporation's (FDIC's) 2019 survey on banking and financial services seems to suggest these services are making a real improvement in the space considering the unbanked households in the United States have steadily decreased from 8.2 percent in 2011 to 5.4 percent in 2019. By the time a CBDC is released, that number might be nearly zero. And best of all, options like cryptocurrencies, cheaper check cashing, and prepaid cards continue to reduce the burden of being unbanked.

**The World Reserve Currency** Preserving the dollar's world reserve status is also described as a potential benefit of a CBDC, but this too falls short. Put simply, any improvement to the dollar is likely to help support its international status. For instance, improving financial privacy protections, payments speeds, and transparency in monetary governance would likely benefit the dollar's international status. It's hard to imagine how a CBDC is unique in any other way than in terms of getting the United States a seat in the "digital currency race." And even then, it's not clear that this race is one the United States needs to win. "Going digital" may be an improvement for some foreign currencies, but those currencies still have many other problems that prevent them from being used on an international scale. China's own CBDC may be the best example of this problem: China may be leading in the digital currency race, but few people are flocking to it considering the country's history of human rights and privacy violations.

### *3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

A central bank digital currency (CBDC) is unlikely to affect financial inclusion substantially. Not only have the number of unbanked individuals been steadily decreasing over time, but the reasons people give for being unbanked are unlikely to be assuaged by a program from the federal government. The Bank On initiative, mobile banking, and cryptocurrencies are all giving underserved communities unprecedented access to the financial system. For instance, the Federal Reserve Bank of St. Louis found that nearly 4 million accounts were opened in 2020 due to the Bank On initiative—an initiative designed to increase the availability of low-cost deposit accounts. Mobile banking has experienced similar success: it was the main way to access one's bank account for only 9.5 percent of households in 2015, but it rose to 34 percent by 2019. The Federal Deposit Insurance Corporation's (FDIC's) 2019 survey on banking and financial services seems to suggest these services are making a real improvement in the space considering their growth has coincided with unbanked households in the United States steadily decreasing from 8.2 percent in 2011 to 5.4 percent in 2019. With those factors set aside, it is unlikely that a CBDC would win wide support among the un- and under-banked population unless it offers credible privacy protections and intermediary-free services. The 2019 FDIC survey found that trust and privacy were cited as two of the top three reasons for not having a bank account. A "government bank account" is likely to be an even less appealing prospect for the respondents—even if it is merely a digital wallet.

**Suggested Reading** Federal Reserve Bank of St. Louis, "Bank On National Data Hub: Findings from 2020," December 22, 2021, <https://www.stlouisfed.org/news-releases/2021/12/22/st-louis-fed-releases-the-bank-on-national-data-hub-findings-from-2020>. Paul Calem and Yasmeen Abdul-Razeq, "What Drives Household Financial Inclusion? Analysis of Data Exposes Myths and Identifies Opportunities," Bank Policy Institute, May 3, 2022, <https://bpi.com/what-drives-household-financial-inclusion-analysis-of-data-exposes-myths-and-identifies-opportunities/>. Federal Deposit Insurance Corporation, "How America Banks: Household Use of Banking and Financial Services," October 2020, [https://economicinclusion.gov/downloads/2019\\_FDIC\\_Unbanked\\_HH\\_Survey\\_Report.pdf](https://economicinclusion.gov/downloads/2019_FDIC_Unbanked_HH_Survey_Report.pdf). Nicholas Anthony, "Only Six People Used the Postal Banking Pilot Program," Cato Institute, March 30, 2022, <https://www.cato.org/blog/only-six-people-used-postal-banking-pilot-program>.

4. *How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*
5. *How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*
6. *Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Where stablecoins and other nonbank moneys (e.g., cryptocurrency) complement and build off of the financial sector, a central bank digital currency (CBDC) could undermine it. It appears to be likely that a CBDC would have a negative impact on financial stability. A CBDC offered at the retail level poses substantial disintermediation risks. In short, by offering an option that is safer than the average deposit account, a CBDC would increase the risk of bank runs in times of stress. Both the Fed and the Bank of International Settlements (BIS) have recognized this risk in the past, "Depending on the design and adoption of a CBDC, there may be broad market structure effects. There is a risk of disintermediating banks or enabling destabilizing runs into central bank money, thereby undermining financial stability. Today, the public can (and have in the past) run into central bank money by holding more cash, but such runs are very rare, given the existence of deposit insurance and bank resolution frameworks that protect retail depositors. [A] widely available CBDC could make such events more frequent and severe, by enabling "digital runs" towards the central bank with unprecedented speed and scale ... [If] banks begin to lose deposits to CBDC over time they may come to rely more on wholesale funding, and possibly restrict credit supply in the economy with potential impacts on economic growth." As should be clear from BIS's account, the Fed's entr into the digital currency landscape differs significantly from the private sector initiatives (e.g., cryptocurrencies, stablecoins, etc.) in that the Fed's entry would risk an unprecedented tilting of the playing field. Suggested Reading George Selgin, "Central Bank Digital Currency as a Potential Source of Financial Instability," Cato Journal, Spring/Summer 2021, [www.cato.org/cato-journal/spring/summer-2021/central-bank-digital-currency-potential-source-financial-instability](http://www.cato.org/cato-journal/spring/summer-2021/central-bank-digital-currency-potential-source-financial-instability). Board of Governors of the Federal Reserve System, "Regulation D: Reserve Requirements of Depository Institutions, 12 CFR Part 204," Federal Register 84, No. 48 (March 12, 2019, [www.govinfo.gov/content/pkg/FR-2019-03-12/pdf/2019-04348.pdf](http://www.govinfo.gov/content/pkg/FR-2019-03-12/pdf/2019-04348.pdf). Bank for International Settlements, "Central Bank Digital Currencies: Foundational Principles and Core Features," <https://www.bis.org/publ/othp33.pdf>. Nicholas Anthony, "Congress Should Welcome Cryptocurrency Competition," Cato Institute, May 2, 2022, <https://www.cato.org/briefing-paper/congress-should-welcome-cryptocurrency-competition>.

7. *What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*
8. *If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*
9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*
10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Every nation in the world could adopt a central bank digital currency (CBDC), but that alone would not be a justification for the United States to follow suit. Both lawmakers and regulators must be careful to distinguish between keeping up with the Joneses and learning from the experience of others. Decisions by other nations should inform the decisions made by the U.S. government regardless of the subject area so long as the relative conditions are considered, and no decision is considered a panacea. To that end, lawmakers should shift their focus away from trying to win the "digital currency race" and towards strengthening the dollar. It is unlikely that the majority of people who rely on the U.S. dollar will switch to the Chinese yuan, Russian ruble, or Nigerian naira simply because those countries offer a CBDC—especially considering the U.S. dollar system is already largely digital. Suggested Reading Nicholas Anthony, "Congress Should Welcome Cryptocurrency Competition," Cato Institute, May 2, 2022, <https://www.cato.org/briefing-paper/congress-should-welcome-cryptocurrency-competition>.

11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

14. *Should a CBDC be legal tender?*

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

Aside from the many potential practical problems, interest payments on a central bank digital currency (CBDC) could risk exposing the Fed to a new wave of politicization—especially when officials try to use negative interest rates and above-market rates to spur spending and saving, respectfully. In fact, determining the appropriate level of competition with private financial firms will likely be difficult. First, it's unclear what market failure the Fed would be stepping in to solve by paying interest on a CBDC when there are numerous available interest-bearing alternatives in the private sector. And second, it's unclear how effective interest payments would be considering the policy will have to decide whether the upper bound on interest paid to CBDC holders will take the rate paid to reserve accounts into account. Failure to do so (i.e., exceeding private-sector interest rates) would likely increase both disintermediation risks and political risks as industries and the public vie for one policy over another. Suggested Reading George Selgin, "Central Bank Digital Currency as a Potential Source of Financial Instability," Cato Journal, Spring/Summer 2021, [www.cato.org/cato-journal/spring/summer-2021/central-bank-digital-currency-potential-source-financial-instability](http://www.cato.org/cato-journal/spring/summer-2021/central-bank-digital-currency-potential-source-financial-instability).

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

If a central bank digital currency (CBDC) were to be created in the United States, it should not be subject to quantity limits at any stage. Although China's CBDC uses a model in which users must relinquish increasing levels of privacy in return for higher account balance limits and others have argued account limits can protect consumers from losses, the United States should allow consumers to choose what amount best fits their needs regardless of how high or low that amount is. More so, there should not be reporting thresholds where users are allowed to exceed certain levels, but are, in turn, reported for doing so. In that sense, the United States would simply be mirroring China's model—albeit, in a more roundabout fashion. It might not be most productive or even the safest choice to hold one's money in one account over another, but it should ultimately be up to each individual person, nonetheless. Much like with the case against using negative interest rates on a CBDC to spur spending, it is not the federal government's role to decide how individuals use their money.

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

The current trend of technological innovation seems to suggest that a central bank digital currency will soon be unnecessary. The number of unbanked households continues to fall each year due partly to the rising adoption of mobile banking; innovations within stablecoins

and cryptocurrency more broadly have presented unprecedented access to the financial system; and fintech companies continue to make new advances in financial services. In looking to the future to see what place a CBDC might have, it seems most likely that it has no place at all. Suggested Reading Federal Deposit Insurance Corporation, "How America Banks: Household Use of Banking and Financial Services," October 2020, [https://economicinclusion.gov/downloads/2019\\_FDIC\\_Unbanked\\_HH\\_Survey\\_Report.pdf](https://economicinclusion.gov/downloads/2019_FDIC_Unbanked_HH_Survey_Report.pdf).

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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**1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?**

Privacy risk is mentioned but insufficiently considered. The flagship CBDC under development right now is China's digital yuan, whose entire purpose is to eliminate every vestige of financial privacy in China's increasingly totalitarian, panopticon regime. It is fatuous to pretend that a digital dollar is anything other than an attempt to "keep up with the Chinese." But there is absolutely no reason for this; China also has highly efficient cell-phone based payment systems, like Alipay and WeChat, that in some respects are more efficient than American check-writing and debit cards -- but again, these have zero privacy features, and are constantly exploited by the Chinese government to monitor and control people's private lives. Such measures may be consistent with China's long tradition of absolutism, but are utterly incompatible with the American system. Our system may be a bit "messier," but freedom always is, in contrast to the ruthless efficiency of centralized control. And a CBDC, no matter the professed good intentions, will end up diminishing American financial privacy, if not, in the longer run, negating it altogether in the name of competing with China. Also note that the emphasis on need for smoother, more streamlined cross-border movement of currency will also facilitate the creation of some kind of global currency -- another monumentally bad idea.

**2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?**

The current system has proven more than adequate. In particular, the strength of the dollar resides less in the speed of its convertibility than on its underlying stability and on international confidence in its long-term reliability. These are ultimately fiscal and monetary considerations, not questions of exchange mechanisms.

**3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?**

**4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?**

How could a CBDC fail to be extremely inflationary? It would require, in effect, the at-will availability of Fed funding for extension of credit by commercial banks and other intermediaries, i.e., in direct response to consumer demand for money (and in much greater quantities, of course, than consumer demand for old-fashioned cash). It might have an effect similar to, e.g., the Fed directly negotiating with the Treasury to purchase newly-issued debt, instead of buying and selling already-existing securities via traditional open market operations. Has anyone even considered the monetary moral hazard and inflationary pressure that retail CBDCs might entail?

**5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?**

See answer to question 4. My best guess is that it would incentivize much sharper rates of inflation, in reaction to the unquestionable demand for such a convenient new form of money, especially where any retail CBDC is concerned.

6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?

See answers to 4 and 5.

7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?

Any safeguards designed to limit the inflationary risks of such an instrument would probably also diminish its efficiency and, hence, its attractiveness to consumers. Consumers love easy money in any form, moral hazards and all -- but that does not mean it is good policy in the long range.

8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?

Yes. Absent hyperinflation, cash (like precious metal and other "old-fashioned" transactional mediums) will always have features that will make it attractive to consumers, privacy being one of them.

9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?

Impossible to say, but the clear implication in the paper is that we need to keep up with the likes of China or risk having the dollar's status as the world's reserve currency eroded. However, the status of the dollar is less dependent on efficiency in narrow, technological terms than upon underlying confidence in the long-term strength and viability of the U.S. economy. Some may initially choose the digital yuan for its efficiency, just as many countries bought into the "One Belt, One Road" initiative -- only to find out that doing business with China was altogether different than doing business with the West. In similar fashion, the digital yuan will allow the Chinese government to track financial data all over the world, including any other CBDCs linked to the yuan. That alone should be a basis for staying out of any international CBDC system, and advising other countries to do the same. And if cross-border payments retain some of their present inefficiencies, then so be it.

10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?

See answer to question 9. Bottom line: an international CBDC system such as both this report and the recent BIS report contemplate would amount to yet another foolish codependency with China, and one the Chinese will be only too happy to exploit.

11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?

A better question would be: Are there additional risks not raised in this paper? See responses to preceding questions on the systemic dangers posed by China's digital yuan.

12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?

It would be impossible. Significant concessions in the area of personal financial privacy would be unavoidable, even if, contra the Chinese, the goal of an American CBDC would be to enhance convenience while safeguarding privacy.

13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?

14. Should a CBDC be legal tender?

Emphatically not. At most, it should be a voluntary market alternative that consumers are free to reject in favor of other forms of payment. Otherwise, whatever privacy compromises end up being baked into CBDC design features will be forced on people, since everyone, and every bank account, will then need to be forced to accept CBDC payment, with everything that goes with it.

15. Should a CBDC pay interest? If so, why and how? If not, why not?

No, if its goal is truly to be nothing more than a digital equivalent to Federal Reserve notes. Also, interest accrual would be still more potentially inflationary than retail CBDCs themselves.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

In theory, this would be a necessary expedient to cap the supply of CBDCs in the overall money supply (would CBDCs be reckoned as M1? We assume so.). But actually keeping track of such numbers would be well-nigh impossible, as well as impractical. How, for example, could a cap be imposed in the issuance of a large commercial loan, as to what percentage of the loan could be extended in CBDCs?

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

I believe that the discussion paper does a good job outlining potential benefits of a CBDC.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

I believe that all those potential benefits could be better achieved with private digital media: (1) "broad access to digital money that is free from credit risk and liquidity risk. This can also be achieved by Private-Market Digital Currencies (PMDCs), provided their suppliers can have Fed Master Accounts, and can thereby fully back their digital monies with the Fed's "wholesale" digital deposits. This option resembles the Fed's "intermediated" CBDC, but with advantages I will come to. (2) "help to level the playing field in payment innovation for private-sector firms of all sizes." I do not believe that a CBDC can serve this purpose as well as PMDCs can, because a CB can never compete equally with private payment-media suppliers. Despite the DEDMCA, the Fed can cross-subsidize its payments products; it can even supply media and services at a loss, without itself ever "failing." (To get around the DEDMCA, it only has to claim some overarching public need.) Finally, the Fed regulates many of its actual and would-be rivals, including any that has or seeks to have an account with it. (3) "a CBDC might generate new capabilities to meet the evolving speed and efficiency requirements of the digital economy." The key to dynamic innovation is a hotly contested digital currency market. For reasons I gave in (2), I believe that the Fed's entry into that market will discourage entry by other firms, thereby reducing the prospects for efficient innovation instead of enhancing them. (4) "streamline cross-border payments." The main challenges here stem from the reality that ours is a multi-currency world. The Fed certainly should play a role in overcoming them, but I do not believe that a CBDC itself supplies a solution better than what private media can accomplish. (5) "preserve the dominant international role of the U.S. dollar." The PMDCs or CBDC than can best do this is the one that is most efficient and versatile, and that therefore adds the most to the attractiveness of the USD and its various representatives in global payments. I believe that the Fed can best preserve and enhance the USD's status by encouraging the fullest-possible development of safe PMDCs. We can thereby do better than China will with its alternative, top-down approach. Currency is not so unlike other goods in this respect as many suppose. (6) "reduce common barriers to financial inclusion and ... lower transaction costs." DC is inherently free of many of the "common barriers" to financial inclusion. But here again, I believe that PMDC offers the best prospects. The unbanked are so for many reasons, ranging from high costs of keeping bank deposits to distrust of banks to mere distance from bank facilities. "Including" as many of them as possible calls for a variety of different DC solutions catering to their distinct wants. "Tokenized" DC that can be used by persons who do not wish to have bank accounts, but who do have mobile devices, can be especially important. Innovative retail interfaces will also be especially important. Finally, the lowest cost alternatives are most likely to be ones developed by private entrepreneurs facing stiff competition. For all these reasons, I believe the Fed should promote safe PMDCs, rather than enter the market itself.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Of course, CBDC, understood simply as an additional alternative to legacy payments media, can only enhance inclusion: there may well be some unbanked persons who do not wish to

have or cannot afford ordinary bank deposits who would be glad to keep Fed cheaper accounts, direct or intermediated. The real questions are whether PMDC's might eventually be still more effective in banking the unbanked, and whether, by introducing its own CBDC, the Fed will also limit the extent of PMDC entry and innovation. I believe that the answer to both of these questions is "yes." I also believe there are many ways the Fed and the Congress might encourage private-market suppliers to make a special effort to cater to the unbanked.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Provided that growth in the demand for it isn't accompanied by disintermediation of private-market depository institutions, a future CBDC needn't complicate monetary policy any more than the Fed's ability to issue paper currency does. Steady growth in the demand for CBDC might then call for like growth in the size of the Fed's balance sheet, other things equal. But such growth can be readily provided for. If, instead, the demand for real CBDC balances increases at the expense of ordinary banks, and particularly if it leads to a very substantial and sudden disintermediation of bank deposits, the Fed may have to act aggressively to prevent any resulting decline in total bank deposits from causing money market rates to spike, and otherwise causing it to meet its monetary policy targets. I discuss this possibility further in the next section.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

The most obvious financial stability implication of CBDC consists of the risk it poses of a sudden disintermediation of the legacy banking system. This might happen during a crisis in which uninsured depositors, and perhaps some insured ones as well, "run" into CBDC. Such a run is far more likely than a run into paper currency, the hoarding of which is risky and extremely inconvenient. Today, rather than hoard currency, sophisticated depositors tend run from banks they distrust to others they trust more, leaving the banking system as a whole intact. A CBDC option, however, makes running from the whole banking system much more tempting, especially when there is even a shade of doubt concerning every bank's condition.

This risk is all the greater if CBDC balances pay a relatively attractive interest rate, as some proposals contemplate. What's more, if the interest rate on CBDC ever exceeds that paid on bank deposits, a disintermediation crisis might occur even in the absence of any distrust of ordinary banks! In principle, the Fed could avert such a crisis by not paying interest on CBDC balances, or by paying a relatively low rate only. But many CBDC proponents will argue that doing so will penalize the very persons they'd most like to see CBDC balances serve. Indeed, quite a few believe that Fed accounts should pay the same interest rate as banks earn on their reserve balances--which is necessarily more than what banks can profitably pay their own depositors (and much less than banks actually pay). A Fed run by technocrats, subject to no political pressure whatsoever, could in principle set the rate it pays on CBDC at levels consistent with preserving financial stability--even including negative rates now and then! But the real Fed is not in any such privileged position. As it stands, its administered rates are already set by the Fed Board, rather than the FOMC; and while the Board has thus far deferred to the FOMC in setting them, it is most unlikely that it will be allowed to take the same approach to setting the rate the Fed pays on public Fed accounts. In any event, it would not be prudent for the Fed to pursue a CBDC option that could find it facing an intermediation crisis with its hands tied. The scenario is not so farfetched. Earlier this century, Postal Savings accounts paid a rate of interest set by Congress. During the Great Depression, interest rates generally collapsed. But the rate on postal savings didn't. Consequently, depositors moved as much money as they could out of ordinary banks into postal accounts, adding to banks' already severe problems. Had it not been for caps on those postal savings accounts, every last surviving commercial bank and savings and loan company might have gone under.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Here I'll just address the stablecoin alternative. Unlike the Fed, a PMDC issuer would have to cover its operating expenses to remain profitable. Consequently, even if it kept 100% reserves at the Fed, and earned the same interest rate on those reserve balances that banks earn, it could not pay the same rate to its DC holders. Indeed, because it would not make loans or other risky but higher-return investments, it might generally be expected to pay less than banks can afford to pay on ordinary deposits. So PMDC, or safe PMDC at any rate, including safe (or "narrow") 100% reserve-backed stablecoins, would not pose the same disintermediation risk as CBDC.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

I believe I've covered these questions above, in discussing the (theoretical, but in my opinion impractical) possibility of varying the return on CBDC balances so as to prevent disintermediation crises.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

The fact that cash \_usage\_ declines is no reason why the public should ever be denied access to cash if it wants it: only the Fed itself can deny people access to its paper notes by refusing to supply them on demand, usually indirectly through banks that act as middlemen. My understanding is that the Fed has no intention of ceasing to supply paper money. Therefore the public will always have access to some sort of central bank money, whether the Fed supplies CBDC or not. Should it ever be "necessary" for the Fed to supply CBDC so that the public doesn't have to hold private currency or deposits, the Fed itself must be the reason! This doesn't mean that people will continue to use paper money for ordinary transactions. In principle, they might stop using it altogether, as has (almost) happened in Sweden. But then paper currency would only vanish \_because nobody wants it\_. And it would vanish only until someone decided that, for whatever reason, they wanted some. Banks would, presumably, continue to keep some on hand for the sake of such eccentrics; and if one didn't, help would, presumably, be only a phone call and an armored truck away.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Domestically especially, everything will depend on how the Fed and other regulators treat prospective PMDC issuers. If they take a generous, but still not reckless, approach, they will create an environment that's as conducive as possible to the entry of safe suppliers of PMDC, including mobile money services, stablecoins, prepaid token issuers, and other sorts. The most important requirement here is that these outfits be allowed to join the existing USD payments network, in which the Fed serves as a supplier of both safe reserves wholesale settlement services. The Fed can do its part particularly by clarifying and easing its requirements for granting Master Accounts to licensed banks, especially by readily accommodating applicants with "special purpose" banking charters. This doesn't mean that it should impose no conditions on such applicants. On the contrary: it may, and probably should, insist on strict liquidity requirements, if not on 100% reserve backing of their liabilities. Such banking should, however, be considered an alternative to deposit insurance, for the obvious reason that it precludes the sort of risk-taking that supplies the rationale for such insurance.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

In a word: it should matter less than it seems to. CBDC is one solution to a variety of problems; but it is neither the only nor the best solution to any of them. That some countries have resorted to it should impress U.S. policymakers no more than many countries past and present reliance upon nationalized air carriers and telecommunications systems should impress them. The question our regulators should be asking isn't, "Should we do what China (for example) is doing?" but "Can we do better than China?" In the past, we did \_a lot\_ better than China by relying less on state-run enterprises and more on private enterprise than it did, and China, having learned from us, has since had to catch up. I'm pretty sure that we can now do better than China (and some others that have gone or are likely to go the same route), and better than we can do with our own CBDC, by tapping the full potential of PMDC's.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

There is no reason why it should be. But there is also no reason why it shouldn't, given that Federal Reserve notes enjoy the privilege: it can hardly matter much in practice. Of course no PMDC should be given legal tender status.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Discussed above. A difficult problem. All things considered, if there is to be a CBDC, I hope it will not pay interest., for that is a Pandora's box best left unopened!

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

If it bears interest, or might become interest-bearing in the future, definitely (see above).

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

First, a side comment: as used in the discussion paper, the term "intermediary" is misleading, for the firms in question are more like custodians. They do not borrow from the public to re-lend to the Fed, by holding balances with it, as true intermediaries might. Rather, the Fed issues its own liabilities to the public, through agents that manage the public's holdings on both the public's and the Fed's behalf. A truly "intermediated" CBDC might be a PMDC fully-invested in wholesale CB digital balances. Because their role is more one of custodians than one of true intermediaries, I do not think it quite so important what sort of firms take part in supplying what the Fed calls "Intermediated" CBDC. The main concern should be their ability to serve retail customers effectively and efficiently.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

An offline DC, whether CB or PM or both, is highly desirable.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Privacy risk is mentioned but insufficiently considered. The flagship CBDC under development right now is China's digital yuan, whose entire purpose is to eliminate every vestige of financial privacy in China's increasingly totalitarian, panopticon regime. It is fatuous to pretend that a digital dollar is anything other than an attempt to "keep up with the Chinese." But there is absolutely no reason for this; China also has highly efficient cell-phone based payment systems, like Alipay and WeChat, that in some respects are more efficient than American check-writing and debit cards -- but again, these have zero privacy features, and are constantly exploited by the Chinese government to monitor and control people's private lives. Such measures may be consistent with China's long tradition of absolutism, but are utterly incompatible with the American system. Our system may be a bit "messier," but freedom always is, in contrast to the ruthless efficiency of centralized control. And a CBDC, no matter the professed good intentions, will end up diminishing American financial privacy, if not, in the longer run, negating it altogether in the name of competing with China. Also note that the emphasis on need for smoother, more streamlined cross-border movement of currency will also facilitate the creation of some kind of global currency -- another monumentally bad idea.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

The current system has proven more than adequate. In particular, the strength of the dollar resides less in the speed of its convertibility than on its underlying stability and on international confidence in its long-term reliability. These are ultimately fiscal and monetary considerations, not questions of exchange mechanisms.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

How could a CBDC fail to be extremely inflationary? It would require, in effect, the at-will availability of Fed funding for extension of credit by commercial banks and other intermediaries, i.e., in direct response to consumer demand for money (and in much greater quantities, of course, than consumer demand for old-fashioned cash). It might have an effect similar to, e.g., the Fed directly negotiating with the Treasury to purchase newly-issued debt, instead of buying and selling already-existing securities via traditional open market operations. Has anyone even considered the monetary moral hazard and inflationary pressure that retail CBDCs might entail?

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

See answer to question 4. My best guess is that it would incentivize much sharper rates of inflation, in reaction to the unquestionable demand for such a convenient new form of money, especially where any retail CBDC is concerned.

6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?

See answers to 4 and 5.

7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?

Any safeguards designed to limit the inflationary risks of such an instrument would probably also diminish its efficiency and, hence, its attractiveness to consumers. Consumers love easy money in any form, moral hazards and all -- but that does not mean it is good policy in the long range.

8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?

Yes. Absent hyperinflation, cash (like precious metal and other "old-fashioned" transactional mediums) will always have features that will make it attractive to consumers, privacy being one of them.

9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?

Impossible to say, but the clear implication in the paper is that we need to keep up with the likes of China or risk having the dollar's status as the world's reserve currency eroded. However, the status of the dollar is less dependent on efficiency in narrow, technological terms than upon underlying confidence in the long-term strength and viability of the U.S. economy. Some may initially choose the digital yuan for its efficiency, just as many countries bought into the "One Belt, One Road" initiative -- only to find out that doing business with China was altogether different than doing business with the West. In similar fashion, the digital yuan will allow the Chinese government to track financial data all over the world, including any other CBDCs linked to the yuan. That alone should be a basis for staying out of any international CBDC system, and advising other countries to do the same. And if cross-border payments retain some of their present inefficiencies, then so be it.

10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?

See answer to question 9. Bottom line: an international CBDC system such as both this report and the recent BIS report contemplate would amount to yet another foolish codependency with China, and one the Chinese will be only too happy to exploit.

11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?

A better question would be: Are there additional risks not raised in this paper? See responses to preceding questions on the systemic dangers posed by China's digital yuan.

12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?

It would be impossible. Significant concessions in the area of personal financial privacy would be unavoidable, even if, contra the Chinese, the goal of an American CBDC would be to enhance convenience while safeguarding privacy.

13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?

14. Should a CBDC be legal tender?

Emphatically not. At most, it should be a voluntary market alternative that consumers are free to reject in favor of other forms of payment. Otherwise, whatever privacy compromises end up being baked into CBDC design features will be forced on people, since everyone, and every bank account, will then need to be forced to accept CBDC payment, with everything that goes with it.

15. Should a CBDC pay interest? If so, why and how? If not, why not?

No, if its goal is truly to be nothing more than a digital equivalent to Federal Reserve notes. Also, interest accrual would be still more potentially inflationary than retail CBDCs themselves.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

In theory, this would be a necessary expedient to cap the supply of CBDCs in the overall money supply (would CBDCs be reckoned as M1? We assume so.). But actually keeping track of such numbers would be well-nigh impossible, as well as impractical. How, for example, could a cap be imposed in the issuance of a large commercial loan, as to what percentage of the loan could be extended in CBDCs?

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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**1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?**

Using a balance of financial institutions reserves held with and backed by the Fed for digital fiat currency (effectively bank issued stablecoins), these FIs can be authorized to be able to issue and circulate the digital currency between each other and their customers. The end customer new digital currency accounts would ideally also be FDIC backed. This could be an alternative for a retail circulation of funds with comparable credit and liquidity considerations to how it was described in the paper for Fed direct issued CBDC and corresponding accounts with them. A CBDC exclusively for wholesale bank to bank settlement could also be used to facilitate interbank settlement for when the retail bank issued digital fiat currency is taken out of circulation for exchange back to "legacy" deposit funds or cash to the retail customer when the retail digital currency was issued by another FI. This same wholesale CBDC could also be integrated as an optional settlement method for other existing payment rail settlement for what these rails can continue to provide clearing data services.

**2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?**

The Fed could be the oversight body for the retail level bank issued stablecoins in a manner similar to the relationship and oversight the Fed has for existing bank accounts. Another oversight option could be where the fed is just an active facilitator and collaborator in a bank issued stablecoin network similar to the role they play in the Business Payment Coalition Exchange Framework Oversight Committee.

**3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?**

Financial inclusion could be achieved where the bank issued stablecoins could be interoperable with new types of accounts which have lower or even no KYC requirements, but which have limitations in terms of maximum individual and/or cumulative transaction and account balance limits. These new accounts could be either bank or non-bank issued where non-bank issued accounts would need to be through MSBs as they are today as they reach and serve the unbanked and underserved. These non-bank entities would not be stablecoin issuers in this ecosystem design, but could be distributors of the bank issued stablecoins and/or CBDC. These types of account could also be used in conjunction with offline use of these digital fiat funds, where the offline transactions could optionally be totally anonymous or at least pseudo-anonymous. All online transactions should also be pseudo-anonymous and follow BSA and AML regulations. The limitations of the anonymous (or lower KYC) accounts could be kept within AML limits.

**4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?**

**5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?**

**6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial**

*sector differently from stablecoins or other nonbank money?*

Since a CBDC would be safer and more attractive than current private non-bank stablecoins and other non-bank money, it would have a much larger impact on financial institutions which could loose deposits needed to enable them to continue to have funds for loans. This would then create a need for loan seekers to seek alternative and potentially unregulated lending services. If these FIs were able to have digital accounts that the CBDC and/or bank issued stablecoins could circulate through where partial reserves could be used for lending as it is today, then this would be a better solution.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

The tools to consider include structure and software to enable and control new types of lower or no KYC accounts with limits within AML triggers. Another set of tools would be software that supports offline distribution, use, and conversion back to online versions of shadow copies of all offline tokens that sync with their online issued copies after either device they were transacted offline connects to the internet. A library of open source development tools/APIs to enable all sorts of functions around the issuance, distribution, use, redemption, account management, and use case specific functions would also be helpful as well.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes, but with similar limits such as those for ATM withdrawals to the lower or no KYC accounts which could serve as a cash equivalent alternative.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

The continued adoption of faster payment solutions in the US along with efforts to enable these to be interoperable for cross border transactions can bridge the gap until when and if a CBDC or a bank issued stablecoin network with oversight by the Fed, or Fed participating overnight body, can evolve starting with how the digital fiat could be an optional method of settlement to the clearing methods on these faster payment rails.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

As the paper pointed out, there is concern about some of these other CBDC efforts, such as by China, will affect the US dollar's prevalence as accepted currency outside of the USA. We do not want to wait and see to the point of being too late to loose some or all of this strength of the US Dollar which could affect US cross border commerce. The US should continue its efforts to at least be ready, willing, and able to move ahead once all requirements, policies, and testing can be done. It should avoid saying that it no longer sees a need and benefits to continuing this pursuit, which would have others take more of a center stage which could have adverse affects that were already pointed out about the adoption of alternative to a US CBDC or a central bank overseen network of bank issued stablecoins.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

All transaction detailed data, including personal and confidential data, need not be stored in the CBDC ecosystem other than a pseudonymous id that FIs that onboard customer accounts that hold CBDC funds. The FIs in turn record the applicable separate KYC information in their systems and are only accessible to them and the end customers this data belong to plus to the transacting parties and their FIs where only the necessary information for the receiving party to verify the sending party is needed. As described in other responses to this RFC, some of the end user accounts could have lower or no KYC when the account has applicable limitations to its use. There would still be a pseudonymous id at least tied to a government issued identification for less limited account usage, and perhaps just a biometric hashed id of an anonymous account owner where that biometric id could not be associated to the identity of the account owner, but could at least be used to control access to use of the account.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What*

*operational or cyber risks might be unavoidable?*

One of the key features should be that each CBDC token can be verified as one that originated in its ecosystem which has controls over the parties that can issue and hold reserves, distribute, and/or record transactions in the ecosystem on behalf of their customers. The access methods and controls for these operators needs to be as secure as possible to prevent cyber attack and the requirements for access to the operator's systems needs to be just as secure to prevent attack from within one or more of the operators. All transactions should be credit push and not debit pull as is the case for the real time rails of TCH and FedNow. These things do not preclude fraud at the end user level to address account takeover, synthetic identity, and some of the other types of fraud that we continue to see and as classified in the Fed's fraud classifier. The CBDC ecosystem design could also include a means of fraud information sharing across FIs, including blacklisted or suspicious accounts and party identities. It could also provide a means of detecting AML across multiple FI accounts linked to the same party ids. The ecosystem design could also include additional means of identity registration and verification of onboarded end customer payers and payees that funds are being transacted to. Some key directory functionality could be provided along the lines of some of the characteristics as described in the white paper from the Directory Models Work Group of the US Faster Payments council.

**14. Should a CBDC be legal tender?**

What difference would this really make as long as it would be "good funds" and eventually available to all (i.e. ubiquitous)?

**15. Should a CBDC pay interest? If so, why and how? If not, why not?**

No in the case of where the account were one held directly with the Fed, which I disagree with. For intermediated accounts, especially per the bank issued stablecoin approach, these accounts should be eligible to earn interest comparable to interest available with checking accounts. Other forms of economic incentives could be provided as well by intermediaries similar to incentives for debit and credit card usage when they process transactions through the CBDC ecosystem that they are permissioned operators for.

**16. Should the amount of CBDC held by a single end-user be subject to quantity limits?**

Only in conjunction with lower or no KYC accounts as described above. Cross border transactions and accounts holding US CBDC that may be in other countries may need to have applicable limits as well. The total CBDC (or bank issued stablecoins) in circulation should be limited along the same criteria of the total of printed paper and minted coins.

**17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?**

There could be multiple levels of intermediaries in the CBDC ecosystem, much like there is today, where only those that are currently eligible for having accounts and reserves with the Fed should be the top level. Then smaller FIs and Fintechs of these top level or Fintechs of the lower level FIs could be nested sub-accounts where access to the CBDC does not dis-intermediate the FIs that have the ultimate compliance, including security controls over access to these sub-accounts in the ecosystem which serves as a "book of record" that effectively enables a distributed open banking capability in conjunction with the CBDC ecosystem design. In Vments FedNow RFC response, there is additional detail provided in the sub-account design along with other design specifics relative to the ecosystem involving bank issued stablecoins.

**18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?**

Absolutely for a number of reasons, including if and when the lights go out as well as for where internet access may be limited, which can be more prevalent for those that are unbanked and underserved. A design that can support this is one where each CBDC token online includes an optional offline device id that it was downloaded to where it could be transacted offline and then synced when either party of the transaction connects online. There are many other details about the specific of this offline design and issues that it needs to address which can be provided upon request and are too long to include in this RFC, but which were included in Vments FedNow RFC response.

**19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?**

This needs to be an absolute requirement to foster adoption. The use of digital wallets, QR codes, biometrics, and directories using aliases, can all contribute to ease of use and acceptance. The offline capability at point of sale should also be considered here, where at least the merchant can be online to real time validate the offline tokens it accepts, or its device can at least check for CBDC token watermark type validation plus transacting party validation against a downloaded blacklist of bad actors, including those that had attempted to backup, restore, and reuse already used offline CBDC tokens.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

The CBDC tokens could be integrated as an optional means of settlement in existing payment rails where these rails at least continue to serve as clearing for the transaction data optionally real time settled using the CBDC (or bank issued stablecoin equivalent).

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

The sub-accounts design described above could be provided through a distributed ledger as the “book of record” for the minimal transaction information that can be stored and accessible to the participating permissioned operating parties where the information is pseudonymous and have just enough to be able to effectively enable a peer to peer transaction between operators that then transparently facilitate the same through their sub-account intermediaries and in turn to end customer user experiences. The intermediary operators would also have cloud and/or on-premise servers that interface and hence reconcile to the distributed “book of record”, where these servers can include the data necessary for the operator’s compliance with all applicable regulations for being such financial services. An addition and very unique design consideration is where the CBDC tokens (or bank issued stablecoins) could be issued into a line of credit account where this affects the reserve requirements versus when these same tokens are issued into a “cash” account. Then as the line of credit tokens are used, they become cash to the receiver and part of the balance due the lender, who in turn needs to adjust their reserves accordingly. Smart transactions is another design concept where the cloud and/or on-premise servers described above can record detailed transaction data not shared in the distributed ledger other than for hash control totals to be able to help validate that this off distributed ledger data has not changed and is effectively immutable as well as is the distributed ledger data. This requires applicable blockchain functionality for security and protection over any of the data being modified versus incrementally adjusted through new transaction data. All of the features described within this RFC are included in Vments ecosystem design which I would be happy to share with those interested to learn more about. In my response to the original FedNow RFC, I had included several details about the specific design of the digital fiat token, tiered sub-accounts, smart transactions, and more.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Updated May 13 2022 CBDC access technology risk. Additional regulated controls for CBDC digital access technology may be necessary for settlements to and from private money and non-bank money to protect Central Bank money and Commercial Bank money. Unregulated digital technology for purchase and redemption of CBDC could create the means for episodes of unfriendly coordinated destabilizing reverse runs and conventional runs on Commercial Bank money to and from Central Bank money, causing potential for harm to the operation and function of Commercial Banks, M1 money and local economies. It is intended that Central Bank money stock includes CBDC which, like physical fednotes, are liabilities of the sovereign central bank and legal tender. By extension of generally accepted accounting principles such liabilities are digital assets in possession of holders with 'unequivocal certain' claim rights on the sovereign government. These claim rights are calibrated in the sovereign unit and shall be accepted when offered in economic episodes as a grant of consideration to account for payment of debts, settled immediately and on account. If possession of the stock of CBDC claim rights is to seamlessly transfer and exchange in local economic episodes between the stock of CBDC and Commercial Bank money at par and vice versa, then Commercial Bank money stock may become by extension, similar to expressions of safe, stable and unequivocally certain CBDC claim rights. Federal Deposit insurance gives more of such certainty, while those households and businesses in economic episodes retain accountability for knowing who they are dealing with. An ecosystem of laws supporting the clearing, possession and holdings of Commercial Bank money claim rights has evolved over time. Such Commercial Bank claim rights interchangeably support the operation of a safe, stable and certain sovereign money ecosystem in economic episodes. If settled ultimately or backed by Central Bank money and Commercial Bank money, it follows that private money and non-bank money digital assets offered as consideration by one counterparty in economic episodes in private markets and marketplaces, may by extension become an expression of the safe, stable unequivocally certain stock of M1 money claim rights. It is not hard to imagine that CBDC and Commercial Bank money accepted without regulated digital technology access controls may be used instantaneously and perhaps in parallel to settle immediate purchases and redemptions of private money and non-bank money. Private digital assets calibrated in the 'dollar', the sovereign unit, may become functionally like and also fungible with CBDC and Commercial Bank money inside and outside sovereign money ecosystems without regulated digital access controls. Private money enabled by Central Bank and Commercial Bank money may become like Central Bank and Commercial Bank money. M1 money stock digital access technology without access controls could potentially harm Commercial Banks if access technology is used as a means for unfriendly coordinated movements of CBDC and Commercial Bank money. Existing limits and other regulated controls like Anti Money Laundering programs may be insufficient to control CBDC access technology risk. Uncontrolled digital access technology means (mediums and methods used) when joined together with unfriendly intentions and coordinated movements of CBDC and Commercial Bank money, create the potential for harm.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

All of the potential benefits of a CBDC can be better achieved by thinking differently now about the operation of money and payments in economic episodes. A brief discussion of the forms of money and the limitations of barter exchange and related coincidence of wants and work tradeoffs, reveals opportunities for updating the concepts of money and payments, thus

returning intrinsic value to Central Bank money through financial inclusion. A rich vein overlooked for renewal of the current day operation of money and payments in economic episodes, exists in the examination of limitations of barter exchange in economic episodes. New thinking about Central Bank money clearing reserves and new supporting Commercial Bank retail banking products and advisory solutions will be required for optimal CBDC design. Money stock and its representations existed in transactions and relationships before Central Bank money. For example, money existed as counterparty account positions marked up in ancient trading ledgers, and as physical commodity reserves wanted in economic episodes and considered 'ready money' with intrinsic value. Sovereign authorized fiat money in the form of gold and silver coins with intrinsic value were calibrated and circulated by sovereign nations. After the gold standard backing sovereign fiat money was finally abandoned in the 1970's, US Federal Reserve notes and coins lost any remaining intrinsic value in and of themselves, leaving extrinsic value perceived by holders and those who want to hold US Central Bank money stock. With the removal of any physical limitation to intrinsic value derived from the quantity of fiat money metals exchanged or backing sovereign note liabilities, since then the variation in value of Central Bank money stock, Commercial Bank money stock and private money stock, has fluctuated based on at least the performance of sovereign economies and the quantity of money stock held and circulated. Of course in any economy, even in commodity based barter exchange economies, households and businesses need each other to satisfy individual wants and tradeoff consideration for goods and services, beyond what they otherwise could have or do on their own. We get by joining with each other to achieve what we cannot otherwise give or take or claim or want to do ourselves. In a coincidence of wants, and apart from the simple physical exchange of goods and services, counterparties join ready money stock and tradeoff costs of consideration in episodes of barter exchange, mitigating frictions and uncertainty for advantage and satisfaction. Current money or "currency" is the joining of "ready money" stock and tradeoff of consideration mitigating frictions and uncertainty in economic episodes. The previous understanding of barter exchanges, and the limited opportunity for scalable, repeatable economic activity, diversity, leverage and growth in barter exchange episodes having a necessary coincidence of wants for physical exchanges, was thought to be solved by the introduction of sovereign fiat money gold and silver coins and later legal tender money liabilities of sovereign nations. Possession of these circulating fiat money stock things, objects or mediums with marketable intrinsic value or certain unequivocal cash claim rights on sovereign nations, has the effect of separating time and place for the right people, with the right goods, to come together for advantage and satisfaction. Instead possession of money mediums has the effect of extending satisfaction and wanted advantages into the future, resolving current episodic frictions and uncertainties from a necessary coincidence of wants and efforts in barter. There is another side of extending satisfaction and wanted advantages by possessing fiat money stock freely at will into the future. The disaggregation and separation of immediate cooperation by households and businesses in economic episodes is lost. A coincidence of wants and tradeoff of work efforts previously necessary to mitigate each other's current economic frictions and uncertainties and achieve different advantage and satisfaction in barter exchange episodes, is lost and may no longer be required for advantage and satisfaction in a sovereign economy with sovereign fiat money. Instead, to achieve different advantages and satisfaction, a dependence is created on the sovereign nation for an adequate supply and fair distribution of circulating sovereign fiat money cash claim rights and on money mediums and things with marketable value calibrated by the sovereign nation. The possession of intrinsic value of metal coins and circulating fiat money legal tender cash claim rights, each releases and obviates the need for a necessary coincidence of wants and work efforts of households and businesses in economic episodes found in barter exchange.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

With these historical effects it is no coincidence that some of the benefits of a possible CBDC respond to the corresponding loss of intrinsic value, and loss of episodic cooperation for financial inclusion of sovereign fiat money ecosystems. An earlier submission by your writer to the call for feedback by the Bank of England reviews a concept of "Rhombus Money" which is a very preliminary attempt to consider new retail Commercial Bank account with the support of Central Bank helicopter grant money. I remain available to take a deeper dive with others into all of these high level and preliminary ideas.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?
7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?
8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?
9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?
10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?
11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?
12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?
13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?
14. Should a CBDC be legal tender?
15. Should a CBDC pay interest? If so, why and how? If not, why not?
16. Should the amount of CBDC held by a single end-user be subject to quantity limits?
17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?
18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?
19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?
20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?
21. How might future technological innovations affect design and policy choices related to CBDC?
22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The development of CBDC represents a generational opportunity to expand the central bank ledger to additional users, enabling important structural changes and accelerating innovation without disrupting existing payment rails. In designing a CBDC, the Federal Reserve should also consider the following opportunities: Elimination of depository risk When CBDC is issued by and is a direct liability of the Central Bank, citizens holding CBDC no longer have depository risk to a commercial bank. Through a multi-party technology framework and practical operating structure, CBDC would enhance the ability of central banks, commercial banks, and technology innovators to work together using timely, accurate, and auditable information from a Central Bank-governed system of record of CBDC positions. A more resilient and inclusive system For finance and commerce: In terms of operational resiliency, as CBDC use becomes widespread in financial markets, atomic swaps and instant settlement can minimize the current lack of seamless interconnectedness between firms. CBDC could function as a safety net during a stress scenario, mitigating counterparty risk and reducing the domino effects seen in the 2007- 2008 financial crisis. Additionally, through shortened payment chains and accelerated transfers/settlement, true Delivery vs. Payment (DvP) transactions are enabled without having to rely on a trusted third party. For individuals: The extension of the Federal Reserve's ledger to under- or un-banked consumers would provide easier access to financial services at lower cost, enable more efficient distribution of benefits administration, and support continued innovation. Free from the competitive pressures inherent to commercial institutions, the Federal Reserve could use CBDC to serve the public good while prioritizing central bank policy objectives. Furthermore, the Federal Reserve would gain greater insight into the real-time impact of monetary policy decisions on the macro-economy and the ability to calibrate policy more nimbly. Enhanced monetary policy tools CBDC would enhance the Federal Reserve's ability to manage reserves and oversee monetary policy. For example, benefits administration could be streamlined with programmable money, providing citizens with greater convenience and certainty of receipt. Examples include extraordinary government payments such as controlled stimulus payments, as the CBDC framework should be flexible and nimble enough to support unanticipated use cases. The Federal Reserve would also gain greater insight into the real-time impact of monetary policy decisions on the macro-economy, with the ability to calibrate policy more nimbly. Safeguarding and strengthening the dollar as the world's reserve currency The U.S. should take a leading role in establishing a CBDC aligned to the world's reserve currency. The absence of a U.S. CBDC creates a vacuum that would be exploited by other governments or stablecoins. As faster, cheaper digital payments and expedited settlement evolve, favoring digital currencies, a currency substitution scenario could arise where another nation's CBDC would rise to prominence, replacing the U.S. dollar in international trade. Depending on which CBDC rises to prominence, at a minimum international payments could be subject to uncertainty given geopolitical or financial stability risks or, in worst case scenarios, allow for the currency to be used by bad actors or to be weaponized as another tool to achieve political goals. Finally, the Federal Reserve will want to be certain that any CBDC is scalable, secure and meets rigorous performance standards. This includes being able to cope with ever-increasing transaction volume without any upper limit on the number of possible transactions; providing stability and reliability to maintain confidence and smooth market and payment operations; adapting to unforeseen circumstances or requirements; and supporting emerging use cases.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

There has been significant discussion about the relative merits of using stablecoins or CBDC. While digital assets such as stablecoins and tokens have proven their worth for digitized objects and securities, particularly for cross-border payments, we believe CBDC delivers significant technological, legal, accounting, and operational benefits for the Federal Reserve and across the financial ecosystem. **RISK MANAGEMENT** Liquidity and credit: CBDC can reduce liquidity and credit risk since central bank money could provide finality in the payments process or in settlement. This functionality is not inherent in the design of stablecoin.

**Currency fragmentation:** A Federal Reserve-issued CBDC would be a digital version of the U.S. dollar, the world's reserve currency. As a government sponsored digital currency, it would remove the potential for fragmentation inherent in the creation of multiple privately-issued stablecoins, which not only might compete with one another but are also subject to inherent commercial pressures unsuited to a national currency. **Depository risk:** A Federal Reserve-issued CBDC would be a liability of the central bank, removing depositor exposure to a commercial bank. This cannot be achieved with stablecoins. **STABILITY** Finality of payment: CBDC allows for atomic transactions on use cases without counterparty risk (DvP) and enables cross-border P2Ps without 3rd parties. There are initiatives, such as the Regulated Liability Network, that could allow central bank money to interact in the payments process of commercial banks and other regulated financial institutions to reduce risk.

**Financial stability:** A Federal Reserve-issued CBDC can be used for benchmarking, underpinning interbank payment systems and serving as the world's reserve currency. A marketplace of multiple privately-issued stablecoins can and should not take the place of a central bank issued currency. If one stablecoin were to rise to prominence, it would threaten the primacy of the U.S. dollar/digital currency and undercut U.S. monetary policy. **GROWTH AND INCLUSION:** Through CBDC, the extension of the Federal Reserve's ledger to under- or un-banked consumers would provide easier access to financial services at lower cost, enable benefits to be distributed more efficiently, and support continued innovation free from competitive pressures. In contrast, the for-profit drivers of private money mean that financial inclusion is not a priority. **PRIVACY/PROTECTIONS:** A CBDC built on smart contracts embeds rights and permissions, limits data to stakeholders, and enables an observer role to facilitate oversight. Privacy safeguards are embedded as the CBDC is established and can be updated over time as needed. In contrast, privacy standards on most blockchains are underdeveloped and leak information about transactions and individuals. Stablecoins suffer from an effective lack of privacy. Since all participants in the stablecoin network can inspect the history of transactions, data segregation is not achievable and only pseudo-anonymity can be achieved. This is not sufficient for a national digital currency. Stablecoins would benefit from regulatory clarity, and the U.S. President's Working Group has recommended that stablecoin promoters be regulated in ways similar to those for deposit-taking institutions or a money market fund. Until such actions are taken, in and across jurisdictions, stablecoins and cryptocurrencies will exist outside and apart from the main, regulated financial world of central bank currency, commercial bank money, and CBDC. Aside from speculation, the uses for crypto and stablecoins in the broader economy will be limited. The key arguments against stablecoins are fragmentation and risk. Issued by non-governmental institutions, there is an inherent risk that stablecoins will proliferate, creating competing financial instruments that dilute the value of a central currency and enabling misalignment between commercial incentives and public policy. We believe that the Federal Reserve should be concerned about reliance on non-governmental institutions: the creation and management of stablecoins by private institutions creates potential for currency and infrastructure to be controlled by entities whose motives and interests may not be aligned with government policy. In short, government policy cannot be assured by private actors. Currency, and the infrastructure that supports it, is too important to be managed by shadow central bank(s). For example, a foreign issuer of U.S. dollar stablecoins (whether a company or foreign government agency) could be beyond the reach of our regulators and could fragment and disrupt financial system stability. An official U.S. CBDC eliminates that risk while still allowing other digital assets such as stablecoins and digital tokens to play a critical role in payments and capital markets.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

In our opinion, a CBDC would be a significant driver towards achieving financial inclusion. It would permit the Federal Reserve to extend its ledger to a broader group of participants, including under- or un-banked consumers, giving them easier access to financial services and enabling them to participate in the real economy. As referenced by Darrell Duffie in his June 9, 2021 testimony before the U.S. Senate Committee on Banking, Housing and Urban Affairs Subcommittee on Economic Policy: A 2020 study by the Federal Deposit Insurance Corporation estimated that about 7.1 million U.S. households are unbanked. Many additional households are underbanked. Treasury Secretary Janet Yellen\* has stated that a digital dollar

could improve the access of unbanked Americans to basic payment services. Furthermore, a 2020 McKinsey study on the use of paper money in U.S. payments showed a decline from 51% (2010) to an estimated 28% (2020). If the acceptability of paper currency declines sufficiently, those without access to electronic payments would be further isolated from parts of the economy. CBDC would put a premium on ease of access and use without significant cost. This can improve the welfare of lower income households who might otherwise have weak access to the economy or suffer from extremely high payment fees. A CBDC: Would significantly improve payment efficiency, making the transfer of money - whether peer to peer, customer to business, business to business, across banks, and potentially internationally - more straightforward, faster and cheaper. Payments would involve fewer intermediate systems and profit-taking service providers along the payment path, and would be available instantly and around the clock. Remittances could lower fees on the world's poorest people. Could enable programmable money, which would streamline benefits administration such as controlled stimulus payments. The Federal Reserve could set benefit parameters and manage use while citizens gain greater convenience and certainty of receipt. We believe the Federal Reserve would be best able to invest in the necessary infrastructure to provide direct access to money, since it is not a profit-driven institution. Since the introduction of a CBDC could accelerate the decline in use of cash, we recommend that the Federal Reserve considers design with an eye towards maximizing flexibility to allow the currency to extend beyond the typical payment and banking scenarios of today to more equitably serve the un/underbanked. Liquidity, access and implementation considerations will be critical to this broader range of users, who may not have the technological or financial wherewithal to make investments in enabling systems. Open source, smart contract technology would make it faster and easier to create applications that could be widely accessible using mobile networks and devices, simplifying access for those underserved by traditional banking services. \* New York Times DealBook video interview, February 22, 2021 - "Too many Americans don't have access to easy payments systems and banking accounts, and I think this is something that a digital dollar, a central bank digital currency, could help with." Secretary Yellen.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Embedding policy goals in CBDC is possible through the use of smart contracts, which could facilitate: Direct lending to underserved communities. Prioritized investments in certain sectors of the economy (agriculture lending) or geographic zones (for an emergency response). Immediate availability of interest rate changes to ultimate beneficial owners, without the need for action on the part of financial intermediaries.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

We believe a CBDC issued by the Federal Reserve would serve as another instrument for implementing and managing U.S. monetary policy, playing the same role as existing U.S. currency in the U.S. and globally (in international finance and trade) while delivering significant additional safeguards: The elimination of commercial bank depository risk, since CBDC liability would only be of/with the Federal Reserve. Significant reduction in settlement risk through transaction atomicity, whereby all legs of a transaction must be successful for the entire transaction to complete. This certainty of instant settlement also minimizes counterparty risk. The ability to streamline benefits administration through programmable money, which provides citizens with greater convenience and certainty of receipt (e.g., controlled stimulus payments, extraordinary government payments). An additional fiscal policy lever, if CBDC is interest-bearing. Greater insight into the real-time impact of monetary policy decisions on the macro-economy and the ability to calibrate policy more nimbly. CBDC could also provide more transparency to holders, enabling them to determine whether and where to allow their money to be used for lending or leverage (e.g., for ESG initiatives or to avoid certain industries). Currently, this level of determination is not available to consumers who hold money in depository institutions, as those institutions can utilize deposited funds for onward business activities without consent from or disclosure to the owner of any individual deposit account. Programmable criteria creates opportunity for new, flexible and customizable uses of funds features, offered by banks or payment service providers. The potential exists, however, for the introduction of CBDC to adversely affect the commercial banks' balance sheets, limiting their ability to lend or extend credit and adversely affecting financial stability. That risk, and ways to mitigate it, must be carefully considered as part of CBDC implementation. The Federal Reserve will want to identify options to solve the underlying issue of money moving from deposits to CBDC or to mitigate the effect of that movement on the bank's balance sheet in order to preserve the ability of commercial banks to extend credit. Recent economic models that test deposit scenarios in Germany indicate that in a non-interest bearing CBDC environment with limits on individuals' holdings, the run risk is three percent. Various strategies have already been proposed (i.e., enabling banks to issue

bonds to raise high quality credit, substituting one type of bank funding (deposits) with CBDC (central bank funding)\*, or replacing deposit insurance schemes with credit extended to depository institutions for maintaining CBDC savings accounts). Undoubtedly, even more options will emerge during the CBDC exploration process. Ultimately, however, we believe CBDC will promote competition while leveraging the strengths of the two-tiered financial system. “On the equivalence of private and public money”, Brunnermeier and Niepelt, July 2019

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

We have addressed some key differences between CBDC and stablecoins/non-bank money in Question 2, including the privacy, fragmentation and commercial risks inherent to stablecoins. One of the main arguments often made in favor of stablecoins or regulated tokens (such as the proposed Regulated Liabilities Network or RLN) is that they keep intact the existing two-tiered banking system. The concern is that the introduction of a CBDC could destabilize existing depository institutions by allowing (or even incenting) customers to maintain CBDC balances at the Federal Reserve as opposed to holding balances at commercial banks. This could adversely affect the financing and lending abilities of depository institutions and remove incentives for innovation. We believe that the stability of the existing financial structure can be maintained while still reaping the benefits that only CBDC can offer, such as removing depository risk and expanding financial inclusion. Our view is that multiple systems can exist in parallel, each providing important benefits and playing a critical role in payments and capital markets. In fact, Digital Asset is an active partner in the Regulated Liabilities Network (RLN), having recently announced a partnership with SETL to create a regulated network for tokens. RLN effectively replicates the existing two-tiered banking system with the creation of a network that supports a common way to represent the liabilities of different regulated institutions. It is intended to capture and catalyze some of the promises of digital currency but replicates current rules, regulations and arrangements and leverages existing public-private sector arrangements. RLN has been significant in bringing the industry together to conceive of the digital form of money as a regulated liability and to the industry together to problem-solve and accelerate implementation. However, we believe that RLN is a use case for CBDC, not a substitute for a Federal Reserve issued CBDC, which would offer substantial additional benefits including the elimination of depository risk. Only CBDC provides the surety of a digital currency backed by the full faith and credit of the United States government and sustains the ability and obligation of the U.S. Treasury to set and manage the nation's monetary policy. The technology implementation of a CBDC should provide the Federal Reserve with flexibility in how to handle, delegate, or assign responsibilities to intermediaries. This preserves the financial payments two-tier system and ensures that U.S. banks continue to protect the privacy of their customers while monitoring payments for their legality. In the first tier, the Federal Reserve provides the system of record for all consumer accounts and positions. The Federal Reserve: remains the sole issuer and governs the system of record of CBDC positions. sets standards for the use of CBDC (such as interoperability requirements). could potentially be the regulator of the payment service providers, which could be commercial banks and authorized fintech firms, as is the case with China's e-CNY. In the second tier, the Federal Reserve delegates authority to banks and other payment service providers, allowing them to offer access and services to their customers, and to perform KYC, AML, and other regulatory requirements. These institutions act on behalf of their customers on the Federal Reserve's ledger for specific actions, as agreed with their customers. The ability to achieve this requires a technology with expressive and fine-grained permission delegations and privacy rules. With this enhanced two-tier financial system, the Federal Reserve gains substantially more granular and real-time data for managing and monitoring financial policy, while encouraging U.S. banks to create an enhanced, more competitive payments system. In an increasingly digital economy, CBDC offers significant flexibility while retaining all the positive attributes of the existing two-tiered banking structure. Banks would continue their essential role of knowing and delivering services to the end user (KYC, OFAC, etc.) as CBDC enhances the Federal Reserve's ability to manage reserves and oversee monetary policy.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

As noted in our response to Question 6, the technology implementation of a CBDC should provide the Federal Reserve Board with flexibility in how to handle, delegate, or assign responsibilities to intermediaries. This preserves the financial payments two-tier system and ensures that U.S. banks continue to protect the privacy of their customers while monitoring payments for their legality. In the first tier, the Federal Reserve Board provides the system of record for all consumer accounts and positions. The Federal Reserve: remains the sole issuer and governs the system of record of CBDC positions. sets standards for the use of CBDC

(such as interoperability requirements), could potentially be the regulator of the payment service providers, which could be commercial banks and authorized fintech firms, as is the case with China's e-CNY. In the second tier, the Federal Reserve Board delegates authority to banks and other payment service providers, allowing them to offer access and services to their customers, and to perform KYC, AML, and other regulatory requirements. These institutions act on behalf of their customers on the Federal Reserve's ledger for specific actions, as agreed with their customers. The ability to achieve this requires a technology with expressive and fine-grained permission delegations and privacy rules. With this enhanced two-tier financial system, the Federal Reserve gains substantially more granular and real-time data for managing and monitoring financial policy, while encouraging U.S. banks to create an enhanced, more competitive payments system. In an increasingly digital economy, CBDC offers significant flexibility while retaining all the positive attributes of the existing two-tiered banking structure. Banks would continue their essential role of knowing and delivering services to the end user (KYC, OFAC, etc.) as CBDC enhances the Federal Reserve's ability to manage reserves and oversee monetary policy.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Cash usage is already on the decline and likely to continue, as it has over decades as debit and credit cards and now payment apps increase in prominence. Despite the ability to more rapidly transfer money between institutions and individuals, cash is unlikely to disappear. Cash continues to have an important role, particularly when natural disasters cause a lack of power or connectivity, or when geopolitical conflicts require immediate access to money and liquidity. Nonetheless, the same concerns about fragmentation raised earlier apply here. When innovation in the payments space relies upon the U.S. dollar, new alternatives simply provide faster, easier and hopefully less costly ways to move money. If the underlying currencies start to shift to various stablecoins or tokens, however, you would likely see the rise of different payment structures from issuing institutions, each of whom would be seeking to maximize commercial benefit: whether that is providing exclusive services, limiting access to non-subscribers or looking to maintain dominance. This could result in creating new silos rather than breaking them down, increasing the likelihood that existing inclusion challenges are perpetuated. For example, it could become even more difficult for the un/underbanked to continue using the cash economy (e.g., if cash becomes less widely accepted). Furthermore, this fragmentation could compromise the Federal Reserve's ability to manage monetary policy by limiting oversight and ability to control the money supply since stablecoins would be created/issued and managed by the private sector.. From a technical perspective, regardless of how the relationship between CBDC and cash evolves, neither the technical design nor the functionality of CBDC built on smart contracts would be affected. Additional use cases could just be built onto the same multi-party application framework.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

The absence of a U.S. CBDC creates a vacuum that would be exploited by other governments/central banks, notably the People's Republic of China/People's Bank of China which has already launched a pilot digital Yuan. The imperative towards faster, cheaper digital payments and expedited settlement would favor digital currencies, ultimately creating the scenario whereby currency substitution will occur and another nation's CBDC would rise to prominence, replacing the U.S. dollar in international trade. Without a national digital currency, the U.S. economy would be unable to access international digital payment rails. Furthermore, depending on which CBDC rises to prominence, at a minimum international payments could be subject to uncertainty given geopolitical or financial stability risks or, in worst case scenarios, allow for the currency to be used by bad actors or to be weaponized as another tool to achieve political goals. Domestically, a well-designed digital currency issued by the Federal Reserve can be authenticated and tracked, rely on smart contracts to verify transactions, and utilize complex business logic to address different financial activities. This could reduce reliance on third parties to create additional efficiencies throughout the transaction chain. Without a Federal Reserve issued CBDC, however, the inevitable fragmentation that would result from multiple different stablecoins or tokens issued by non-government institutions could increase inefficiency with additional steps needed to monitor/reconcile different systems that don't natively interact. Competition and competitive pressures would be unlikely to reduce either friction in payment processes or the high fees currently imposed on consumers or merchants.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The use of the U.S. dollar in international trade and as the world's reserve currency brings

substantial benefits to financing our country while benefiting U.S. companies and citizens. Whether cash or CBDC, currency is vital to national security. Therefore, we believe that the U.S. should take a leading role in establishing a CBDC aligned to the world's reserve currency. As noted in our response to question 9, the absence of a U.S. CBDC creates a vacuum that would be exploited by other governments/central banks, notably the People's Republic of China/People's Bank of China which has already launched a pilot digital Yuan. The imperative towards faster, cheaper digital payments and expedited settlement would favor digital currencies, ultimately creating the scenario whereby currency substitution will occur and another nation's CBDC would rise to prominence, replacing the U.S. dollar in international trade. Depending on which CBDC rises to prominence, at a minimum international payments could be subject to uncertainty given geopolitical or financial stability risks or, in worst case scenarios, allow for the currency to be used by bad actors or to be weaponized as another tool to achieve political goals. As noted by Darrell Duffie in his June 9, 2021 testimony before the U.S. Senate Committee on Banking, Housing and Urban Affairs Subcommittee on Economic Policy, the rise in cryptocurrencies should also be of concern. A Federal Reserve issued CBDC could provide an attractive and safe alternative to protect against infiltration by undesirable types of cryptocurrencies. Finally, the U.S. should take a prominent role in international discussions regarding technical standards for the design and appropriate uses of CBDC, including intergovernmental agreements for the cross-border use of CBDC, which are already starting at the G7 level. To effectively influence these developments, the U.S. will need to have the knowledge and credibility that comes from having developed CBDC.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Yes. We believe the most important component of a successful CBDC is a central bank ledger that provides a single golden source of data and the ability for permissioned participants in the CBDC ecosystem to view, access and act on those data. This requires a decentralized distributed ledger capable of: Clearly establishing rights and permissions of various actors, with a high degree of built-in privacy protections at a sub-transaction level. Permissioned banks and payment service providers can view only the essential data regarding their own customers or transactions to which they are a party. Accurate, synchronized, real-time data. This eliminates the current challenges of duplicated data and the need for constant reconciliations across separate records and systems of participants, which is a more energy efficient method of data storage that increases security. The ability to integrate with, and operate in, multiple different infrastructures whether that be existing payment rails or emerging ledger or blockchain platforms. An interoperable architecture would allow the different systems of the Federal Reserve, banks and other payment service providers to have a common, fully synchronized view of the current state of the Federal Reserve ledger while affording the ability to operate on different database and ledger choices. The ability to connect to existing solutions minimizes investment and encourages adoption. The flexibility to adapt to as-yet-unknown scenarios or use cases as technology continues to evolve.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

The balance between privacy and the ability to retain necessary oversight to prevent illicit financial activity is one of the key challenges for CBDC. This is where the chosen technology makes the difference. With a decentralized distributed ledger running a smart contract application framework, such as Digital Asset's Daml, you can clearly define how much privacy is required and requested and then create the smart contracts to embed and preserve those permissions. For example: The Federal Reserve would not centrally hold or monitor the personal identity of CBDC holders or detailed transaction data, which would remain decentralized at the level of payment service providers such as banks and fintech firms (as is currently the case in the two-tiered banking system). Individual users should not know the source and use of each CBDC. Parties to a transaction know only that step of the transaction, and transactions would not be visible to those involved in preceding or following transfers, except as desired and arranged. For example: When a consumer pays for something at a store, the merchant doesn't know where the money has been and the consumer doesn't know where it goes next. In a Delivery vs. Payment (an atomic, transactional exchange of money and securities), the central bank would not know for what reason the payment is executed, and the CSD/Registry would not know for how much money the security was sold, although both legs of the deal are processed in one single transaction. Ownership is known and can be closely controlled or restricted, enabling conformance with Know Your Customer (KYC), Anti-Money Laundering (AML), Countering the Financing of Terrorism (CFT) and other compliance requirements. The authority can control who can hold money at a programmatic level, for example to comply with restricted lists or to apply sanctions. The ability to audit and

track transactions, since data and contracts (to the lowest level of identification) are stored along with the history of each transaction. The set of observers of a Daml contract can be customized to allow for more transparency and visibility. Data minimization that enables the right to forget, enabling compliance with laws, regulations, and stringent standards such as General Data Protection Regulation (GDPR). Strong and resilient governance and security, with a ledger that is updated in real time, auditable, and supports supervisory oversight. A CBDC designed on a smart contract application framework creates a component approach to data governance, workflow, data modeling protocols and business interactions that prevents accidental data leakage, hacks and break-ins. Daml uses a declarative security model developed by cryptography experts. Transactions, data and contracts are stored along with transaction history in an authoritative ledger, ensuring a full, immutable record of CBDC throughout its lifecycle and providing permissioned observers with auditability and traceability.

A smart contract framework provides significant privacy benefits, embedded at foundational coding level, that are demonstrably better than the add-on privacy features commonly in place for crypto markets and tokens where the asset's entire history is attached in a way that is visible to every user. With Daml, privacy protocols can be built into the sub-transactional level of a contract, allowing for separate 'observer' roles that permit oversight without access to the user's personal data or private aspects of the transaction. Confidential information resides with its owner (regardless of whether blockchain or traditional databases are used), and rights and permissions are set at a granular level to protect the 'need to know' principle. This helps to limit the scope of data used, which minimizes the potential for data breaches or other exposures of personal information, while still allowing authorities to monitor the legality of transactions. In contrast, all non-Daml blockchains lack the basic properties of privacy, leaking transaction information to the world. Some chains have addressed some, but not all, of the privacy concerns; however, they lack the ability to guarantee their privacy mechanisms when transacting across chains. A CBDC solution should feature privacy within as well as across ledgers.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

The potential for operational and cyber risks is unavoidable but can be mitigated through infrastructure choices and the use of smart contracts and a decentralized distributed ledger. In terms of operational resiliency, as CBDC use becomes widespread in financial markets, atomic swaps and instant settlement can minimize the interconnectedness between firms which would mitigate counterparty risk and the domino effects seen in the 2008- 2009 financial crisis. CBDC can make the transfer of money more straightforward, faster and cheaper (whether peer to peer, customer to business, business to business, across banks, or internationally). Smart contracts are the necessary ingredient: they not only ensure that privacy controls are well implemented but also clearly define roles, rules and permissions for each workflow. Daml, in combination with Canton, perpetuates those controls and permissions even as access to CBDC extends across platforms, ledgers and legacy databases. This is crucial to providing finality of transactions via atomic swaps. With cross-ledger atomicity, if one leg of a transaction fails, all legs fail. By ensuring atomicity, systems can achieve payment-versus-payment and delivery-versus-payment without the risk of handing over goods when the payment leg fails, and removes the need for a central bank to act as an escrow. One way operational resilience can be achieved is to start with the infrastructure. For example, the design of Digital Asset's Canton ledger interoperability protocol (<https://docs.daml.com/canton/about.html>) ensures that as long as there is a single honest party to the transaction, any malicious actor or malfeasance is guaranteed to be unveiled. With regards to cyber resiliency, since CBDC creates a Federal Reserve ledger, the highest levels of security, data governance, and controls are essential. The ledger must be updated in real time, auditable, and support supervisory oversight. A CBDC designed on a smart contract application framework creates a component approach to data governance, workflow, data modeling protocols and business interactions that prevents accidental data leakage, hacks and break-ins. For example, Digital Asset uses a declarative security model developed by cryptography experts. Transactions, data and contracts are stored along with transaction history in an authoritative ledger, ensuring a full, immutable record of CBDC throughout its lifecycle and providing permissioned observers with auditability and traceability. While it is possible for the cryptographic key of a participant to be compromised, allowing the entity that has stolen the cryptographic key to act in the name of the aggrieved party, this would not be a challenge unique to CBDC. Industry standards exist to protect against this worst case scenario using Hardware Security Modules.

*14. Should a CBDC be legal tender?*

The specific parameters of CBDC will be set by the Federal Reserve. As a digitized form of money issued by the Federal Reserve, we expect that CBDC would be legal tender in order for it to be effectively used in trade and as a monetary policy lever.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

We would expect that CBDC could pay interest; however, that decision is up to the Federal Reserve Board and how the CBDC is designed to interact with the existing two-tiered banking system. As needs evolve, we believe it is critical that the technology underpinning the CBDC is agile and flexible enough to adjust to changing parameters. So, for example, if CBDC is not designed as interest bearing but then becomes so, the Federal Reserve would have another lever for monetary policy and could nimbly implement interest rate changes (positive or negative). Smart contracts enable this, as any change made to the core definitions is automatically federated throughout the application.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Any decision on limits should be made by the Federal Reserve as a matter of policy. However, similar to whether a CBDC is interest-bearing, the CBDC should be built on a technology that allows its rules and provisions to be changed as needs evolve and for those changes to be implemented rapidly throughout the entire system. Again, smart contracts simplify this process: limits could be set within the core permissions, and they would automatically federate throughout the application. In terms of how this could work: initial limits could be defined and changed over time as use of the CBDC increases across markets, is used in lending and liquidity, and interacts with existing services provided by banks and financial institutions. Should balance limits be imposed, a smart contract could instruct the conversion from digital to physical currency in a bank account or could govern how an account could be used. For example, a transaction could fail because the payee is exceeding its limits or because the payor does not have sufficient funds. In either instance, the smart contract could be set up such that: The excess or underage on a payment falls back on more traditional, non-digital payment mechanisms. The transaction is locked, giving the recipient time to create capacity within balance limits or the sender to move funds to cover a shortfall. Smart contracts simplify this by encoding the specific rights of ownership along with the rules and processes around those rights. The Federal Reserve will want to ensure that a rich data definition language exists that can describe both the records and the rights parties have according to these records. Clear data controls are also important, so that both parties must jointly agree on changes to ownership records or allow signatories to an erroneous contract to amend it.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

The technology implementation of a CBDC should provide the Federal Reserve with flexibility in how to handle, delegate, or assign responsibilities to intermediaries, while preserving the financial payments two-tier system that ensures that U.S. banks protect the privacy of their customers while monitoring payments for their legality. In the first tier, the Federal Reserve provides the system of record for all consumer accounts and positions. The Federal Reserve: remains the sole issuer and governs the system of record of CBDC positions. sets standards for the use of CBDC (such as interoperability requirements). could potentially be the regulator of the payment service providers, which could be commercial banks and authorized fintech firms, as is the case with China's e-CNY. In the second tier, the Federal Reserve delegates authority to banks and other payment service providers, allowing them to offer access and services to their customers, and to perform KYC, AML, and other regulatory requirements. These institutions act on behalf of their customers on the Federal Reserve's ledger for specific actions, as agreed with their customers. The ability to achieve this requires a technology with expressive and fine-grained permission delegations and privacy rules. With this enhanced two-tier financial system, the Federal Reserve gains substantially more granular and real-time data for managing and monitoring financial policy, while encouraging U.S. banks to create an enhanced, more competitive payments system. Again, we would stress the importance of creating a CBDC on an infrastructure that can adapt to evolving conditions. Given the rapid pace of change and innovation in financial markets, particularly with regards to consumer financial services, any CBDC must be underpinned by a technology that can interoperate with new solutions, extend to emerging applications and new providers, and preserve its core features (privacy, permissions) – lest it become obsolete. Parallel industry developments One use case that complements the creation of CBDC is the Regulated Liability Network (RLN) that has been proposed by a number of commercial banks and payment service providers in order to capture and catalyze some of the promises of digital currency today, using current rules, regulations and arrangements. This plan leverages existing public-private sector arrangements for regulated payment networks in place between central and commercial banks, but it improves on these arrangements to capture some of the key attributes of CBDC. As proposed by the team behind the initiative, the RLN could play a major role in de-risking and accelerating commercial bank payments. A concept paper

published by Citi\* demonstrates how RLN would connect the liabilities of all mainstream finance players involved in transactions. One of the most important elements of this plan is that it does not require new rules or functionality for any of the actors in the payment process. The legal certainty around the payment system and liabilities is maintained but the technology changes. With central banks, commercial banks, and payment processors all sharing a technology framework to conduct business, the time to finalize transactions and the risk factors involved in payments could be significantly minimized. The RLN effectively replicates the existing two-tiered banking system with the creation of a network that supports a common way to represent the liabilities of different regulated institutions: Commercial banks leverage their balance sheet to issue commercial bank money on the RLN. The digital representations of these funds are managed by the issuing entity, meaning the central bank manages its liabilities in central bank money and each commercial bank manages the commercial bank money they have issued. The different issuances of commercial bank money are fungible, making transfers between the banks straightforward. To achieve this, every business ledger would need to be updated: those of the originating bank, the central bank, the recipient bank, other central banks or potential intermediaries. If the different ledgers are interoperable, the updates can be linked and synchronized into one transaction. RLN has been significant in bringing the industry together to conceive of the digital form of money as a regulated liability and to the industry together to problem-solve and accelerate implementation. Digital Asset has joined forces with SETL to create a regulated network for tokens, which will be minted, burned and transferred in a coordinated single operation that achieves real-time settlement between the customers of any regulated institution. However, we believe that RLN is a use case for CBDC, not a substitute for a Federal Reserve issued CBDC, which would offer substantial additional benefits including the elimination of depository risk.

\*<https://www.citibank.com/tts/insights/articles/article191.html>

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Offline capabilities will be important to retail CBDC in order to ensure financial inclusion. CBDC payments will require connectivity although it may become possible to transfer money using a direct connection between devices. Since offline payments would require someone to provide credit (unlikely to be provided by the Federal Reserve), we believe that offline payments will be a service provided on top of CBDC. Private companies could create apps to manage offline transactions, with records synced up when the user is online again. Alternatively, secure hardware could be used to complete transactions and store the relevant data until connectivity is available to sync up with the ledger.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

The design of CBDC should emulate the capabilities of currency with regards to transferability, fungibility, and other uses. The ability to set permissions and embed rules in CBDC, including compliance and regulatory tests, could ease the operational burden for the provider by providing surety at point of sale. In general, however, the user experience—including use and acceptance at point of sale—would be services provided on top of CBDC. Similar to how payment services and technology are developed today (e.g., debit cards, digital payment apps, and payment terminals) these are likely to be developed by private companies.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Interoperability is critical to any CBDC in order to achieve transferability across multiple payment platforms. It allows the Federal Reserve, banks and other payment service providers to have a common, fully synchronized view of the current state of the Federal Reserve ledger. It also enables complex, multi-party workflows to take place across ledgers. This is not only a necessary condition for sustaining the global economy—from trade, to payments, to financial market activity—but is also the key to efficiency since it eliminates current challenges of duplicated data and constant reconciliations across separate records of participants. For domestic payments, the applications that are integrating into the CBDC ecosystem need not run on the Federal Reserve's own infrastructure, and should interoperate across commercial banks and payment providers. Therefore, infrastructure interoperability is needed to ensure that the CBDC solution is more than a like-for-like replacement of the existing payment system. Looking outside national borders, it is unlikely that different countries issuing CBDC will decide on the same infrastructure. Therefore, a U.S. CBDC should interoperate across different technical infrastructures in order to reap the benefits of frictionless FX transactions. We believe that seamless and built-in interoperability is the only way for CBDCs to reach their full potential. Digital Asset's Daml provides the four key elements required for true interoperability: Data privacy: A CBDC solution should feature privacy within as well as

across ledgers. This functionality, while native to Daml, is missing in almost all non-Daml blockchains. They lack the basic properties of privacy, leaking transaction information to the world. Some chains have addressed some of the privacy concerns but lack the ability to guarantee their privacy mechanisms when transacting across chains. Multi-ledger technology The ability to deploy and connect digital currency systems across disparate networks regardless of the underlying IT infrastructure. Top among the challenges is deciding which technology to use - distributed ledger technology (DLT), centralized database, or existing payment rails. Riding on the back of this issue is the requirement for compatibility with other CBDCs, since there will be no single master ledger and because some CBDCs may not use DLT. Ensuring that a CBDC is compatible with other CBDCs is a critical first step to preventing the CBDC from hitting a dead end in cross-border applications. Cross-ledger atomicity: If one leg of a transaction fails, all legs fail. By ensuring atomicity, systems can achieve payment versus payment and delivery versus payment without the risk of handing over goods when the payment leg fails and without the need for a depository institution or a central bank to act as an escrow. Composable extensibility: This property is the ability to dynamically add new applications and to connect to other networks easily, from existing infrastructures to the most sophisticated emerging ledger solutions. Without composable extensibility, institutions will likely reinvent the wheel when future technologies arise or when there is a need to deploy future use cases to the same infrastructure. Since it would be impossible to predetermine all potential uses for CBDC, it must be easy to build new applications or add connections to other networks in order to support the adoption and expansion of the CBDC. Importantly, new use cases must not require changes to the initial implementation, and future use cases must be tightly integrated to ensure frictionless transactions between parties. Daml is agnostic to ledgers and platforms, and extensibility is a fundamental characteristic. Each new application relies on the same core code, reducing rework and time-to-market while ensuring integrity, and all applications can be easily integrated with additional providers and data sources. We believe that Daml provides the necessary technology infrastructure to create and successfully manage CBDC, with the added benefit of minimal investment and upfront cost, the ability to extend and evolve the program over time, and the flexibility to set or revise standards as requirements change.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Any consideration of CBDC should place significant value on future-proofing to allow for the broadest possible set of uses and greatest flexibility to expand as opportunities arise. This includes looking downstream to equitable adoption, allowing users to choose how they interact with the CBDC and to avoid commitment to a particular technology. Since it is impossible to predetermine all potential uses for CBDC, the design of the currency should allow new uses to be created without requiring changes to the initial implementation. This makes composable extensibility critical to ensuring the ongoing effectiveness of the digital currency. Composable extensibility is the ability to dynamically add new applications and to connect to other networks easily. Without composable extensibility, companies will likely reinvent the wheel when future technologies arise or when there is a need to deploy future use cases to the same infrastructure.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

The design and implementation of CBDC will be essential to ensuring a safe, efficient digital currency that supports the Federal Reserve's ability to effectively manage monetary policy, assure the U.S. remains the world's reserve currency, and expand financial inclusion. The most important component of a successful CBDC is a central bank ledger that provides a single golden source of data and the ability for permissioned participants in the CBDC ecosystem to view, access and act on those data. This requires a decentralized distributed ledger with the following characteristics: Smart contracts that support multi-party workflows. A CBDC built on smart contracts embeds rights and permissions, limits data to stakeholders, and enables an 'observer' role to facilitate oversight. In addition to clearly defining roles, responsibilities and rules for each workflow, monetary policy objectives (such as directed lending or prioritized investments) can be encoded directly within CBDC. Embedded privacy and safeguards. The balance between privacy and necessary oversight to prevent illicit financial activity is one of the key challenges for CBDC. Using a decentralized distributed ledger running a smart contract application framework, you can clearly define how much privacy is required and requested and then create the smart contracts that embed and preserve those permissions. This enables ownership to be known while safeguarding the privacy of individual transaction data; comprehensive auditability and traceability; data minimization (including the right to be forgotten); a full, immutable record of CBDC throughout its lifecycle; and strong and resilient governance and security with a ledger that is updated in

real time and supports supervisory oversight. A CBDC designed on a smart contract application framework creates a component approach to data governance, workflow, data modeling protocols and business interactions that prevents accidental data leakage, hacks and break-ins. Accurate, synchronized, real-time data. This eliminates the current challenges of duplicated data and the need for constant reconciliations across separate records and systems of participants. This reduces operational cost and risk throughout the payment chain, enables a more energy efficient method of data storage, and increases security.

Interoperability, to allow integration with and operability across multiple different infrastructures. This enables CBDC to work with existing payment rails and established or emerging ledger or blockchain platforms. An interoperable architecture allows the different systems of the Federal Reserve, banks and other payment service providers to have a common, fully synchronized view of the current state of the Federal Reserve ledger while affording the ability to operate on different database and ledger choices. The ability to connect to existing solutions minimizes investment and encourages widespread adoption.

The ability to dynamically add new applications or connect to other networks with composable extensibility. Connectivity to existing infrastructures or to the most sophisticated emerging ledger solutions is critical to the success of a CBDC. Without composable extensibility, institutions will likely reinvent the wheel when future technologies arise or when there is a need to deploy future use cases to the same infrastructure. Since it would be impossible to predetermine all potential uses for CBDC, it must be easy to build new applications or add connections to other networks in order to support the adoption and expansion of the CBDC.

We would be pleased to work with the Federal Reserve to model various options in preparation for, or as part of, a pilot CBDC program. This complements our existing work with the Regulated Liability Network, which will bring some of the benefits of digitization to payments but cannot provide the security, flexibility and scope necessary for a CBDC. In parallel, we are developing a dedicated CBDC sandbox to provide a safe space for modeling the interactions that sit at the heart of CBDC. The ability to see CBDC in action and understand how the rights, permissions and workflows of a smart contract-driven CBDC would function is an important next step and will facilitate discovery for policymakers, business users and developers. While there are undoubtedly risks in introducing a digital currency, careful design and the right infrastructure can mitigate many of those challenges. There is also risk in inaction. We believe the United States should act expeditiously to design and pilot a CBDC so that decisions about implementation can be thoughtfully considered. This allows the U.S. to retain preeminence in international trade as the world's reserve currency and enables the U.S. to take a prominent role in international discussions regarding technical standards for the design and appropriate uses of CBDC, including intergovernmental agreements for cross-border use.

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*Name or Organization*

Filipe Alves Ferreira

*Industry*

Individual

*Country*

Portugal

*State*

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Filipe's answer : Thank you for your paper "Money and Payments : The U.S. Dollar in the Age of Digital Transformation". The launch of the US CBDC is a necessity in order to fulfill a gap that still exists in the adolescence of the Internet. I want to say that your general framework seems to me to be judicious but too limited in terms of the intended benefits in favor of people as human individuals, the first interveners and the only drivers of the Economy and the peaceful conjuncture. That's why I want to look forward to more content on the USA CBDC under development at the Board of Governors of the Federal Reserve System. I am essentially referring to the gaps that the draft of the CBDC of the United States of America allows to persist in a similar way to the CBDC of the digital Euro, of the digital Yuan and to a greater or lesser extent in other CBDCs:1. The US CBDC has to be the digital US\$ and the US\$ is the currency of the world. - How does the FED want to develop the vitality of the dollar? - How to use, and does your central bank design the currency whose legal tender serves the development of the World Economy? The digital US\$ should be designed to be the UUSS\$, the digital universocial dollar .2. The US CBDC has to address the issue of interest rate variability and introduce the example of a limited fixed rate as an economic stabilizer for the formation of investment decisions. - USA and the FED can decide that the interest rate is 2%/year/365 payable on a daily basis and progressive compress inflation; - USA and the FED may decide that this is sufficient for the formation and remuneration of savings based on the money data-valuation practice, which leads to remuneration based on capital gains and random multiplicative capacity . - USA and the FED with the CBDC now proposed UUSS\$ may require for its creation genesis the addition of the date-time to this FED money and the recordable name of the owner of this UUSS\$ digital object.3. USA and FED may (and have to do) agree protocols with W3C, Google-Alphabet and Author to license WUW The Webcash Universocial Web and T.O.M. The Time Owned Market.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Filipe's answer : The benefits that should be achieved with the launch of the US CBDC may be more important than those considered in your January 2022 paper and be specific to the Universocial US\$\$ of the FED, by introducing the notion of an automatic work on the data of the money to be created as 1 by 1 digital objects with unique characteristics and just shifting the asset from credit-debit balances to digital property asset registered at a sequential historic general ledger. The notion to be introduced and already tested is the processing of money in different parts of the body of the digital object.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Filipe's answer : Considering in the first place the possible launch of the US CBDC as a liability of the central bank and fearing multiple launches of similar CBDCs, I have the intuition of certain storms in the field of financial inclusion where the US dollar digital presupposed in your paper of January 2022, even if with unmistakable value support, it may lack the simple features that I see in the launch of USA FED's CBDC or Universocial US\$\$ giving it in a way linked to the value support: - as cash production cell (1st monetary part processable as personal savings growing advantage ) + - a counter @stamping of the time in production of the cell and its antiquity in the production of distributable wealth (2nd financial part processable as capital gain as the time go) Time Market Bid & Ask + - a webtaxmatic cloud function as a release value of the webcashmatic income of the new taxable amount that the US Treasury tanks (3rd part processable as "freedom" gain) + - a tagvaporator of the

personal orientation option for the free exercise of the owner of the digital object UUS\$\$ regarding the eventual limit destination (democratic folks control of investments) of the monetary load allocated in the "Universocial Sovereign Anchor" which production is distributed every 24 hours (4th part processable as "multiplicative capacity" gain).

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Filipe's answer :The launch of US CBDC designed as "...a digital liability of the Federal Reserve that is widely available to the general public" could affect the Federal Reserve's ability in the pursuit of its maximum-employment and price-stability goals. Because such CBDC would not be USA genetic but one more CBDC and would lack not only of an underlying asset pool as the others even not so important for United States of America and it futur digital dollar but moreover it lacks of an underlying construction to enable folks on ability for wealth creation and extraction from the virgin space self dimensionable with UUS\$\$ and a fixed interest rate for the cash production to be shared to get rights to share cash results every 24 hours.Estabas lacunas evendenciam dúvidas sobre todas as cryptos and less but also sobre all CBDCs as it's coming before me.In my proposed design of FED's UUS\$\$ for United States of America the "digital liability" would be "FED's disponibility of economic spaces for anidation of central bank money in web dynamics production" creating conditions to generate a stream of money now again towards the FED !!! and to rearrange the Universocial Economy.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Filipe's answer : It would be positive or negative for stability in dependence on the CBDC design. I would trust a UUS\$\$ as FED's codified spaces to be created at the General Ledger of The Webcash Universocial Web" as FED's authorized spaces for anidation (reversible allocation) of folks monetary burdens who use the PSH Personal Savings Helper for the practice of the money data-valuation. US CBDC as FED's a liabity would not be great to resolve inflation and USA Debt ( no so important I agree but would prefer an organized in inflation compressor and investment resources cash stream for people wellbeing and to maintain USA leadership.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Again in dependence of the CBDC design. A design where the US FED authorize the use of an infinite number of it coded spaces for anidation alphanumeric and @stamped of monetary burdens to be provided of WUW's algorithm for the money data-valuation reproduction seems the opportunity to serve USA with a pioneer central bank currency driver included the processed money pumping by Google Cloud Platform in stream for the Universocial Sovereign Anchor of shared cash production at The USA FED and with cash results every 12:00 at New York local hour at The T.O.M. The Time Owned Market. Could a CBDC adversely affect the financial sector? Adaptations with upcoming reaction events would be daily webmatic treated by the total transparency of the WUW The Webcash and The T.O.M. The Time Owned Market and all insured by Google's Technical Structure.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Filipe's answer :The tools are considerated in standards of the USA FED and could insure full succès for implementation and to run the W3C Internet, drived in handleling by Google's Tech Services :- Draft protocoles and execution agreements ;- Regulations of US Congres ;- Creation of FED's codes for authorizing anidations at the WUW's General Ledger ;- Implementation of WUW The Webcash Universocial Web ;- Creation of the T.O.M. The Time Owned Market ;- Creation of the app P.S.H. - Personal Savings Helper ;- Creation of Do-G-Phones specifiques for to run PSH app ;- Testification phase at MIT.- WUW's notary documents for operations over digital properties "Owndated Webquantums".

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes it's important to preserve the general public access to a form of central bank money.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Filipe's answer : With great difficulties.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Filipe's answer : Agreements are allways the better solution even with the smallest nations.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Filipe's answer : All the related with a folks savings helper and actions of monetary policy sanitation.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Filipe's answer : Giving people the opportunity to create their own processable digital CBDC by anidation of monetary burdens in the spaces authorized by The US FED.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Filipe's answer : Let Google answer by protocol with you. No proble at all about that, and no costs for anybody. Because the CBDC UUS\$\$ could be designed for virgin wealth extraction with payements retained at the source making the thing free for everybody I said.

*14. Should a CBDC be legal tender?*

Filipe's answer : Of course by specific Congress Law.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Filipe's answer : A CBDC has not to pay interest. Because the interest rate (2%/day/365 daily payed) is use only to be transformed in a shared generator of cash results, with individualized times at production and a WUW's algorithm for the application of daily results upon UUS\$\$ digital objects with capital gains for everybody owners. These capital gains are prefered to the attraction of an interest rate which mechanics is inflationary as knone.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Filipe's answer : No limits in my construction of US CBDC the processable UUS\$\$ digital. Everybody may shift the asset from currency or banks balances at Central Bank of United States of America into Universocial US Dollar Digital Object , becoming owner and go back at any time without any cost or risk of loss.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Filipe's answer :No intermediaries at all. Just only providers for WUW The Webcash Universocial Web and for The T.O.M. The Time Owned Market two firms with self feeded and under control of :Congrès Law ;Standards US Treasury ;Standards US FED ;Standards W3C ;Standards Google-Alphabet ;Standards Time Unix for @ stamping over money data-valuations ;Inspections TIGTA over daily cash production and daily cash results.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Filipe's answer : Capabilities offline as Google's standards for works on human heath.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Filipe's answer : The app PSH to run the practice of the money data-valuation with finalization of the Personal Business as a Service for the creation of personalized digital savings in web dynamics using authorize spaces of USA FED for issuance of UUS\$\$ digital objects dollars is offered for free by WUW in agreement with Google and USA FED. Requirements : Inscription of Identity at the WUW's General Ledger and wil to shift from the two kinds of the US Central Bank money in the third form which is a set of digital objects with legal tender.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Filipe's answer : Tecnologia Google Cloud Platform at least for any changes of rights and ownerships in basis of the service of handling of the WUW's General Ledger with certifications included and service cash back when the user of the PSH data-valuation app decides to push the button "cashCall". No proble with bank system. Well, even if we dont nee the last computacional Google's abilities we would preserve the standards for complete efficacity.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Filipe's answer : United States is the first technological word's nation. W3C serves the world peacefull. Google's is able to make another search engine to identify any digital object as UUS\$\$ with legal tender.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Filipe's answer : A big quantity of benefits such us for exemple the free service of inheritance inventory, or simply a "flashed of individual position" provided with a set of dynamic counters for evaluation and deals.

---

*Name or Organization*

ROXE (Andreas Jobst, Chief Economist)

*Industry*

Payment System Operator or Service Provider

*Country*

United States of America

*State*

New York

*Email*

andy@rox.e.io

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

AML/CFT and illicit flows: greater (centralized) transparency about aggregate money flows enhances system-wide compliance with AML/CFT and sanctions financing regulations (which has proven difficult to implement consistently across crypto-assets); also helps reduce tax evasion and financial crime (incl. fiat counterfeiting). LOLR: CBDC helps restore the CB's role as "lender of last resort" (LOLR) for digital transactions that would otherwise be conducted via crypto-assets that remove the CB's control over monetary aggregates and the capital account; deposit insurance for CBDC would not been needed by construction. Money velocity increases capital allocation by raising the opportunity cost of holding cash, thus, increasing money velocity while discouraging precautionary cash savings/hoarding. Cost-efficiency of financial intermediation: lower transaction costs by increasing competition, widening access to services, promoting financial inclusion, and opening the possibility of complementary services offered on social networking and e-commerce platforms of global scale; lower cost for retail banking operations and financial infrastructure in areas where the use of CBDC can be more predominant. Credit analysis: availability of data mining & analytics tools could enhance risk management, and, thus, lower the cost of risk for new lending. Capital markets: a wholesale CBDC could facilitate more efficient issuance, trading and settlement as well as processing of subsequent corporate actions, such as dividend or interest payments.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

While CBDCs contribute to efficiency and innovation in retail payment systems, including cross-border payments, similar results could also be achieved without the need of a CBDC (e.g., instant payments). Moreover, the issuance of isolated domestic CBDCs does not seem to be the optimal way for improving cross-border payments efficiency.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

CBDC could improve financial inclusion by providing access to efficient, cheap, and real-time payments at lower cost outside the formal banking system.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

The introduction of CBDC increases the opportunity cost of holding cash and/or hoarding, which is likely to increase the velocity of money due to a lower elasticity of money demand to a change in real rates. This will increase the efficiency of capital allocation and enhance the effectiveness of price-based monetary policy, with a higher probability of reaching the optimal policy trade-off between stable inflation and reaching potential output.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

CBDCs could be easily understood as a safer store of value than deposits and commercial banks money. Thus, a CBDC may be used as a store of value (not only as a means of payment), which could cause a shift of commercial banks' deposits to the CBDC. Banks'

deposit base could come under pressure, but credit provision must be sustained even during the transition. Today commercial banks create money as a counterpart of loans financing the real economy. With CBDCs, central banks could become a main financier of the economy, although central banks are not ready to fulfill that function for which they have no capability nor mandate.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

It is important for the US to develop its own CBDC. Foreign CBDCs (as well as stablecoins and other private crypto-assets) could reduce monetary policy autonomy through currency substitution and worsen vulnerabilities from currency mismatches. Without appropriate safeguards, they could facilitate illicit flows and make it harder for regulatory authorities to enforce FX restrictions and capital flow management measures.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

There are several tools to encourage the use of CBDC for payments rather than store of value, i.e., to reduce the competitiveness of CBDC versus bank deposits (e.g. limits on individuals' holdings or transactions and remuneration); these must be effective under all different circumstances. To limit the use of CBDC as a store of value, one of the most commented options would be to install a limit of CBDC holding per individual. Another mitigating option would be a two-tiered remuneration structure, in which an initial amount below a certain threshold may enjoy a remuneration close to market rates, while quantities exceeding that threshold would be discouraged by a remuneration consistently below the policy rate. Still, this tool may not be effective in crisis periods or low interest environments. Depending on the remuneration of the CBDC, rates paid to depositors and savers, and therefore on the cost of funding and the cost of credit will adjust. Central banks should also consider providing alternative sources of funding to banks should clients decide to transform their commercial bank deposits into central bank liabilities. Finally, the programmability of CBDC, including stability mechanisms, can help mitigate operational risk.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

The declining cash use should impede the public's access to central bank money, especially for transactions that do not involve banks (or other trusted third parties). While the evolution to a cashless society is likely, the diminishing importance of fiat increases system-wide risks from bank failure(s) affecting commercial bank money. In addition, in case of a natural disaster or any other wide-spread emergency, CBDCs can be used to distribute relief funds more effectively.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

There has been a significant increase in the efficiency of domestic and cross-border digital payments with real-time settlement capabilities. While this evolution will continue with or without CBDC, a CBDC allows for better management, end-to-end accountability, end-to-end-monitoring and a wide spectrum of possibilities for payments, collections, disbursements for individuals and businesses alike.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Foreign CBDCs (as well as stablecoins and other private crypto-assets) could reduce monetary policy autonomy through currency substitution and worsen vulnerabilities from currency mismatches. Without appropriate safeguards, they could facilitate illicit flows and make it harder for regulatory authorities to enforce FX restrictions and capital flow management measures. Thus, the near-term availability of a CBDC would be desirable; however, given the dominant reserve currency status of the USD, the Federal Reserve is likely to have more time to develop its own CBDC compared to many (much smaller) open economies.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Traditional monitoring of monies has been done by means of tools that are capable of looking into currency, wires, ACH, bank accounts, and other sources of paper trails. CBDC allows for

multiple data points to be identified, measuring, monitoring and mitigating; cutting several necessary steps from todays' way of identifying, measuring, monitoring and mitigating risks.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

The CB can set transaction limits to keep certain transactions anonymous if they fall below the set threshold. For instance, the Roxe payment system and CBDC solution can track the sum of all the transactions per customer and report to the CB when a user exceeds the defined threshold. The CB could also set up (1) a separate smart contract for a "cash shuffle protocol" to execute the transactions internally so it cannot be traced to the original user; and/or (2) a centralized node in RSS to transmit transactions so that the original user or wallet cannot be traced.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

On a permissioned blockchain (used by Roxe), it is very unlikely to have a cyber-related event. Adding more supernodes to the network enhances its resilience. The higher the number of supernodes, the less the impact to the blockchain. For services and operations that have access to the blockchain, they should be backed up on multiple servers and follow standard IT disaster recovery processes. Much higher than normal load could cause transaction timeouts, transactions to get canceled, or transactions to get backed up and process slowly. Roxe designs services in such a way that monitors and reacts to sudden load hikes and auto scale in critical services to minimize this risk. Roxe does not use any gateways or bridges with other blockchains that add operational/cyber risk. Operational risk from internet disruptions can be mitigated with nodes being located globally in different regions. Operational resilience are provided by multiple data centers, multiple physical location based horizontally scalable infrastructure, and redundancy in all key system components to ensure when one server or even one data center is down, the system will still mostly recover automatically to keep operating.

*14. Should a CBDC be legal tender?*

CBDC is a digital form of currency that is backed by a Central Bank and through that has legal tender status.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

A CBDC can but does not need to pay interest. It is preferable to develop programmability that allows the interest on CBDC to drop below the effective policy rate.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Yes. Avoiding the use of CBDC as a store of value (which risks disintermediating the banking sector), one of the most commented options would be to install a limit of CBDC holding per individual.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

The common intermediaries should be commercial banks as well as payment service providers (PSPs). Ideally, they would provide retail clients account-based access via a custodial web wallet.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

CBDC should have "offline" capabilities and allow secure offline payments just like paper currency. There are multiple ways in which this can be achieved: QR Code: Unique QR code associated with a wallet could be stored offline and used to pay. The QR code works like google authenticator, where the QR code changes every few seconds so it cannot be stolen. However, the mobile device data could be stolen, so it will be important to verify that: (1) the device ID of the QR code or tokenized wallet holder belongs to the original holder; (2) users can set up an upper limit for offline transactions; and (3) long as one party is online, these details can be verified. Tokenizing wallet address: The user's wallet address can be tokenized via encryption and stored on the customer's device. With the token, the customer could pay a merchant even when offline. Merchants are online but can verify offline customers payments. Today, most smart phones are equipped with secure hardware to store keys that can be accessed only by users' biometrics like face authentication or fingerprint or

password. Non-custodial hardware wallet: In a hardware wallet, the user's cryptographic keys that authorize funds transfer may be stored and managed on the user's personal device itself. This property makes cryptocurrency wallets more cash-like. This solution however, also exposes the user to the risk of unrecoverable financial loss if the wallet or device hosting it is compromised or lost. This solution protects the user against data theft and double spending. Counterfeit CBDC: It's very difficult to counterfeit CBDC's on the blockchain. Roxe verifies that the address of the token comes from the recognized blockchain and not counterfeit to mitigate this risk.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes. Making a payment with CBDC to merchants in-store should be as simple as scanning a QR code. Roxe App supports this functionality.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

To recognize CBDC, payment platforms would need to add and support CBDC as a new digital asset type. In the case of Roxe, CBDC can be swapped into fiat before sending the transaction to another payment platform. Hence, Roxe can support transferability across multiple payment platforms w/o making any adjustments to payment platforms.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

The operating model and governance of CBDC is crucially dependent on technology innovations. For instance, the speed of transactions per second could be improved to support scaling operations. Roxe's blockchain provides the maximum speed of 3,200 tps and blocks get mined every 0.5 seconds.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Interoperability with other payment solutions would facilitate the deployment of the CBDC while contributing at the same time to the overall adoption of new forms of digital money and payments. CBDCs should be integrated into broader services enabling intermediaries to offer new value-added services. Access to CBDCs should be provided through supervised intermediaries that are best suited for providing end user services and adapting to evolving user needs. It is important to ensure that the central banks develop a robust and flexible core infrastructure that leaves enough room for the private sector to deploy profitable business models that encourage further innovation and investment in the development of value-added services. Interoperability with other jurisdictions with a set of aligned standards, e.g. as defined in the G7 Public Policy Principles for retail CBDC, would avoid fragmentation and friction in cross-border and cross-currency processes as experienced today for cross-border payments. Achieving technical interoperability and a level of legal and regulatory harmonization for CBDC would greatly contribute to the G20 roadmap of enhancing global cross-border payments. The anonymity/privacy trade-off should be carefully considered, not only in comparison to cash (with a view on reducing illicit use of money) but also in comparison to other digital payment solutions facilitated by the private sector. A regulatory level-playing field for all types of digital payment solutions (i.e. CBDC and private sector solutions) in terms of AML controls and traceability is equally important. The Fed should also explore the opportunities offered by different design options, such as the potential addition of programmability features to CBDCs; this could provide the private sector new ways to innovate, as well as the implementation of embedded supervision which could improve the efficiency and effectiveness of existing supervisory processes.

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*Name or Organization*

Jakub

*Industry*

Bank, Large (\$90 Billion or More in Assets)

*Country*

Czechia

*State*

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Yes

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Yes

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Yes

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Yes

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Bank is ČSOB Swift/BIC code : CEKOCZPP and number conto:CZ0903000000000298329537

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

No

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

No

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Yes

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

No

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

No

14. *Should a CBDC be legal tender?*

No

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

No

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

No

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

No

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

No

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

No

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

No

21. *How might future technological innovations affect design and policy choices related to CBDC?*

No

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

No

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*Name or Organization*

*Industry*

Bank, Large (\$90 Billion or More in Assets)

*Country*

United States of America

*State*

California

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Local law enforcement and some people assisting shouldn't have authority to team up against 1 without cause at all

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Don't steal from people who own property like the oldest bitcoin that exists I have the Satoshi Nakamoto wallet in my possession and it shows the transaction date when I bought it on July 2021 150 million

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Negative

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Pay me

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

My money back

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

n/a

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

N/a

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N/a

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

N/a

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

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N/a

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

N/a

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N/a

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N/a

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

N/a

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N/a

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

N/a

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

N/a

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

N/a

*21. How might future technological innovations affect design and policy choices related to CBDC?*

N/a

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

N/a

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*Name or Organization*

*Industry*

Bank, Large (\$90 Billion or More in Assets)

*Country*

United States of America

*State*

California

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Local law enforcement and some people assisting shouldn't have authority to team up against 1 without cause at all

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Don't steal from people who own property like the oldest bitcoin that exists I have the Satoshi Nakamoto wallet in my possession and it shows the transaction date when I bought it on July 2021 150 million

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N/a

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

N/a

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

N/a

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

N/a

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

N/a

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

N/a

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

N/a

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N/a

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

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*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

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*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

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*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

N/a

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

N/a

*21. How might future technological innovations affect design and policy choices related to CBDC?*

N/a

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

N/a

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*Name or Organization*

Nicholas Luczak

*Industry*

Individual

*Country*

United States of America

*State*

Michigan

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

A non-interest bearing asset, the US CBDC, could be substituted slowly into the US Financial market for monetary assets, providing widely available liquidity through private and accountable transactions. Like every individually issued dollar bill has its unique code, "digital dollars" could serve a similar role. Digital dollars and physical cash, could become a new reserve asset. The ratio of digital dollars to physical cash, determined by monetary and fiscal policy makers, would be regularly published, along with the total quantity of both available to an anonymous hypothetical individual.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

The "digital dollar" and its partnership with physical cash, could serve as the underlying denominator globally. Moreover, direct control of both can be accomplished by both the Treasury and the Fed.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

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*Name or Organization*

Mastercard

*Industry*

Payment System Operator or Service Provider

*Country*

United States of America

*State*

New York

*Email*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The Federal Reserve's discussion paper provides a welcome and thoughtful analysis of the potential implications of implementing a CBDC in the United States. One topic that could warrant further discussion is the architecture and operating model that would – if the Federal Reserve decides to proceed with the creation of a retail CBDC – best align with (i) the underlying policy goals motivating the creation of a CBDC and (ii) the existing landscape of the U.S. financial system. We strongly endorse the position of the Federal Reserve that – if a CBDC were to be created – the United States financial ecosystem and its consumers would be best served by an “intermediated” system where “the private sector would offer accounts or digital wallets”. This public private cooperation on what is sometimes called a “two-tier” CBDC is critical to ensuring an open and competitive payment ecosystem characterized by strong innovation. However, there are many different ways to structure public-private cooperation within such a system, some of which may be more or less suited to the policy goals of a given CBDC. In any case, a clear governance framework which sets out the responsibilities of the public and private sector, is needed. For example, in the 2021 Bank for International Settlements (BIS) Working Paper (#928) Auer and Böhme outline two distinct approaches to deploying a two-tiered CBDC. The first is a ‘Hybrid Architecture’ where the central bank retains a copy of all retail CBDC holdings, and transactions are processed directly through updates to the central bank ledger. The second approach is an ‘Intermediated Architecture’, which we refer to as a ‘Federated Architecture’ (to avoid confusion with the Federal Reserve’s use of the term intermediated). Under this approach, the central bank records wholesale balances, and private sector intermediaries clear and settle CBDC balances bilaterally. Although we believe that further study is required to determine if a U.S. CBDC is warranted, a Federated Architecture is more likely to align to the goals of the Federal Reserve’s policy objectives. This approach is aligned with the existing allocation of public and private responsibilities within the financial system, and by extending a broader set of capabilities to the private sector (compared with the Hybrid Architecture approach), it would also provide a more robust platform for the development of value-added innovations. Critically, a Federated Architecture would also support the Federal Reserve’s goal of creating a privacy-protected CBDC. As we discuss further in our response to Question 12, a Federated CBDC avoids the creation of a ‘master ledger’ at the central bank by fragmenting transaction data across supervised intermediaries and also eliminates the data-protection risks of centralizing all transaction data. Beyond questions of CBDC architecture, two additional factors that will be important to consider are (i) the mechanisms by which CBDC payments are accepted and (ii) the incentive structure to ensure sufficient private sector investment in a secure, competitive, and innovative ecosystem. As we explore further in our response to Question 22, enabling acceptance points is one of the greatest challenges to driving mass adoption of a new payment solution. Adopting an ‘open acceptance’ framework, using existing acceptance technologies and networks to facilitate payments by CBDC, can maximize the day-one ubiquity of the system and minimize complexity of adoption for users and merchants alike. Finally, while the selection of a Federated CBDC Architecture and the adoption of an open acceptance framework can minimize the complexity of integrating with a CBDC, there is no getting around the fact that building new wallet solutions, integrating with new payment infrastructure, and enabling the various links in the payment value chain are all costly activities. Sustainable payment ecosystems are dependent on a delicate balancing of incentives between those stakeholders who bear the costs of enabling payments and those who benefit from payment services. In order for a central bank’s CBDC infrastructure to sustain a vibrant and competitive ecosystem of payments innovators, incentives will need to exist that allow payment service providers to generate an appropriate return on their investments. If the U.S. chooses to develop a CBDC, we are ready to work with the Federal Reserve to ensure a CBDC will flow seamlessly across existing payment networks. As evidenced by our history, we are devoted to

providing both system-wide resilience as well as open and user-friendly consumer choice. Mastercard has deep expertise in building and operating secure, high-performance payment networks. We govern & operate the world's fastest payments processing network (capacity of > 20,000 transactions per second), connecting consumers, financial institutions, merchants, governments, and businesses in more than 210 countries and territories.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Below, we focus in our response on CBDC as a means of payment. While a CBDC could play a role in payments innovation, increased financial inclusion, visibility into economic activity, and improved efficiency of national and international payment flows, all of these potential benefits can also be achieved through facilitation of a vibrant private sector and competition in payments. For example: real-time payment systems, certain stablecoins, and the development of blockchain based "tokenized deposit" capabilities by commercial banks and fintech companies have great potential to lower costs and improve the speed and efficiency of payment flows. Concurrently, the growth of open banking, open finance, and the ascendency of neo-banks will increase competition and support a more inclusive financial system. Therefore, while a CBDC is one approach to reducing frictions in payments and supporting a more inclusive financial system, it is not the only means of doing so. Ultimately, while CBDCs are an exciting new tool in a central bank's toolbox, that does not mean they are the right tool to fix every problem nor that every country needs a CBDC. In some cases, a CBDC might be an appropriate tool for the job, but not the only appropriate tool. In other cases, established systems and services or innovations other than CBDCs may be a better fit to achieve a central bank's goals. Further, the Federal Reserve should consider the precedent it would be setting in regard to inserting itself into a part of the financial system which has historically been driven and maintained by the private sector. Such a shift dramatically alters the stance of the public sector's role in facilitating payments innovation. Therefore, we believe that the Federal Reserve should carefully analyze the case for a CBDC, considering the unique features of the U.S. economy to find the approach that best fits our nation's unique payment needs.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

A CBDC might have the potential to increase financial inclusion. However, the central features of a CBDC (i.e., digitized central bank money and a new method of payment) do not solve many of the problems that result in people being unbanked. Lack of access and lack of trust are fundamental issues that keep people out of the formal banking system. Those issues can be addressed without a CBDC. For example, according to a report by Maiden Labs, "Centering Users in the Design of Digital Currency," many unbanked Americans are unbanked because they distrust banks, and this distrust is typically rooted in fee practices. In particular, unbanked Americans have concerns about not understanding when they will incur checking account fees. A CBDC will not have inherent qualities that would address this distrust, but improved transparency and competition of financial services in general may help. In the context of a CBDC, this responsibility would fall to the private sector intermediaries. The same is true of access. That is, the manner in which a CBDC is intermediated could improve access, but so could other innovations in our financial system that are constructed on the existing commercial bank money infrastructure. Moreover, in line with our response to question 2, we believe it will be important for the Federal Reserve to carefully analyze the capacity of a CBDC to improve financial inclusion, comparing and contrasting the strengths and weaknesses of a CBDC with other approaches. For example, in their recent paper "The Treasury Option: How the US can achieve the financial inclusion benefits of a CBDC now", Jackson and Massad explore how an expansion of the U.S. Treasury Department's popular and well established Express Direct offering "would facilitate distribution of federal benefits and provide low-cost, no-frills payment services" providing "a faster, easier way to achieve some of the primary objectives of those who favor a CBDC". Such a program would be "much easier to establish and could be implemented now." A focus on enhancing existing programs, such as Express Direct, would not require the costly and technically complex deployment of new infrastructure or the navigation of macro-economic challenges unique to a CBDC (discussed further in our response to questions 4 - 7). Before proceeding with the development of a CBDC on the ground of financial inclusion, the Federal Reserve should closely analyze this premise, and compare it with other proposed approaches to fostering inclusion, to determine which are best positioned to meet the genuine needs of financial underserved Americans.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

A U.S. CBDC would require the Federal Reserve to balance the potential adverse effects of

deposit substitution with the potential to add new tools to effectuate monetary policy. The Discussion Paper addresses the uncertainty surrounding the share of assets that individuals might choose to hold in a CBDC at any given time—particularly in relation to their holdings of commercial bank deposits. Here, the Federal Reserve faces a serious challenge. To be considered a success, a CBDC must have sufficient user adoption to justify the time and investment made by the Federal Reserve. A CBDC must also be used with enough frequency to provide a sustainable business model for multiple competing payment interface providers. However, it would clearly not be desirable if a CBDC becomes so popular as to drive large-scale substitution away from commercial deposits, undermining the stability of the U.S. financial system or disrupting established channels of credit creation. Several factors may frustrate efforts to quantify and mitigate the risk of substitution. First, it will be difficult to determine the likely degree of substitution of CBDC for commercial deposits prior to the launch of a CBDC, particularly absent the launch of a CBDC in another major economy. To cite research by the Bank of England, “gauging the likely shift from deposits into CBDC is challenging because to date no major economy central bank has introduced a CBDC.” Second, until a CBDC system has run for a significant period, it will be difficult to ascertain how consumer’s CBDC usage patterns will vary in response to exogenous factors. While the Discussion Paper remarks that “[t]hese concerns could potentially be mitigated by CBDC design choices,” the implementation of design choices would be in the hands of independent intermediaries and outside of the direct control of the Federal Reserve. Finally, it is important to note the nature of digital services often enjoy extremely steep adoption curves, potentially limiting the period that the Federal Reserve would have to adjust a production system in response to early data. None of these challenges should be taken to suggest that a CBDC could not be deployed; however, they suggest that modelling or observation of CBDC adoption trends in other jurisdictions may not be enough to accurately estimate substitution of CBDC for commercial deposits. Instead, effectively identifying substitution risks and formulating mitigation and management strategies may demand larger scale, and longer duration, controlled-access pilots than have been required for previous developments in U.S. payments. The benefits of new monetary policy tools potentially made available through a CBDC also remain uncertain. For example, while a CBDC might offer a way to stimulate aggregate demand through direct transfers of money to the public (so-called helicopter drops), a key challenge to these transfers is the identification of recipients and accounts, and that challenge is not solved by a CBDC. The Bank for International Settlements (BIS) reaches this conclusion in a report titled “Central Bank Digital Currencies: Foundational Principles and Core Features.” In fact, the BIS report concludes that “monetary policy will not be the primary motivation for issuing CBDC.”

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Large-scale or volatile deposit substitution caused by a CBDC could have several implications for financial stability, many of which have been covered in detail by academic and central bank publications in recent years. Some of the frequently cited potential implications are discussed below.

1. Implications on the cost and availability of loanable fund  
The introduction of a CBDC could lead to a reduction in commercial bank deposits, as bank customers would be able to choose to move some of their deposits to the CBDC. Since deposits constitute an important source of low-cost funding for banks’ lending operations, the outflow of deposits at a significant scale could have adverse consequences for the cost and availability of credit in the broader economy.
2. Implications on monetary policy implementation:  
The introduction of a CBDC could potentially allow changes in policy to be passed on to households more quickly than via commercial banks; particularly if unconventional forms of monetary policy, such as direct central bank disbursements to consumers, were to be explored. Concurrently, an overall reduction in the stock of commercial bank money could theoretically reduce the effectiveness of more traditional monetary policy operations executed via changes to interest rates.
3. Financial stability generally:  
If consumers see a CBDC as less risky than traditional deposits during a period of financial stress, it could trigger a “rush to safety” that would undermine the stability of otherwise solvent banks. While consumers already have access to central bank liabilities through cash, a CBDC may have significantly fewer barriers to large scale transfers, as it would not require the consumer to physically obtain or transport cash and may be perceived as less subject to theft. The introduction of a CBDC may significantly increase the volatility of deposit substitution during times of crisis—placing pressure on commercial banks’ liquidity and solvency positions. Possible methods of mitigating these risks are discussed in response to question 7 below.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

The introduction of a CBDC has the potential to shift consumer demand for central bank

money relative to commercial bank money. If deposit substitution were widespread or with significant volatility, it could potentially have unintended adverse consequences for the cost and availability of loanable funds and the overall stability of banks. Please see our response to question 5 for a discussion of these issues. Moreover, as we discuss in our response to question 4, it would be difficult to determine the likely degree of substitution of CBDC for commercial deposits prior to the launch of a CBDC, particularly absent the ability to observe the launch of a CBDC in another major economy. And, until a CBDC system has run for a significant period, it would be difficult to ascertain how consumers' CBDC usage patterns would vary in response to exogenous factors and therefore how deposit substitution will unfold.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Since the rate of deposit substitution cannot be known now, and since the potential adverse implications of uncontrolled large-scale or volatile movements between commercial deposits and the CBDC are significant, many central banks have concluded that they will require policy tools for mediating the flow of deposits. Here, we outline three potential mechanisms for consideration and exploration by the Federal Reserve. Limits: The most effective means of mediating the flow of funds between the CBDC and commercial deposits would be to limit an individual's holdings of CBDC at any given time. In order to implement this policy, while also ensuring that users could always receive a payment, the European Central Bank has suggested that a "waterfall" approach could be employed, whereby incoming CBDC in excess of the holding limit would be converted automatically to commercial bank money and be deposited in the payee's account. Remuneration: Another approach would be to discourage the holding of a CBDC by introducing an opportunity cost to holding the CBDC relative to commercial deposits. This could mean providing a zero rate of return on CBDC holdings. This could be delivered on a tiered basis with holdings below a certain level providing zero-yield - similar to cash - and holdings above that level subject to a negative rate of interest. However, some commentators—including Burkhard Balz, Member of the Executive Board of the Deutsche Bundesbank—have expressed concerns that this approach may not be enough to halt a "digital bank run" during a financial crisis. Moreover, the use of highly negative rates to constrain deposit substitution during a crisis could face significant popular opposition.

Redistribution of funds: A third means by which the Federal Reserve might mitigate the implications of large-scale deposit substitution would be by offsetting the accumulation of liabilities on its balance sheet resulting from adoption of a CBDC with the provision of wholesale funding to financial institutions. Such a policy could be effective in mitigating the impact of CBDC issuance on the cost and availability of credit in the U.S. economy. However, it is less likely that such a policy would—on its own—be an effective means of mitigating more volatile swings in public demand for the CBDC, such as during periods of intense financial stress.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

No, we believe it is not strictly necessary. This is because electronic methods of payment using commercial bank money have significantly expanded the array of payment options available to consumers and will continue to be a viable substitute for cash as the use of cash declines. For banked consumers in the United States, there likely would be no meaningful distinction between CBDC (central bank money) and deposits (commercial bank money) when making a payment electronically; as the two would presumably be easily interchangeable and readily available. Consumer choice in a payment method is determined by ease of use, acceptance by the merchant, and other benefits or incentives. Current electronic payment methods address consumer need and, thus, should obviate the need for CBDC as a way to compensate for a decline in cash use. However, we recognize that some economists have suggested that if consumers were to abandon their use of cash entirely it could have unintended consequences for a central bank's control of monetary policy. These concerns are best articulated by the Sveriges Riksbank in their 2018 "e-Krona Project Report 2" where they note that: "The fundamental trust in the Swedish monetary policy system risks declining. In times of financial unease, the knowledge that money in bank accounts can always be converted to risk-free state money in the form of cash comprises a lynchpin. If cash is marginalized, this feature will be eroded." In other words, if the accessibility or acceptance of cash were to significantly decline, consumers access to central bank assets would be reduced, which could potentially cause or accelerate a loss of confidence during a financial crisis. This concept was explored by the Bank of Canada in its May 2020 Staff Discussion Paper, where the authors concluded that in the absence of cash, a CBDC is not required to ensure monetary stability, provided that frameworks exist to ensure trust in commercial bank money (a framework already maintained in the United States). However, they note that in circumstances where cash has fallen into disuse, a CBDC may be helpful in other ways.

Given this, they conclude that the question of whether a CBDC is required will be “a judgement call” that is subject to the unique context of a given country. This analysis suggests that a CBDC (or another method of public access to a form of central bank money) is likely not required to safeguard the monetary system of the United States, but that it might be reasonable for the Federal Reserve to explore deploying to provide additional support for public confidence in money.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

In a scenario where the U.S. chooses not to issue a retail CBDC, there is no reason to believe that the U.S. payment landscape would not continue to be characterized by vibrant competition and world-leading innovation. Absent the issuance of a retail CBDC we would expect to see the continued development of safer, faster, lower-cost methods for domestic and cross-border digital payments. The existing U.S. payment system creates strong incentive for companies to improve payments. Recent developments, such as a private sector real-time payment system in the United States, demonstrate that industry is capable and willing to achieve meaningful evolution in payment methods. Also, the benefits of a CBDC for digital payments that the Federal Reserve identifies in the Discussion Paper—such as streamlining cross-border payments “by using new technologies, introducing simplified distribution channels, and creating additional opportunities for cross-jurisdictional collaboration and interoperability”—can be realized without a CBDC. U.S. companies realize this and are investing heavily in new technologies, such as blockchain and AI, to drive further improvements in domestic and cross-border payments. However, we recognize that the evolution of the digital payments marketplace might benefit in the long run from a tokenized form of the U.S. dollar, particularly for wholesale payments, if other countries move to a digital currency model. Thus, it will be important to consider whether sustaining the U.S. financial system as the world’s leader and the U.S. dollar as the world’s reserve currency would be supported by the issuance of a CBDC in the United States. If so, the need for a CBDC might be limited to wholesale transactions between licensed financial institutions, which would present fewer challenges from a deployment, management, security, and macro-economic perspective than a CBDC that is available for retail use.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The Federal Reserve should monitor the decisions by other OECD nations and evaluate whether the development of a U.S. CBDC would be important to maintaining the preeminence of the U.S. financial system and sustaining the role of the U.S. dollar as the world’s reserve currency. Further, the Federal Reserve should not take a binary approach to any decision regarding the development of a CBDC, but rather should focus on use cases (wholesale, retail, etc.) and risk mitigation. By evaluating the decisions of other nations in this context, the Federal Reserve can best determine whether a CBDC is appropriate for the United States and, if so, the characteristics that CBDC should have.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

For ways to manage the different risks associated with CBDC, please refer to our answers to questions 7, 13, and 22.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Comparisons are frequently made between a CBDC and the only other form of central bank money currently available to retail customers – physical cash. However, unlike cash which enables anonymous and untraceable transactions between counterparties, a CBDC must be structured in a way that enables it to achieve compliance with AML and CFT regulations, detect fraud, and adequately secure itself, its users, and its data, against cyberattacks and other malicious/illegal activity. Identity verification will therefore be key to any successful CBDC deployment, particularly when we consider that any fast and easily accessible means of making payments attracts bad actors who seek to exploit the speed of payments to commit fraud (e.g., Account Takeover) and scams (e.g., romance scams, investment scams). Once consumers and businesses funds are stolen, criminals often use these illicit funds to support other criminal activities by moving the funds across the payments system through a complex chain of transactions across multiple financial institutions and jurisdictions. At the same time, while any payment requires high levels of privacy and data protection to be attractive to consumers, a CBDC may face an up-hill battle – particularly given persistent concerns among certain groups that a CBDC could be used as a tool of government surveillance. In this

respect, it is noteworthy that existing payment solutions already provide for high levels of privacy through sophisticated techniques such as encryption of payment information or tokenization of card numbers. Fortunately, like any form of digital payment, a CBDC could be designed to provide personalized levels of privacy and optimize individual choice over how their personal information is used and shared. One of the simplest ways of doing this would be to adopt a two-tier federated approach to a CBDC (referred to by the BIS as a ‘two-tier intermediated CBDC’) where supervised intermediaries onboard CBDC users and execute retail CBDC payments from aggregated accounts held at the central bank. Under this approach the central bank retains full control over the issuance and distribution of the CBDC but does not have visibility into individual users’ accounts and payments. Moreover, the fragmentation of data across the CBDC ecosystem avoids the creation of a data ‘honey-pot’, limiting the impact of any individual data breach. Additionally, the Federal Reserve may want to consider how this approach would be combined with one or more forms of emerging technology designed to support user-privacy without sacrificing security or compliance, such as zero knowledge proofs (ZKPs), Shamir Secret Sharing (SSS), and Multi Party Computation (MPC). However, it will be important to remember that many of these techniques are in their technological infancy and would require significant testing and development in order to validate their security and scalability.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

One area of risk that was given limited consideration in the discussion paper is the enormous complexity of mitigating fraud and cyber-risk across a retail CBDC ecosystem. The cost to the global economy of cybercrime is expected to grow by 15 percent per year over the next five years, reaching \$10.5 trillion USD annually by 2025. A retail CBDC will inevitably face sophisticated fraud and cyberattacks from both private and state-sponsored actors. CBDC users must trust that the system will be accessible and operational where and when it is needed; that their funds, accounts, identity, and other data are secure; and that they will be protected in the event of fraud. Effectively deploying the strategies and techniques needed to secure a retail payment system will require the Federal Reserve to consider a number of new dimensions. Firstly, retail payment systems have significantly more endpoints than the wholesale payments system, with each opening offering a potential point of vulnerability. Effectively securing these endpoints requires the development of tools that work across the payment ecosystem proactively monitoring, detecting, and acting on security and cyber risks across their digital supply chain. Secondly, while supervised intermediaries in a two-tier retail CBDC ecosystem will likely be responsible for conducting their own Know Your Customer (KYC) and Anti-Money Laundering (AML) activities, their inability to track transactions beyond their perimeter leaves them vulnerable to financial criminals—who have developed tools that exploit such limitations. To avoid inadvertently facilitating financial crime, central banks that issue CBDCs may need to do more than set stringent KYC and AML standards for supervised intermediaries; they may also need to curate a network-level view that empowers all intermediaries to more effectively identify and trace financial crime as it moves across the ecosystem. Finally, it will be important to consider that modern cybercriminals exploit both organizational silos and national borders to undermine the safety and security of critical systems. The result is a world where no organization pursuing a strategy of cybersecurity ‘self-reliance,’ regardless of their sophistication, can be confident that their systems are secure. The safest organizations will be those that ‘travel together’—sharing critical insights in real-time from a network that is global in scope. To effectively secure a retail CBDC from both foreign and domestic threats, central banks will need to deploy ecosystem-level monitoring tools that are global in scope; relying on partners to provide critical intelligence from beyond their own borders.

*14. Should a CBDC be legal tender?*

If the Federal Reserve develops a CBDC, legal tender status would be desirable. Interestingly, the Federal Reserve explained in a research note titled “Preconditions for a general-purpose central bank digital currency” indicates that giving a CBDC legal tender status will not ensure the willingness of participants in the economy to accept CBDC as payment. Instead, that would largely depend on the credibility of the CBDC, including the soundness of the legal framework underpinning it. However, we agree with a comment from the European Central Bank executive board member Fabio Panetta that “it would be quite awkward not to have legal-tender status for an additional instrument issued by a central bank.” The lack of legal tender status would likely be a material hurdle in getting the public to accept and use CBDC. In other words, legal tender status might be necessary (but possibly not sufficient) to establish the credibility of a CBDC with the public.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Paying interest on a CBDC may significantly exacerbate deposit substitution risk. The Discussion Paper acknowledges this, and we agree that “an interest-bearing CBDC could result in a shift away from other low-risk assets, such as shares in money market mutual funds, Treasury bills” reducing “credit availability or raise credit costs for businesses and governments.” However, preserving a technical option to add a coupon (negative or positive) to a CBDC may be of interest to the Federal Reserve if it were to develop a CBDC.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

The establishment of quantity limits on individual holdings may be necessary to avoid destabilizing levels of deposit substitution, particularly during periods of financial crisis. Limits have the advantage of being easily understood by users and, if set at a reasonable level, should have little or no impact on consumer usability. Concurrently, they would provide commercial banks with a way to understand their potential exposure to deposit outflows. While a range of technical issues might need to be addressed—for example, how inbound payments that would exceed a user’s limit should be handled, or how a limit would be applied to an individual who has opened accounts with multiple private intermediaries facilitating CBDC access—these challenges appear solvable, particularly if addressed at the design stage. However, research by the Swedish Riksbank suggests that the use of limits could have the unintended consequence of disrupting parity between the market valuation of retail CBDC deposits relative to commercial bank deposits, particularly during a crisis. In their 2018 “e-Krona Project Report 2”, the Riksbank notes that: “It is the Project’s assessment that limitations on access to e-krona may be associated with problems. For example, it may be difficult to maintain parity between Swedish krona in the form of cash, deposits in bank accounts and reserves. Assume, for example, that the e-krona becomes very popular but that there is a maximum limit imposed on each person’s holdings. This could lead to the emergence of a market on which those who have not fulfilled their e-krona quota would be offering those who have the opportunity to buy e-krona in cash or by depositing money in a bank account at a higher than one-to-one price.” While this should not eliminate the use of limits from consideration, it does suggest that their design will require close consideration to ensure that any use of limits does not have unintended consequences. If the Federal Reserve developed a CBDC with quantity limits, we would suggest that the Federal Reserve establish a system whereby the amount of a CBDC transfer to an individual that exceeds the individual’s limit is allocated to a commercial bank account of the individual’s choosing. Such a system is technically feasible and would avoid the complications and uncertainty that often surrounds failed payments. Moreover, it may be possible to simplify the implementation of this capability by leveraging pre-existing payments infrastructure. Such a solution would need to be underpinned by instructions from customers during an onboarding process to permit the intermediary to perform this conversion and apply funds to a designated account. Due consideration would also need to be given to individuals who are unable to access a commercial bank account or choose not to have one. The Federal Reserve should study the most efficient means of shifting payments exceeding any CBDC holdings limit to ensure that the approach does not have unintended consequences on efficiency and stability of the U.S. payments system, nor on the financial inclusion of its most vulnerable users.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

If the Federal Reserve issues a CBDC and develops a two-tier federated approach, intermediaries would play a critical role in creating trust, meeting the needs of users, and enabling the successful adoption of a CBDC. As in the current ecosystem, it is likely that some firms may provide end-to-end intermediary services while other firms would specialize in particular intermediary functions. The goal of intermediary regulation should be to protect consumers, address AML/CFT risk, and mitigate systemic risk. Regulation should be functional and risk-based, so that intermediaries performing the same functions are subject to the same regulation, tailored to the risk related to the services provided. This approach is important to prevent gaps and arbitrage in the regulatory landscape and to enable fair competition. CBDC intermediaries should be able to provide a CBDC experience that addresses the following issues: Strong and varied user experience design: Consumers expect payment journeys to be recognizable, intuitive, and in some cases tailored to their unique needs. Ease of adoption: The success of a CBDC will depend on the adoption rate which, in turn, will depend on many factors such as security and convenience. Consumer education and awareness on the characteristics and capabilities of the CBDC will be key. Customer Identification: Intermediaries will need to develop an efficient onboarding process (e.g., sign-up, KYC, funding of accounts), conduct ongoing AML/CFT monitoring, and provide user education. Payment networks with strong payment technology expertise, such as Mastercard will have an important role to play if a CBDC is to be usable for payments and otherwise transferable in a manner akin to cash. Network intermediaries should focus on the following value drivers: Acceptance: A CBDC must be usable for a variety of in-person and digital

transactions to provide value as a payment mechanism. However, enabling acceptance points is a prominent challenge to driving mass adoption of a new payment solution. Consumers will be more likely to adopt a CBDC if it can be used on existing acceptance infrastructure and is supported by known and identifiable payment form factors (physical and digital) linked to the user's existing devices and accounts. Therefore, linking the CBDC to existing payment networks such as Mastercard would make adoption easier for both consumers and merchants. Commercial incentives could then encourage the private sector (e.g., wallet providers, merchants, etc.) to further expand the reach of those networks and achieve the key motivation for issuing a CBDC. **Interoperability:** Interoperability between payment systems avoids closed loops that reduce the fungibility of money, fragment liquidity, and limit competition. Here, interoperability with other stores of value (e.g., commercial bank deposits, prepaid accounts) would be important. **Consumer Protection:** Consumer trust is at the heart of payments. Individuals must have confidence that they are getting what they pay for and that they are protected in the event of fraud, disputes, refunds, or data misuse. This requires a framework of standards and rules that safeguard the security of every transaction while ensuring that all parties are treated fairly and equitably. The private sector could play a variety of roles in this effort, including the co-development of such framework and offering lines of cyber/fraud defense to the central bank or supervised private intermediaries. Additional consumer protection features may also be a value-added service offering. **Value Added Services:** A CBDC has the potential to serve as a foundation for innovative and value-added financial products and services developed by competitors within the private sector. Such value-added services may be varied, but a notable consideration is programmable payments—the ability for users to build simple conditional obligations (colloquially, “smart contracts”) into a payment. Programmability could theoretically support a wide variety of use cases, including escrow services, automated insurance claims, and the provision of installment loans at the point of sale.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

A defining feature of cash is that it does not require network connectivity to function. Offline payments would likely be a useful feature for CBDC in several edge cases. Emerging technologies may present opportunities to deliver this functionality while limiting the risk of fraud borne by payment counterparties. The handling of offline transactions by card-based ecosystems today may provide a model for facilitating offline CBDC payments – using a combination of technology and business roles to define liability and limit exposure. Mastercard uses ‘counters’ on the payment card chip to manage offline payments risk. These can be set to allow offline transactions only when the number of offline transactions is below a threshold. These configurable risk parameters allow the convenience of offline transactions for consumers and merchants at a manageable level of risk that is tolerable for all entities.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

For a CBDC to provide consumers value as a payment mechanism, it must be usable for a variety of in-person and online transactions. However, enabling acceptance points is one of the greatest challenges to driving mass adoption of a new payment solution. Consumers will be more likely to adopt a CBDC if it can be used on existing acceptance infrastructure and is supported by identifiable payment form factors (physical and digital) that are linked to the user's existing devices and accounts. Therefore, linking the CBDC to existing private payment networks would make adoption easier for both consumers and merchants. Commercial incentives could then encourage the private sector (wallet providers, merchants, etc.) to further expand the reach of those networks.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Interoperability between payment systems avoids closed loops that reduce the fungibility of money, fragment liquidity, and limit competition. For a CBDC, interoperability with other stores of value (e.g., commercial bank deposits, e-money etc.) would play an important role in strengthening the domestic payment ecosystem and reinforcing the role of central bank money. Sustained collaboration between public and private sector participants will be critical to delivering this interoperability. Mastercard is supportive of the Federal Reserve's proposed intermediated model (two-tiered) approach to a CBDC (provided development of a retail CBDC is deemed necessary), which will ensure that the Federal Reserve System retains strong institutional governance over the core CBDC infrastructure. This model will also facilitate the engagement of the private sector in the competitive development of innovative payment interfaces and use cases that allow transferability across multiple payment platforms. An intermediated (two-tier) model would allow participants to use networks to store, move, and transact CBDC. This would prevent lock-in risks and allows CBDCs to become

accessible to retail customers as they flow across multiple networks.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

We do not believe that it is possible to determine the future technological innovations that may affect the design and policy of CBDCs. The continued digitization and miniaturization of payments, driven by increased e-commerce and the rapid evolution of parallel technologies like 5G, means that the future of payment systems will likely evolve in unpredictable ways.

Therefore, we recommend that the design of a CBDC should be structured to embrace the necessary scalability, extensibility, and flexibility to accommodate a rapidly changing payments landscape. The Federal Reserve's preference for an intermediated (two-tier) CBDC is an important first step in achieving that structure, as it provides the flexibility to add new issuance and distribution mechanisms without requiring the Federal Reserve to design and deploy those capabilities itself. The participation of private sector intermediaries allows the central bank to deploy incentives for the continuous innovation in new payment capabilities that will be required in order for a CBDC to remain relevant.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

We focus this response on potential approaches to navigating the challenge of facilitating offline CBDC transactions, while at the same time supporting an 'identity verifiable' CBDC. Certain 'token-based' CBDC implementations may have the potential to enable low-risk offline CBDC transactions, however, the bearer nature of these assets' risks providing bad-actors with an improved set of tools for the facilitation of financial crime. One approach to this challenge might be the creation of two forms of a CBDC with differing technical characteristics: a primary "account-based" system and a secondary "bearer token" narrowly designed to facilitate offline payments. The relationship between these two forms could be structured to "nest" the bearer token within the account-based system. Under such a framework, users could be required to first onboard to the primary account-based system—undergoing all necessary KYC checks—before having the right to either convert their account-based holdings to bearer tokens or receive bearer tokens from a third party. When combined with technical solutions to limit individual holdings of bearer tokens and the size and frequency of an individual transfers of bearer tokens, this framework could ensure most CBDC deposits would remain in the primary account-based system linked to the verified user's identity. An alternative, and significantly simpler, approach to reconciling these policy objectives would be to deliver offline payments as a value-added service, with risk underwritten by supervised private intermediaries, rather than as a feature of the core system. The handling of offline transactions by card-based ecosystems today provides a model for how this could be accomplished by using a combination of technology and business roles to define liability and limit exposure. For example, Mastercard uses counters on the payment card chip to manage the risks of offline payments. These counters can be set to allow offline transactions only when the number of offline transactions is below a threshold. These risk parameters may be set at a regulatory level or based on individual issuer risk tolerance. This allows the convenience of offline transactions for consumers and merchants at a manageable level of risk, acceptable for all entities in the ecosystem. Within the context of the CBDC, this second approach would have the benefit of simplifying the Federal Reserve's ability to deploy policy tools—such as limits and tiered remuneration—and obviating the need to develop costly parallel infrastructure to enable a bearer token that operates parallel to the primary account-based system.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

There is no point in implementing CBDC while cash is still around. It's about as useless as issuing a \$1 coin while still keeping the \$1 bill in circulation. The main benefits of CBDC are inherent in its displacement of cash: AML, physical hygiene (think of the anthrax scare), and the ability to create negative interest rates, if needed for monetary policy purposes.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

If CBDC displaces cash, it could always offer interest rates lower than bank rates. This would keep most deposits in the banking system. CBDC could also employ tiered interest rates, with deposits under a certain threshold receiving more favorable terms.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

No.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

14. *Should a CBDC be legal tender?*

I think you misapprehend "legal tender." It is an extremely narrow commercial law doctrine, akin to hindrance. It permits refusal, and merely means that a refused legal tender will substitute the original debt with a clean new one: stripped of any consequences of default appurtenant to the original debt. Herman Oliphant, *The Theory of Money in the Law of Commercial Instruments*, 29 YALE L.J. 606, 609 (1920). Courts are indulgent toward non-legal tenders. W.F.K., Note, *The Requisite Medium in a Tender of Performance of an Obligation to Pay Money*, 76 U.P.A.L.REV. 433 (1928); *Simmons v. Swan*, 275 U.S. 113, 116 (1927). Legal tender only had monetary significance in the days of the gold standard. Even this monetary significance was limited until the abrogation of the gold clause.

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

I have already answer this, above.

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

No. Tiered interest is a better solution. AAA companies will not want to hold liquidity with A+ banks, but already use the repo market to do so. This drains collateral from the system.

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

A) The potential benefit of CBDC that your white paper failed to address IS its PRIMARY potential benefit in my view. This benefit is that, initiated as part of systemic monetary reform legislation, CBDC can and will replace existing bankmoney (that is, dollar-denominated means of payment created by commercial banks through account entries whenever they make loans) and function alongside US coins and paper notes as our US money, a public liquid asset. Congress should never have ceded to commercial banks its Constitutional power and responsibility to create money, as it did in 1913. But Congress today can and should reclaim its authority to create US money, not, like now, as a liability, but as Money, our public liquid asset, in amounts determined by an independent monetary authority established within the US Treasury (or as a 4th branch of government if we ever choose to update or amend the US Constitution thusly), and transition us seamlessly to this sovereign, public, Just Money system in a timely and orderly manner. There is much literature already on this by authors such as Steven Zarlenga, Joseph Huber, Richard Werner, Saule Omarova, Thomas Mayer, Kaoru Yamaguchi, and many other scholars. B) Achieving the major policy change I identified in A (to institute CBDC as part and parcel of monetary reform legislation like that introduced in 2011-12 in H.R. 2990, which has recently been updated for 2022-23) will correct a systemic flaw that has fueled an exponential growth imperative and impeded equity, sustainability, flourishing, and peace for all people ever since double-entry bookkeeping and power-relations gave rise to modern money and banking 1200s-1900s. That flaw is the creation of money as private-interest-bearing debt, as a liability. Even your own definition of CBDC as "a digital liability" reflects, and threatens to perpetuate, this conceptual and practical flaw, which has been critiqued since the 2007-08 crises by authors such as McMillan (2014, *The End of Banking: Money, Credit, and the Digital Revolution*), Huber (2017, "The Case for a Central-Bank Currency Register," and Kumhof et al (2020, "Central Bank Money: Liability, Asset, or Equity of the Nation." I encourage you to rethink your definition of money. Doing so is not merely a conceptual or semantic matter. It is a policy matter of how to create and account for Money—whether digital, coin, paper, or on account—as a public good, a public liquid asset. Achieving that conceptual, legislative, and accounting shift has vital practical and material consequences in the real world, economically, ecologically, socially, geopolitically. Then CBDC, or public digital or crypto currency, can be a digital asset of our public central bank or nation that is widely available to the general public. In this respect, it will be analogous to coin or paper money. It will differ from digital money available to the general public today because a CBDC, AND all the coins and paper bills fungible with it, will then be central bank or US money, a public asset, rather than a liability of the Fed or a commercial bank, and there will be no more bankmoney created as debt. The general public think of money as an asset, which it is for most of us. Our money is hard-earned through our labor to produce goods & services for market and to earn enough to pay our bills. Why not comport our money system with what people already believe is the case, rather than maintain our flawed, mathematically- and physically-unsustainable existing system that serves the private commercial banks, and their shareholders and other beneficiaries in the finance elite, at the public's—both people and government—and planet's expense? C) Potential risks unaddressed: Establishing CBDC within our existing Federal Reserve System and without ending commercial banks' privilege to create out of private-interest-bearing credit what we and our government use as money will not only miss this historic opportunity that we have to do good, not only for our own children and grandchildren, but for posterity. It will also further entrench and exacerbate the instability, injustice, unsustainability, extractive destruction of

people and planet, and geopolitical warmongering that the current money system causes not only in the US economy and society but also those of other countries. If the Fed truly exists, as you say, "to promote the effective operation of the U.S. economy and, more generally, the public interest," then making CBDC part and parcel of full monetary reform is the best and, I believe only, way to achieve that mandate in the 21st century and beyond. Another potential risk is the "narrower-purpose CBDCs" that you suggest "could also be developed, such as one designed primarily for large-value institutional payments" (fn #19). That would further entrench our existing bankmoney system and the power of the banks it serves, and disenfranchise the People more than we are today. I do NOT support this.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

As I indicated in response to #1, the potential benefits of CBDC that your paper identifies (pp. 14-16) and I support (broad public access to public digital money and to payment services free from risk; improving cross-border payments and interoperability within and across national currencies; cost-effective financial inclusion) can best if not only be achieved when ALL our money—digital/crypto, coin, paper—is sovereign or public CB money. That is why systemic monetary reform must be the basis upon which CBDC is introduced. It is not too much to do both at the same time; in fact, both will work best that way. Then we need not even call it CBDC, but simply US money, whether digital/electronic/crypto, coin, or paper. The essential thing is that it all is publicly created and modulated as the sole US legal tender in amounts in sync with our productivity so that its purchasing power stays stable over generations. You suggest that a benefit of CBDC is "to preserve the dominant international role of the U.S. dollar" (p. 15). I do not think the dominance of the US dollar, established after WWII, is or was ever good for the American people, not to mention other peoples. It was only good for the banks and financial elite, in the US and globally. So, I do not want CBDC that has this as a goal. Nor do I want us to establish a US CBDC, not to mention to rush to do so, simply because other countries are doing so and the US corporate and financial elite fear losing THEIR dominance and power to extract surplus value and natural resources not only from people and planet in the US but all around the world. That is economically and ecologically unethical, unstable, and unsustainable. Young people today will not stand for this. Neither do many of us adults and senior citizens.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

I appreciate your stated concern for "economically vulnerable households and communities" and "underserved and lower income households" (p. 16 & Appendix A). In fact, I attended some of your FRBs' "Racism and the Economy" series in 2020-2021. But, with all due respect, to me it all feels like window dressing or lip-service unless CBDCs are part and parcel of sovereign Just Money reform. If not, it is nothing more than another instance of using 'service to the poor and marginalized' to get through a change that, in fact, serves the financial elite at everyone else's expense, most especially that of lower income people, who ONLY pay for our money system (by earning NO interest while paying interest through the price of everything they buy). Thus, it is up to you and Congress, or else a movement of We the People, whether the CBDC we get is a net positive or net negative change. I am working 100% for a net positive effect for all (except, perhaps, the 1%). I also appreciate and firmly agree with your clear commitment (p. 16) NOT to do away with all physical money (coin & paper) in the process of introducing CBDC or digital US money. Even if the seigniorage earned from coin and paper money is less than from account/digital money (though you/we must factor in the cost of electricity and water to keep computer servers going, and raw materials to make the equipment) and even if more and more people use digital currency more of the time, doing away with physical money will exclude some from the market and hinder inclusion. Thus, we must retain some physical currency for inclusion and in case of rolling blackouts. Already today it comprises under 7% of our money supply, so, unless our electricity grid is seriously interrupted, we are unlikely to need more than that. Finally, if you and Congress institute US CBDC while leaving commercial banks free and expected to create our means of payment in it and interchangeable with coin and paper notes, it will be extremely worse for equity and inclusion. Doing that will entrench the money power in commercial banks' hands for the digital age, missing the opportunity this moment in history affords us to supersede modern bankmoney in the name of justice, democracy, and sustainability for all people and all life we share this planet with, now and for posterity. If you and Congress do so, it will be because of the role of "money in politics," and I don't know how any of you can, while so doing, look your children and grandchildren in their eyes and tell them that you love them and assure them you care about all children. Whose interests are your efforts at and research on "financial inclusion" going to serve if you leave private parties with the privilege and authority to create our means of payment through interest bearing debt?

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

I agree the goals of maintaining price-stability and satisfactory and sufficient employment for all adults up to retirement age so as to secure all citizens survival and flourishing from birth to death are what any and every (public) Central Bank or Monetary Authority exists to achieve. As you at the Fed surely know but seldom if ever admit, the Fed's means for achieving price-stability and full employment are limited because you do not control the money supply. The commercial banks, not the Fed itself, create the money supply for the public. I imagine this lack of control or direct influence is very frustrating for you, at least if you believe you exist, as you say, "to promote the effective operation of the U.S. economy and, more generally, the public interest." Some say your work is like "pushing a string." In any case, to answer your question, creating CBDC as a side-by-side option leaving commercial bankmoney in place might be somewhat effective in warding against the encroachment of 100% private cryptocurrencies and so-called "stablecoins" on our money system by becoming "money-like," which will be an even more unregulatable and insane state of modern banking than we already have with shadow-banking and MMMFs. But it will do nothing to help the Fed achieve its monetary policy goals. To believe and to assert it will help is to sell yourselves or the public a bill of goods, and I have to tell you this public isn't buying it. If you are serious about your professional responsibility not just to pursue but to maintain full employment and price-stability (that is stable-value money, where the purchasing power stays steady or ever-so-slightly improves over time, with time as in generations not merely months or years), you must pursue CBDC only in the context of full monetary reform such as that laid out in the 2011-2012 NEED Act (HR 2990), which is almost done being updated as the American Monetary Reform Act (AMRA) of 2022. In implementing monetary reform such as that laid out in AMRA and by Huber, McMillan, Omarova, AMI and AFJM, the Fed will become a wholly publicly owned and independent unit within the Treasury. The goal of price stability over months, years, and generations will be, with due diligence, attainable with digital US money (so-called CBDC) a good, necessary, and majority part of our US money supply. And the definition of "maximum-employment" can be corrected to mean (1) everyone who is able (2) works a gradually decreasing amount of minimum hours/week for (3) a just wage given (a) the amount of preparation needed to do that job well, (b) the societal need/demand for that work, and (c) the physical demands of the job, and (4) has a gradually increasing socially-guaranteed number of hours left over to participate in the gift economy whether within or outside their job.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

--Again, if you shift to a public "currency register" (Huber, 2017) or "People's Ledger" (Omarova, 2021) in the process of introducing CBDC or sovereign digital US money as part of 100% public money supply, ending banks' creation of money out of interest-bearing credit/debt, it will be a net positive for financial stability. The more we all get accustomed to this new money system, the more stable it and our economy will become. In this public, sovereign, just money system, money will be wholly in the public sector, a liquid public asset that lubricates our just and sustainable exchange, and the supply of which can be modulated so money's purchasing power stays stable. In this system, credit (saving and lending/borrowing, and investing) will be wholly in the private sector, where financial companies must sink or swim without public propping up, just like any other service sector, and regulated no more or less than any other producer of a good or service for the marketplace. --If you establish US CBDC while leaving commercial banks with the legally sanctioned privilege and responsibility to create most of our means of payment denominated in US \$s, it will be a net negative for stability, financial and otherwise, for people and planet in the US and everywhere. Other private entities like FB with its Diem, cryptocurrencies, crypto exchanges like FTX, Amazon and other corporate giants w/ whatever so-called "stablecoin" they each come out with -- these will surely encroach upon whatever semblance of a public sector money we have left under such a CBDC-bankmoney regime. It will be anything but stable financially, economically, politically, and geopolitically. As McMillan makes clear in their 2014 book, The End of Banking: "In 2008, we were taken by surprise. We believed that there was no alternative, so we kicked the can down the road and kept a dysfunctional banking system on life support. We now know better: There is an alternative. It would be a shame if we were not prepared next time. Let us not waste another financial crisis: We can do better than banking" (p. 180).

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

--If CBDCs are introduced as part-and-parcel of a shift to public/sovereign/just money, it will take away the artificial propping up of the current financial sector. Investors will then have to

practice what they preach, and bear the full risk of their investments. Savings and loan service providers will too, as will those who expect to protect the purchasing power of their time deposits, not to mention earn any interest or dividend for letting others be productive with that money during the time they don't need it. --But if CBDCs are introduced alongside and fungible with bankmoney, it is a recipe for financial and economic instability, injustice, and entrenchment of the power of a wealthy elite (and those who do their bidding in the halls of Congress) at the expense of everyone else in the US and—if but only if the US maintains the hegemonic global power of the US\$ (which is a big IF anymore, I'm afraid to tell you, no matter how big our military might is)—at the expense of everyone else around the world except for other similarly positioned wealthy elite in other countries. --Finally, money 100% publicly created as our liquid asset and medium of exchange is systemically different from bankmoney or "special drawing rights" and from any other privately created money-like something called "stablecoins" pegged to bankmoney denominated in one or more national currencies. Stablecoins are a contradiction in terms because they are no more stable than the currency or currencies they are "pegged to", and they are just as private as is that bankmoney, which itself is not legal tender *de jure* but only *de facto*. So-called "stablecoins" are an unnecessary, undemocratic element in our payment clearing system, but spawn from the inherent logic of our private bankmoney system. Any "stability" they have or might gain is owed 100% to the public-backing and legal sanction they buy politically, and they will make our bankmoney system even more vulnerable and less stable than it already inherently is. It is a travesty of democracy that, together with the FDIC and the Office of the Comptroller of the Currency, a President's Working Group on Financial Markets" (PWG) gathered 17 private players ("market participants") and a set of "experts and advocates" and trade associations representing the finance sector to study and brainstorm on this, resulting in the Nov 2021 Report on Stablecoins. We need public sovereign Just Money, not more private players getting in on the bankers' deal at the people's expense. --All the risk and fret of risk that you discuss in Appendix A, pp. 7-9, and elsewhere, can and should be avoided by making ALL money be CBM, that is public, sovereign US \$-denominated money, whether it is digital, coin, or paper. It all, and only it, should be the sole and unitary legal tender in the US. Banks and other peer-to-peer lending or investment firms can and will continue to exist as service providers of transaction, savings, and loan services, functioning as intermediaries for—rather than private creators of—our US money. This should be what you mean by "intermediated model" (pp. 2, 13, 14, 15).

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

--Application of the "systemic solvency rule" in the accounting balance sheets of ALL companies, both banks and nonbanks, financial and nonfinancial (see McMillan, 2014, ch 9). The systemic solvency rule requires that "the value of the real assets of a company has to be greater than or equal to the value of the company's liabilities in the worst financial state" (p. 147). Combined with the separation of money into the public sector and credit into the private sector, application of this rule will effectively end the creation of money out of credit once and for all companies. --Recognition conceptually and in accounting practice that money, *sui generis*, is a public liquid asset not a liability. --Implementation of NEED Act/AMRA procedures, including establishment of (1) a Revolving Fund into which principals of all loans in existence on the day the law goes into effect are paid through to as those loans are paid back; (2) an independent public Monetary Authority w/in the Treasury (or eventually—through a Constitutional amendment or a Constitutional Convention to draft a new constitution—as a 4th branch of government) whose task is to modulate the money supply so as to keep the value (purchasing power) of money stable over time and whose power includes the monetary policy tools of unconditional income and demurrage charge to inject or withdraw money from circulation solely as quick-turn-around monetary policy measures; (3) full bailment for transaction accounts, and recognition that FDIC-like insurance for banks is not needed nor even helpful beyond the 5-10 year transition period; (4) pass through to state and local governments of at least 25% of any and all new money injected annually. --Establishment of National Investment Authority (NIA) as an entity, preferably under the authority of the House of Reps rather than the Treasury, to implement long-term investment and lending for the public good, as democratically determined, of money in the revolving fund and any new money issued and appropriated to it by Congress, all within the quantity bounds set by the Monetary Authority. --Implementation of a Congressional practice or entity parallel to the NIA for taxation policy that determines how much taxes to require from whom and to pay for what internal functions of government, and to pay for which public goods, as democratically determined. --Establishment of protocol by which the independent public Monetary Authority can enact the monetary policy tools of (1) an unconditional income to inject new digital currency into circulation and (2) a demurrage charge to withdraw money from circulation, each to be enacted solely as monetary policy measures. Whenever enacted, the former is to be injected into the transaction account of each and every citizen and legal resident in the US. The latter is applied regularly and only to that portion of transaction account balances

that exceeds a publicly established cushion above each account holder's average monthly expenses for the prior 18 months.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

--Physical cash (coin and paper notes) should NEVER be entirely eliminated. Its quantity in circulation should always be kept in sync with people's usage of it, and the Treasury should help to avoid but be prepared with sufficient cash for possible emergencies that take the internet or electricity grid down. --Absolutely, the general public should always have access to CBDC (or US digital money) that can be widely used for payments. What else is it or would it be for, actually?! --I suspect here you are referring to the "narrower-purpose CBDCs" that you suggest in footnote #19 "could also be developed, such as one designed primarily for large-value institutional payments and not widely available to the public" (p. 13). As I noted above, I am opposed to such an idea. A limited-access and narrower-purpose CBDC can only benefit the existing privileged beneficiaries of FR bankmoney system, namely the commercial banks and their shareholders, with the former also being the shareholders of the 12 FRBs.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Domestic and cross-border digital payments will evolve, whether or not the US is participating via a CBDC. We have long-since been involved in domestic and cross-border digital/account-based payments and check-clearing systems with respect to existing bankmoney, which, although fungible with US dollar-denominated coins, bills, and reserves and denominated in US dollars, is all privately created as interest-bearing debt. If the US and other nation states do not develop CBDCs, wholly privately-created money-like instruments will gain more and more traction, and the idea of them as "stablecoins" tied somehow to one or more national currencies will too, even though it is simply a farce or charade even if they get legally sanctioned as such. Of course, bankmoney is charade too, it's just all we have as money. It's the money system that Congress established in 1913 for us to use, and we've let every Congress since leave it in place, at times (1933, 2007-08) shoring it up and at other times (1999, 2019) weakening it. What Congress does in 2022 and beyond, you Governors of the Fed can influence for the better, and so can monetary reformers. Establishing CBDC within the existing Federal Reserve bankmoney system is likely to prolong the US monetary union slightly longer than it will last without any US CBDC, and it will enable the US (and its wealthy citizens) to play differently among other nations or monetary unions with CBDC. But doing so will not result in stable, just, or economically viable domestic or international exchange relations, not to mention ones that serve ALL the peoples whose names the various currencies bear. Only establishing CBDC as part of monetary reform within which CBDC and all forms of our nation's money are solely and wholly publicly created and modulated will enable us to achieve financially and economically stable, just, sustainable societies within which democratic practice and cultural diversity can flourish. Let's do that! Together!

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The US should attend to its own physical, environmental, social, economic, political, and cultural well-being and stop trying to dominate the world through our monetary and military might as we have done since WWII. We should not rush into CBDCs simply because we are afraid of too many other countries doing so first. We can learn from others' experience with CBDC, if they develop it first. But we should not wait around for others to go first either. There is enough information out there for us to study and learn our way, to take our time to get there, and not to fear we will lose out. We need a world without war, hegemonic powers, autocrats and oligarchs and plutocrats. We need to start taking climate change and the end of dependence on fossil fuels seriously NOW. In TEN more years it will be too late. We need to end the dominance of the military industrial complex and guns in our domestic and international relations. We need to get money out of politics, and we cannot do so within our existing money system. We cannot do any of these necessary goods within our existing FR and bankmoney system. Introducing CBDC as part and parcel of this existing money system will be a travesty, and it will not achieve any of the stability, full employment, and sustainable economy and economic development priorities that you profess and for which you, as the US central bank, are or should be accountable.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

By establishing a National Monetary Commission, both in Congress and in counties or

municipalities across the country, to educate and discuss CBDC and reforming our money system to be 100% public, we would avert many potential risks associated with introducing CBDC without such public education, inquiry, and debate. The membership of Alliance For Just Money has ratified a Resolution for such a NMC, which you can read about here: <https://www.monetaryalliance.org/resolution-number-one/>. It seems like this would only make sense to you too given that you state: "The Federal Reserve will only take further steps toward developing a CBDC if research points to benefits for households, businesses, and the economy overall that exceed the downside risks, and indicates that CBDC is superior to alternative methods. Furthermore, the Federal Reserve would only pursue a CBDC in the context of broad public and cross-governmental support.... The Federal Reserve will also conduct targeted outreach and convene public forums to foster a broad dialogue about CBDC." (p. 21). I commend your commitment to community-based research, dialogue, and upholding the public good, but I can only hope that you mean it. If you do, I expect to hear from you directly as I am prepared and positioned to help you to reach the public for such forums and dialogue.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

By having all money—whether in the form of coins, paper bills, or digital units of account—be publicly created and, if need be for monetary policy reasons (i.e., to keep the purchasing power of money in circulation stable), publicly extinguishable (via bonds or demurrage or possibly taxation), every unit in circulation can be accounted for on a "currency register" (Huber, 2017) or "People's Ledger" (Omarova, 2021) and each unit, no matter its form, can only ever be one, and only one, place in the economy at any given moment. But it can and, as money, it should keep circulating to lubricate myriad exchanges of goods and services, including via loans, forever. Such money can be both transparent and private with blockchain technology—IF that's environmentally scale-up-able energy- & water-wise, which I doubt—or I'm sure some other privacy technology is being or could be developed. We don't need much currency to be physical, but some should always be physical, and if we go to rolling blackouts or huge cyberattacking, etc., more will need to be physical. And physical currency facilitates anonymous use. Finally, "illicit financial activity" is induced by the moral hazard inherent in the creation of money out of credit. If we do away with that practice, we won't eliminate all illicit financial activity. But we will eliminate its systemic cause, and that will give education, ethics, fellow-feeling, the golden rule, and scout honor (i.e., leaving the campsite or world better than you found it, rather than even more trashed) a fighting (or peaceable) chance!

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

--We can foster money's operational resiliency by employing the monetary logic of a "currency register" (Huber, 2017) or "the people's ledger" (Omarova 2021) and of money as a public good, a public asset franchised to all the people, and their companies, whose name it bears and commerce it circulates. --Cyber risks? They are inherent in and caused by our modern money system, whatever else incidentally may motivate them. If we eliminate the dehumanizing, exploitive, profit-maximizing motive from our monetary system and geopolitical relations, people will be less systemically instigated to engage in cyberattacks and warmongering and warfare in the world. Human beings will never eliminate conflict from our social relations, but we will lessen the amount of it and be better able to change how we respond to it IF we understand and eradicate the systemic root of the problem, negating the negative by superseding the flaws—the debt-based and private-interest-bearing traits—built into our money.

*14. Should a CBDC be legal tender?*

Yes, but it and US minted coins, printed bills, and publicly created units of monetary account should be our SOLE unitary legal tender. Once public money becomes the law of this land, no longer may banks create means of payment denominated in dollars and lent into circulation and accepted by the government as if it were legal tender. In other words, IF it is part and parcel of sovereign, public, Just Money reform legislation, then absolutely yes, CBDC along with coins, paper notes, and any other publicly created unit of account denominated in US dollars and should constitute our legal tender, our most liquid asset. Falling short of that, CBDC should only be instituted in a way that is compatible with and that helps lead us to systemic monetary reform. That means that CBDC, along with US coins and dollar bills, must be publicly created and accounted for as a liquid asset that comprise our sole and unitary legal tender, with (1) CB/US money accounts accessible to all US citizens and documented residents, (2) all seigniorage going to the public sector, and (3) CBDC replacing reserves—that is, the CBM that only Federal Reserve Account holders (mainly commercial banks whose interests the FRS was designed to serve) have access to today. As such CBDC

will have to compete against commercial bankmoney. But CBDC will win out in the end because it can better serve the public interest, economic and ecological good, educational, physical, and cultural well-being, and democratic practice of the people whose name it bears and commerce it lubricates.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

--In its origination and injection into circulation, no, CBDC should NOT pay or earn interest. It should originate as a public asset that is spent, given, invested, or lent interest-free into circulation for the public good. That public good is the interest that it serves. All seigniorage gained through its creation and first use must serve the public good. Any interest attached to its origination would fuel an unnecessary and unsustainable growth imperative in our economy. That is what we've increasingly had since the 1300s and it has led modernity into the climate, ecological, and geopolitical catastrophes we suffer more and more from today. Sure, there have been technological and scientific innovations along the way. But human ingenuity and a public money system in a market economy and democratic society would have led to them sooner or later anyhow, but with less damage and exploitation and with all justly benefiting along the way. By eliminating interest from the origination and first use of money, we can live our way into a sustainable and just postmodern age. It's about time! --That said, if and when for monetary policy reasons, a positive or negative rate of interest is needed to modulate the amount of money in circulation and to keep it CIRCULATING, then interest could be attached by the Monetary Authority to CBDC in transaction accounts. There must be proper warning of any rate change; not long ahead, but long enough for people to make decisions, which decisions are the very reason for the rate change, perhaps making the change unnecessary or necessary to a lower or shorter extent.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

There should be a level set—say a balance of \$3000 above a transaction account holder's average monthly expenses over the past 12 or 18 months—above which a demurrage charge is applied. Account holders know they can avoid this "parking fee" by shifting their excess funds to an investment account or a time-deposit savings account. The latter is not in bailment and, once we are beyond the transition period, no longer insured with FDIC-type insurance, or else we don't adequately remove the moral hazard from the system. But removal of FDIC insurance should not be immediate, as people have to learn from experience how a debt-and-interest-free, inflation-free public money system works before they will understand and, thereby, trust what money as our public liquid asset or unitary means of economic exchange is and how it works. But there need be NO quantity limit to how much CBM or US money someone can earn and how much of it someone may choose to invest—at risk to those funds—for whatever they deem to be credit worthy goods and services.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

--Payment service providers, whether public or private, physically located in the geographic US should be the ones to provide transaction account holders with income and payment services with respect to CBDC, coins, paper bills, and units in transaction accounts denominated as US dollars. --Private savings-&-loan institutions, peer-to-peer lending platforms, and financial institutions we currently know as commercial banks can all provide savings and loan or investment services, thereby serving as intermediaries for CBDC. But in so doing none of them will have the privilege to do the main thing that banks now do and benefit freely by (namely to create money out of credit, private-interest-bearing credit). They will simply provide for a fee intermediating savings and lending/borrowing services and/or investment services for prices that revolve around the average cost of providing such services.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes, transaction account holders can and should be able to keep limited amounts of CBDC off-line on smart cards so as to be able to make digital purchases for basic living even when the internet &/or electricity grid is down (though of course local merchants would have to have some kind of solar, wind, or generator power to do so). A digital transaction using an offline and/or off-grid method would store the transaction record with sufficient and traceable identify verification at the point of sale for the transaction to be made without the payment being fully cleared until the internet and/or electric grid comes back on. It does not seem like a big deal or a technological problem to achieve this. Having some physical cash still in circulation will help in such times too. Indeed, the days may come when we may need to have printed and hand-written ledgers on-hand to be prepared for interrupted or unstable internet or electricity access for any number of reasons or disasters, manmade and seemingly natural.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

--Of course. Again, it can be done via a smart card similar to what is already common in credit and debit cards. --We could also develop international CBDC smart cards that can make payments in a diversity of sovereign currencies across national borders. --And we can develop national CBDC smart cards that allow for in-person payments in CBDC and/or a diversity of state or municipal local public currencies (like those in Ithaca NY, Tuscon AZ, Berkshires MA), if and as more of those sprout to encourage and protect local investment and development in, by, and for depressed communities or regions.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

We can and should have one national “People’s Ledger” or “currency register” upon which every public and private payment platform depends and into which each is integrated as long as it remains effective and efficient for its end-users. People’s, companies’, and units of governments’ transaction accounts should be publicly administered on the inside, with the existence of every unit of money (whether coin, digital, or paper) in circulation registered and clearing therein as it circulates, while multiple public and private providers will interface with households, businesses, and local governments to provide them with transaction account services with privacy and security protocol intact and within an appropriate competitive regulatory framework such as exists within every industry and service sector. Savings and loan platforms and investment companies should be wholly private, also with privacy and security protocol and within a competitive regulatory framework to dissuade against monopolies and cartels etc.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

If and when we manage to eliminate the artificial, unjust, and unsustainable propping up of the financial sector that occurs by Congress allowing and enabling private companies called banks to create our means of payment denominated in US dollars, all commercial companies and corporations will have to innovate to survive. But they will be able to do so at a sane, humane, and natural pace guided by genuine need for innovation in order to produce a better or less costly good or service. That’s another reason why the introduction of CBDC must, must, must be part and parcel of public monetary reform. Such reform will put our money system in sync with how people think it already is, and make it and the financial sector (of savings, loans, and investments) far simpler and easier to understand and to participate in—therefore becoming much more accessible/inclusive—AND more effective. All private companies, businesses, and corporations, including banks and insurance companies, agriculture, manufacturing, and all manner of commerce one can think of will then exist within a competitive market economy to achieve better goods and services. To survive in the marketplace that serves both the private and public good, companies will have to factor in ALL aspects of their production, rather than merely maximizing shareholder profits at the expense of everyone one and everything else that they can get away with shortchanging. They will be able to recognize and give credence to and stop polluting and exploiting the gift economy that we are all party to and intimately depend upon. Government can and will then, through our democratically elected representatives and judicial system, hold companies accountable not to externalize environmental and social costs of production on current and future generations so that adults in the room can start to repair, restore and regenerate the world leaving it all at least as good if not even better for our tomorrow’s children than what we were bequeathed.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

In addition to all the sovereign, public, Just Money references I have made or alluded to (and can happily provide many more citations for), I recommend you study, learn from, and consider the design principles of the 250 year old public banking system in Germany called Sparkassen, which Mark Cassell sheds light on in English in his 2021 Banking on the State: The Political Economy of Public Savings Banks. Sparkassen have an amazing design structure of banks limited to localities nested in regional banks nested in larger regions nested in the nation. Their design structure gives them the benefits of both decentralized groundedness in communities, with bank employees having deep local knowledge of, relationships with, and commitment to the economic players in that locality or region, and regional and centralized accountability and pooling of risks. It makes for a vibrant and

economically viable, humane, and ecologically responsive network of banks that predate today's neoliberal banking regime and that have not merely survived but thrived amidst it and, I believe, are best poised to know how to navigate our hopefully coming shift to a public, sovereign, just money system and to flourish amidst it. In conclusion, I want to commend you, the Board of Governors of the FRS, for recognizing that "the introduction of a CBDC would represent a highly significant innovation in American money" (pp. 3, 21), and that, "accordingly, broad consultation with the general public and key stakeholders is essential" (p. 3). Indeed, both are very true, and I greatly appreciate and applaud your consulting with the general public through soliciting these public comments. It has afforded me, organizations I work with, and obviously many others an opportunity to speak to you directly on this vital public matter at a potentially pivotal moment of history. I also have to ask, though, who are your "key stakeholders" other than that "general public"? And will you listen to them—esp. the Money Power among them who are the commercial banks, especially the behemoths among them—more than the real stakeholders: namely, the productive American people and, indirectly, productive people everywhere, and the vitality of sustainability of the planet we share? The possibility and fate of future generations of life on this planet rest to no small measure on how you, Board of Governors of the Federal Reserve System, answer that question. Know that we are watching. We encourage you to follow your professional ethics and your mandate as public servants, to think critically and historically, and to do the right thing, with courage, honesty, and integrity, and with humility and fellow feeling. Finally, the authors and literature cited above and much more you will find referenced if not also linked to in the 3-tiered bibliography under Resources at [www.monetaryalliance.org](http://www.monetaryalliance.org). Thank you, stay well, and Godspeed.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The paper should lay out specific policies related to financial and technology literacy. While the paper has discussed privacy issues in detail, the implementation of CBDC should ensure that surveillance capabilities for the government related to CBDC are constrained by current law. The paper should explore whether CBDC can help in ensuring compliance with current law related to the sale or purchase of outlawed goods and services.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

The community has pursued alternatives such as stable coins (USDC, USDT, DAI, etc) and Alliance Based Digital Currency (ABDCs such as Libra and its successor Diem were not successful). We believe CBDCs have the advantage of government sponsorship and therefore have less risks and volatility, provided they are backed by a stable, democratic form of government. While the potential benefits of CBDC on payments can be achieved through stable coin or ABDC, we believe CBDCs are likely to have greater adoption and stability.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

While CBDCs in particular and blockchain in general are expected to positively affect financial inclusion, this will not happen without a concerted effort to improve financial and technology literacy. Without such literacy, CBDCs can have a negative impact on financial inclusion.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

U.S. CBDC will greatly enhance Federal Reserve's ability to effectively implement monetary policy through the following: Provides programmable money to government, business, and retail users. Maintain a transaction database to track assets and transactions while not impinging on legitimate privacy rights. Control the policy for issuing CBDC assets. Monitoring assets and transactions for regulatory compliance purpose.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

A CBDC does not on its own positively or negatively impact financial stability. Positive impact will accrue by clarifying the role of digital currencies, creating a framework for innovation and integration, and the accompanying effort to foster financial and technology literacy.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

CBDC will adversely affect the financial sector if it changes the role of trusted financial intermediaries too drastically and without the appropriate rationale and literacy support.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial*

*sector? Would some of these tools diminish the potential benefits of a CBDC?*

As educators we believe the need to provide tools for the general population to learn about CBDC in particular and digital assets in general. The introduction of the educational tools needs to be accompanied by a nationwide campaign to reach all sectors of the country including hard to reach populations such as rural and minority communities.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

It is absolutely essential to preserve the general public's access to a form of central bank money in the short and medium term. Long term decision should be guided by adoption trends and the impact of efforts to improve literacy,

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Without the U.S. CBDC, some other countries CBDC, or cryptocurrencies offered by public or enterprise blockchains might evolve to fill the gap in the absence of a U.S. CBDC.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Blockchain technology is evolving very quickly, at a rate exponentially faster than what was previously observed with the Internet. The US is falling behind with CBDC and blockchain uses for financial systems and other business applications. Similar to the historical Sputnik launch, the U.S. needs to catch up by creating a framework for innovation and integration.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Blockchain has some technology related to privacy that can be leveraged by CBDC. These include state channels, mimblewimble, zero knowledge proofs. There might be some cryptographic research needed to implement privacy policy specifically for CBDC. We also need to fund cryptographic research for quantum computers.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Cybersecurity is a big challenge for centralized or decentralized systems. A blockchain based CBDC that ensures strong encryption and decentralization is likely to be more cyber resilient. However, the U.S. CBDC should consider the complexity of blockchain security for both single chain and multi chain systems. The quantum attack resistant design should also be considered.

*14. Should a CBDC be legal tender?*

Yes. Benefits associated with CBDC are only possible if it is legal tender.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

No. It will be best for CBDC to be treated as cash. Currently, cash does not pay interest. The banking sector can offer products and services for consumers to deposit their CBDC with them for interest.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

To ensure stability, this might be a good design consideration, especially since cryptocurrencies do not have such a limit and that can compromise their decentralization. However, this is against the spirit of the American system where we do not limit the amount of wealth a single end-user can have. We should consider limiting CBDC amounts in individual transactions, instead.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

To ease adoption it is important to minimize change. It will be best if the intermediaries continue to be retail banks within the current regulatory structure. Changes to intermediaries and regulatory structure should be explored post the introduction of the CBDC based on the success of literacy efforts.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes. This is important. Users may not be online all the time. For small amounts, having offline capability is feasible and required.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Allow CBDC to be exchanged with stable coins and other tokens at market rates. This can be done by cross chain interoperability through transforming CBDC to other tokens types that are programmable with blockchain applications.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Yes, this can be done by cross chain transfers. Multiple standards have been worked on by the : Enterprise Ethereum Alliance (EEA) Cross chain Interoperability Workgroup IBC (Inter blockchain Connectors) XCM (Cross Consensus Messaging)

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

CBDC can be designed as a fungible token or a hybrid token that is both fungible and non-fungible. CBDC should be designed as blockchain agnostic. CBDC transactions should be atomic transactions.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

A potential benefit, not considered in this paper, is that CBDC can provide a pathway toward ending bank creation of money altogether. Compelling reasons for ending bank creation of money have been given recently by Omarova (The People's Ledger) and previously by many others (See The Lost Science of Money, by Stephen Zarlenga.) In that way money creation through the Fed can become available to serve the needs of society as a whole. Banks can continue to meet borrowing needs by lending pre-existing CBDC. Money created by a central bank can be directed to meeting public needs. Another potential benefit of the shift from bank created money to central bank created money is that it could begin to address the extreme maldistribution of wealth that currently threatens democracy and social stability. New money created by banks goes to those who already have money; it concentrates wealth. Spending on public needs through CBDC provided to government has the potential to counteract wealth concentration by distributing the country's resources more evenly, and more justly.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes. Digital currency could be issued by the Treasury Department instead of by the Fed. New money could then be spent into circulation, as the greenbacks were, rather than being lent into circulation. That could bring the expansion of public debt to a close. It would have to be done with guardrails against government spending exceeding the capacity of the economy to use it for expanded production of goods and services.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

It could have a positive effect, but it depends upon how it is done. Automatic opening of Fed Accounts for everyone, plus access through the post office would certainly improve financial inclusion.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Monetary policy, via the setting of interest rates and open market QE, has never been very effective in achieving these ends. a) A CBDC which can be channeled into government spending in the public interest could certainly do a better job of keeping people employed. There is certainly much to be done that can be done by human power. b) Having the central bank actually control the money supply would do much to control booms and busts that are known to be accentuated by bank creation of money. Price stability is shaken by booms and busts, although it is also affected by other things. Central bank control of the money supply could potentially eliminate or at least attenuate the boom/bust oscillations, but it would depend on the ability of the government bureaucracy to be able to respond with adequate speed.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

As pointed out in #4 above, central bank control of the money supply could switch the money

supply system from being an unstable, positive feedback system to stable negative feedback system. In the current system of bank money creation, the money supply grows when growth is not needed and shrinks when it is needed – the boom/bust amplifier. Central bank control, done in partnership with the Treasury Department could reverse that and stabilize the system.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

The financial sector will have to change in response to introduction of CBDC. If money creation shifts from commercial banks to the central bank, banks will have to shift their business plan. They will have to shift to credit intermediation from credit generation, in the terms of Hockett and Oamarova (The Finance Franchise). Stablecoins are an entirely unsatisfactory basis for a money supply. Despite promises of staying linked to the dollar through risk-free investment in treasuries, they will go beyond it, just the Money Market Mutual Funds did. Stablecoins will have to be bailed out in the next crash just as the MMMFs were in 2008.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

During the transition banks from money creation by commercial banks to money creation by the central bank, banks may have to borrow from the Fed in order to sustain their liquidity. In the long run, investment money flowing into banks for lending on a credit intermediation basis will sustain liquidity.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

In the absence of a CBDC banks will continue operating their payment services, but other digital currencies will compete and are likely to destabilize the system.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The decision should be based on the fact that it will help the United States, not whether other countries are doing it. But if we don't move to have better control over our financial resources, we will fall behind. Credit guidance, that is, directions from the central bank over where newly created money goes, can play a major role. It was essential for the rapid recovery of Japan following WWII, as documented by Richard Werner in his book, Princes of the Yen, and for the rapid industrialization of China in the recent past decades.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Risk of change to financial-sector market structure. A non-interest-bearing CBDC is the way to go. A CBDC must function to protect the payment system, not primarily serve as an investment vehicle. Investments should reside in the private sector. CBDC must provide safety, not a profit source. Safety and stability of the financial system. It is not clear that limits will need to be placed on CBDC holdings, especially if the CBDC is non-interest bearing. Efficacy of monetary policy implementation. The real purpose of monetary policy is to determine how much money is in the system and how money is introduced into the system, i.e., who gets it. Currently the Fed does not control the money supply. It influences it by the setting of interest rates and open market operations, but these are weak tools. They are clumsy and imprecise. With CBDC money creation by banks could be halted and the Fed could actually control the money supply in the public interest.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Government needs to know financial information from individuals in order to determine if they are paying their taxes appropriately. Anonymity would only facilitate illicit activity. Powerful private companies already monitor how we spend our money. I see no need for anonymity. What is needed is more transparency, not less.

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

I don't have any expertise to offer here. It is an important question.

14. *Should a CBDC be legal tender?*

Absolutely. Without it being legal tender, you would just be playing games.

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

No. As stated above, a CBDC must function to protect the payment system and to protect the money used in the payment system by providing a safe place for money. It is not to function as an investment vehicle. Investments and profit-making should reside in the private sector. CBDC must provide safety, not a profit source.

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

This is not likely to be needed as long as CBDC accounts remain non-interest-bearing.

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

For CBDC to be inclusive, many intermediaries have to be involved, including post offices. As long as the contracts with the intermediaries are well written, it could be a variety of firms. Some provision will have to be made for them to be compensated appropriately for the work they perform as intermediaries. In the case of usage of private firms, the cost could be born by the individual holder of the Fed Account. In the case of usage of the post office or other public offices, the cost, if born by users, must be kept low.

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Probably not. This is a digital currency; that means online. Offline transactions can still occur using US bills and coins issued by the Fed and the Treasury Department respectively.

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes. Payment by check or electronic transfer should be made possible to convert one's bank money to CBDC. Use of debit cards should continue with CBDC.

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Different payment platforms will simply have to have their own CBDC accounts. As described by Hockett and Omarova, this occurs now with "peer-to-peer" payment systems in that these platforms all have their own bank accounts.

21. *How might future technological innovations affect design and policy choices related to CBDC?*

Technology does drive change, but it should not obscure the fundamentals of policy making in a democracy. The fundamentals are that we need a monetary system, free of special privilege, that serves all. We need a reliable and easily accessible payment system, but we do not need to optimize wealth accumulation by pandering to the needs of financial traders for ultrafast transactions.

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Design principles to achieve the potential benefits of a CBDC are the following: a. In shifting to CBDC money creation itself must shift entirely from commercial banks to the Fed, as detailed in The Peoples' Ledger. The payment system must come to reside wholly in an institution, like the Fed, which can offer the full faith and credit of the United States Government. The "tradeoff" here is that it will require a change in business plans for commercial banks, in which their lending will no longer be based on deposits, but will utilize pre-existing money coming into banks from savers as time deposits or from the Fed itself, if needed. b. The Fed must be enabled to fund the federal government directly with zero-interest loans, issued either in

perpetuity or with guaranteed, unlimited role-over privileges in order that government can meet public needs by spending in the public interest, limited, not by money, but only by the availability of labor and of sustainably available raw materials. c. CBDC accounts must be free of interest payments and be available to all who participate in the nation's economy. Access to accounts must be easily available through both private and public intermediaries, for instance through post offices, as suggested above, for those without internet service.

Further comment: The definition of a CBDC given in the 2nd paragraph of the Executive Summary of the Fed's document, Money and Payments: the US Dollar in the Age of Digital Transformation is inappropriate. It is an anachronism, a holdover from the age of gold-backed dollars, which no longer describes a monetary system of fiat money. There is absolutely no justification for regarding a CBDC a liability of the central bank. Rather it must be described properly as social equity (Kumhof et al. (2020)). These features of a monetary system, which can be utilized in the context of a CBDC, were put in the form of legislation and submitted to Congress in 2011 as the National Emergency Employment Act. The Alliance For Just Money ([monetaryalliance.org](http://monetaryalliance.org)) would be at your service for the fuller exploration of the ideas presented here.

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*Name or Organization*

Cresencia D Banzuela

*Industry*

Consumer Interest Group

*Country*

United States of America

*State*

California

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Is this another way of decoupling the US paper money which was decoupled from gold in 1970's that get us into 27 trillion dollar deficit . Is is backed by faith of US federal reserve that never balanced US budget . Is this digital currency will be used to wipe the trillion dollar deficit just by clicking the mouse ?

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Too much control by government , they could certainly freeze anyone's asset digital money just by opining against any politician policy . Central bank control not good for main st folks.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Totally negative, total control of people thru their money . I dont have cryptocurrency but now I understand what they stand for( away from central bank control)

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Price stability is the law of economics 101, supply and demand , too much of anything( dollar) not back by any asset is worth less just like writing bounce check for stimulus appeasement , the cotton paper where the money bill is printed on is worth more than the \$ 1 dollar itself.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

How could a bounced check( \$ dollar) converted to digital currency create financial stability. Now if that digital currency is backed by our gold reserve or silver , etc. then it is true stability , government spending within our means .

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Digital currency is just a digital equivalent of paper money , same concept of manual typewriter writing your documents now it is Word processor, reading encyclopedia now just surfing the internet . Head honchos of government need to learn economics 101, their policies destabilize the financial system, overspending beyond their means , no productivity in the government only issuing checks backed by taxpayers money , so they raise more taxes to finance their spending , vicious cycle since taxes is imposed in 1913.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

This digital currency should be back by gold or silver unlike the fiat money \$.

8. *If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Central control again. People should have control over their hard earned money .

9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Digital,currency is just a tool or representation of any trade transaction, it is the same repercussions of paper \$ dollars if not backed by anything except the taxpayers revenue . Neither the president nor yellen can back this up themselves , they are not the almighty.

10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Digital currency is bad if not back by any asset and will be used to wipe out the trillion dollar deficit in paper only , we will wait for the next great depression then .

11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Digital current should be back by gold or silver etc assets

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Should have this infrastructure of digital transactions perfected to maximum before embarking on this ? Of course there are technical issues it is electronic economics/ commerce/ finance after all.

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Cyber risks are inherent to this digital economics, same thing as paper money they can get burned or value inflated if they dont change the underlying value of the money tender .

14. *Should a CBDC be legal tender?*

Only if we go back before 1970's , digital currency backed by real assets not by debts.

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

Interest is set by federal reserves if they are doing a good job at it, of course CBDB will follow the market economics . Again it is a currency in digital form versus paper, same animal , if it look, walk and sound like a duck, it is a duck.

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

It is a currency for the benefit of the owner which are the taxpaying people as long as it is legally done. The limit of having money is dependent on one;s ability to earn it . Basic right in the pursuit of happiness , if people are happy with more money , so be it . Why set a limit.

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

As long as those firm and intermediaries are legal . Same concept like credit card , every time we use , intermediaries take a % off the transaction . It is a basic capitalism principle, everyone entitled to get paid for their work .

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Define when , what , how to use the off line capabilities to the people for transparencies .

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Should be like paper money. But dont take away the freedom of paying paper money from the any citizen, do not coerced , threatened or use their information data just get on board.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

This is technical and technological issues that should be tackled first and perfected. Same as coin mint and paper mills to create the money bills. Now with digital currency, it is easy just to click print money, easier to create fiscal debts and control the data linked to these digital currency.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

If your technology is not perfect yet, don't go into this not fully prepared.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Same analogy, what were the potential benefits when taxes were imposed and federal reserve formed in 1913, gold was decoupled from dollar in 1970's, we are \$ 27 trillion in debts, 8-9% inflation, highly paid but low productivity of employees. BTW : Don't track my email or reprimand me for this comment

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*Name or Organization*

The Citizens Bank of Clovis

*Industry*

Bank, Small or Midsize

*Country*

United States of America

*State*

New Mexico

*Email*

kcarruthers@cbcnnm.bank

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

For community banks we could lose deposits as our customers could convert their assets to the Feds CBDC thus reducing our ability to fund loans in our community.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

the payment system is working fine.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

I would think the only users of CBDC would be suffocated users. This would not enhance the situation for the unbanked.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

This would balloon the Fed's balance sheet and thereby distort its ability to effectively conduct monetary policy to control inflation and promote full employment.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

I don't understand how it would be positive and as noted above it would be negative.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

the Fed would become a direct competitor to community banks. Impossible to compete with the Government.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Don't establish CBDC.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

The payment system is working fine.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Our customers have never complained about cross-border payments.

*10. How should decisions by other large economy nations to issue CBDCs influence the*

*decision whether the United States should do so?*

It should have no affect.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

You have not made a compelling argument that CBDC would enhance privacy. There is a fundamental conflict between privacy and efforts to use a CBDC to prevent financial crime.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

No.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

How could this be accomplished?

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

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*Name or Organization*

*Industry*

Individual

*Country*

United States of America

*State*

California

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Dear FRB, I am concerned that the Federal Reserve does not consider how computers, telephones, credit cards via spamming are not secure transactions. All electronic funds have been hacked, to allow a persons life savings to be stolen by hackers with a CBDC will undermine trust in banks. I would encourage banks continue to use credit cards which are essentially a CBDC. The advantage of credit cards is the interest it earns on sales for the bank and the fact credit cards have credit limits, so a persons life savings are not depleted by a hacker. I would encourage banks to offer in person services at the branches especially for more senior customers that do not use electronic transfers. The number of branches may be reduced if needed for cost containment. The branches must be available for high dollar transactions where facial recognition and thumb print biometrics are required to reduce risk of theft.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

See above

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

See above

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

The mandate of the Federal Reserve is an oxymoron. If you have open borders how can the US have full employment? Can the US employ the population of the entire world? If you have full employment than prices are going to rise via inflation, how can you have price stability? Immigration must be managed so you neither have a surplus or deficiency of workers. It should not be used to lower labor costs by hiring undocumented foreign nationals over a countries own citizens. There maybe one exception to lower food costs where Industry cannot find local citizens to perform the work (agriculture). Migrant work permits can be issued so the US benefits from foreign low cost agriculture laborers without having the liabilities of granting them US citizenship.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

CBDC unfortunately will debase the currency faster than is currently being done. The reason Bitcoin is popular is the idea of a limited quantity. Bitcoin is not practical because it does not allow for expansion of currency, therefore there is no growth. The purpose of pegging the dollar to gold is like bitcoin, it limits the physical or digital creation of money. The banks can globally reprice gold and silver to 100% cover the M1 and M2 money supply. To expand currency further the price of gold and silver could be repriced at a globally agreed upon transnational rate. The increase in price of gold and silver price will allow for more currency creation as well as the amount increasing via increased mining production. Do not confiscate gold or silver. We need people to invest in gold and silver mines to increase the global

currency supply. Silver is a by product of other mining, so increasing the price of silver will allow more production of other metals.

6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?

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Bank credit cards

9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?

Some Chinese companies are defaulting on dollar denominated bonds. Instead of allowing for this default it may be a better to allow them to settle their debt in commodities instead of US dollars. It is better to receive gold, silver, copper, lithium, cobalt, nickel, etc. than receive nothing. If defaults occur it can set off a global collapse. The banks can then create a new commodities exchange to back the US dollar. Reference Zoltan Pozsar, Credit Susse, Breton Woods 3.

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Yes

16. Should the amount of CBDC held by a single end-user be subject to quantity limits?

In "Road to Roota" it states money is used to determine allocation of resources. The problem in a capitalist system is the danger of monopolies. Think of the game monopoly. When the game is ending one player owns all the property and the other players must constantly deplete their assets until they are bankrupt. Warren Buffet and other billionaires tried to encourage billionaires to donate all assets above 500 million back to society. I would like to see those assets used to create a sovereign wealth fund. The fund will allow all citizens of a country to own stock via the sovereign wealth fund and benefit as the country benefits. It may even pay dividends to shareholders.

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*Name or Organization*

*Industry*

Individual

*Country*

United States of America

*State*

California

*Email*

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See above

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See above

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*Name or Organization*

Deborah Hozempa

*Industry*

Other:

*Country*

United States of America

*State*

California

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Unconstitutional

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Unconstitutional

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Unconstitutional

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Unconstitutional Unconstitutional

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Unconstitutional

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*Name or Organization*

Morgan Warstler

*Industry*

Individual

*Country*

United States of America

*State*

Texas

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

It has to be programmable. programmable = public hosting public hosting = 1A FREE SPEECH say anything this is very positive. Free public hosting has MANY future benefits all wrapped around SAY ANYTHING.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

no

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

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*Name or Organization*

*Industry*

Individual

*Country*

United States of America

*State*

Texas

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

It's hard to escape from an abductor ex is you can't hide some paper money away. If my wasn't able to save money, I would've been stuck in an abusive relationship to this day. You will be trapping 1000s of abuse victims is you do this!

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

No!

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Negative! It hurts individuals and makes the weak vulnerable. It accelerates inequality!

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

It's continuing to put bandaids on a wound instead of replacing the bandaids and letting it heal

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

It will leave minorities and the vulnerable behind who do not have access to technology!

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

It will increase wealth inequality!

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes! Peolle who have no access to a bank or account will be left behind completely! Don't do this if you care about those in need

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

It devalues our dollar.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

No!

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

It leaves behind marginalized communities. It violates privacy, and it only benefits those who want to program and control victims.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Don't do it! It's not possible! It will hurt victims! I'm begging you!

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Corrupt governments have the potential to be in charge of them, so it's not gonna matter anyway

*14. Should a CBDC be legal tender?*

No!

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Don't do it!

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Don't do it!

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

None! You're gonna let corporations control us!

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

It's called cash!

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Don't do it!

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Don't do it!

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Don't do it!

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Don't do it!

---

*Name or Organization*

*Industry*

Individual

*Country*

India

*State*

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

THE KING SOLOMON POST OM SHANTI OM (LET THERE BE PEACE IN THIS WORLD) THIS IS SWISS/FRENCH/DUTCH/INDIAN/UNITED NATIONS/BRITISH INTERNATIONAL DISPATCH ISSUED FROM THE WORLD SECRETARIAAT/DESK OF LORD RAVINDER,(RABBINDER) KUMAR SHARMA (THE ROYAL CROWN/RA-UNCODE(THE SUN GODD-THE SUPREME POWER-THE HEAD OF STATES-THE ALIEN KING from outer space)/REXMUNDI/THE MASTER MASON CODE IS LAUSDEO/THE HEAD SUPREME COUNCIL OF EU@UN(uk)/I.E.F-IN/THE CHAIRMAN-UNESCO AND WORLD BANK,(IMF) FOR THE IMMEDIATE RELEASE OF FUNDS ILLEGALLY WITHHELD AND FROZEN FROM THE YEAR 2006 TO 2021-22 BY FEDERAL RESERVE BANK OF NEWYORK AC NO GOVT OF INDIA RESERVE BANK OF INDIA AND INDIAN BANKS NAMELY STATE BANK OF INDIA AC NO CENTRAL BANK OF INDIA AC NO NOW FROZEN PUNJAB NATIONAL BANK AC NO & AND OTHER INDIAN BANKS IN GROSS,VIOLATION OF FOREIGN EXCHANGE MANAGEMENT ACT 1999 AND ARTICLE 5 OF UNITED NATIONS UNIVERSAL DECLARATION OF HUMAN RIGHTS WHICH STATE THAT NO ONE SHALL BE SUBJECTED TO TORTURE WHETHER PHYSICALLY AND OR FINANCIALLY AND OR BOTH AND OR DEGRADED INHUMAN AND CRUEL TREATMENT TO WHICH I HAVE BEEN SUBJECTED TO FROM THE YEAR 2006 TO 2021-22 BY FEDERAL RESERVE BANK OF NEWYORK GOVT OF INDIA RESERVE BANK OF INDIA AND INDIAN BANKS RESULTING IN MY ACCIDENT ON 14/10/2019,IN SHIMLA HP INDIA AS A SUV OVERRAN ME CRUSHING ME ALMOST TO DEATH BREAKING THE BONE OF MY LEG AND NOW A STEEL PLATE HAS BEEN PUT IN THE BROKEN BONE OF MY LEG AND 3 TO 4 MISCARriages AND ABORTIONS OF MY WIFE WHO IS PRESENT QUEEN OF EGYPT FRANCE USA INDIA AND SCOTLAND(UK) CARRYING IN HER VEINS THE HOLY GRAIL AND HOLY BLOOD OF JESUS,CHRIST AND INVINCIBLE PHARAOHS FROM THE HOUSE OF LIFE EGYPT THE BOOK OF BREATHINGS AND FRENCH(ARCADIAN) ROYAL LINE FROM THE HOUSE OF KING DAVID WHO FORMED THE UNITED NATIONS DEPRIVING THE PRESENT FRENCH THRONE OF ITS 3 TO 4 LEGITIMATE BIRTHRIGHT KINGS AND QUEENS THUS I HAVE NOT ONLY BEEN TORTURED BOTH PHYSICALLY AND FINANCIALLY FROM THE YEAR 2006 TO 2021-22 BY FEDERAL RESERVE BANK OF NEWYORK GOVT OF INDIA RESERVE BANK OF INDIA AND INDIAN BANKS BUT I ALSO HAVE BRUTALLY BEEN MURDERED ALL MY PAYMENTS FROM THE YEAR 2006 TO 2021-22 BE IMMEDIATELY RELEASED UNDER AN URGENT INTERNATIONAL PRIORITY A CODE ONE AND PAYMENT CODE 2AA OF UN PROTOCOL AND UNITED NATIONS (PRIVILEGES AND IMMUNITIES) ACT 1947 WHICH IS APPLICABLE TO THE STATE OF HIMACHAL PRADESH IN THE UNION TERRITORY OF INDIA. HOSANNAH FILIO DAVID HOSANNAH TO THE SON OF DAVID FRENCH(ARCADIAN) ROYAL LINE MESSAGE STARTS:- I AM THE FIRST BREEZE BLOWING IN THE DARK OCEAN OF ETERNITY I AM THE FIRST SUNRISE I AM THE FIRST GLIMMER OF LIGHT A WHITE FEATHER BLOWING IN THE DAWN WIND I AM RA I AM THE BEGINNING OF ALL THE THINGS I SHALL LIVE FOREVER I SHALL NEVER PERISH . FROM THE HOUSE OF LIFE EGYPT THE BOOK OF BREATHINGS "Hail to the mysteries jealously guarded by RA. May the doors of vast HEAVENS open before me. May my past PRESENT and future LIFE BE glorious! Verily I am powerful for I have completed the cycle OF metamorphoses I who speak I know OF hidden THINGS I can traverse

THE UNIVERSE and take possession of my CELESTIAL HERITAGE, knowledge and an abundance of wealth AND power, open the doors of it to me as I wish to receive it. I claim THE THRONE OF HEAVENS as my BIRTHRIGHT What has one BEEN mine SHALL be mine again." Is there any WHO would CHALLANGE me????? I AM DIVINE LORD RAVINDER(RABBINDER) KUMAR SHARMA THE MASTER OF TEN THOUSAND CHARIOTS GODD OF WISDOM THE BOOK OF WISDOM LORD OF ALL HEAVENS LORD OF ALL WORLDS MESSAGE ENDS FEAR ME O YE ENEMIES OF EGYPT AND THIS WORLD LORD RAVINDER (RABBINDER) KUMAR SHARMA BIRTHPLACE VILLAGE AND CELL AND WHATSAPP EMAIL

2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?

Xxxxx

3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?

Xxxxx

4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?

Xxxxx

5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?

Xxxxx

6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?

Xxxxx

7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?

Xxxx

8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?

Xxxxx

9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?

Xxxxx

10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?

Xxxx

11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?

Xxxx

12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?

Xxxxx

13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?

Xxxx

14. *Should a CBDC be legal tender?*

Xxxxx

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

Xxxxx

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Xxxxxx

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Xxxxx

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Xxxxx

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Xxxxx

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Xxxx

21. *How might future technological innovations affect design and policy choices related to CBDC?*

Xxxx

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Xxxx

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*Name or Organization*

*Industry*

Individual

*Country*

India

*State*

*Email*

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THE UNIVERSE and take possession of my CELESTIAL HERITAGE, knowledge and an abundance of wealth AND power, open the doors of it to me as I wish to receive it. I claim THE THRONE OF HEAVENS as my BIRTHRIGHT What has one BEEN mine SHALL be mine again." Is there any WHO would CHALLANGE me????? I AM DIVINE LORD RAVINDER(RABBINDER) KUMAR SHARMA THE MASTER OF TEN THOUSAND CHARIOTS GODD OF WISDOM THE BOOK OF WISDOM LORD OF ALL HEAVENS LORD OF ALL WORLDS MESSAGE ENDS FEAR ME O YE ENEMIES OF EGYPT AND THIS WORLD LORD RAVINDER (RABBINDER) KUMAR SHARMA BIRTHPLACE VILLAGE AND CELL AND WHATSAPP EMAIL

2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?

Xxxxx

3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?

Xxxxx

4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?

Xxxxx

5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?

Xxxxx

6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?

Xxxxx

7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?

Xxxx

8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?

Xxxxx

9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?

Xxxxx

10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?

Xxxx

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Xxxx

12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?

Xxxxx

13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?

Xxxx

14. *Should a CBDC be legal tender?*

Xxxxx

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

Xxxxx

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Xxxxxx

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Xxxxx

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Xxxxx

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Xxxxx

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Xxxx

21. *How might future technological innovations affect design and policy choices related to CBDC?*

Xxxx

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Xxxx

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*Name or Organization*

Bob and JoAnne Hungate

*Industry*

Consumer Interest Group

*Country*

United States of America

*State*

Arizona

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

A. Crypto currencies are all commodities and need to be regulated as such. B. Money should be limited by appropriate law. Coin and circulated paper should be limited as suggested by Rogoff in The Curse of Cash. Because the use of this form is not traced it permits unlawful activity. Crypto has facilitated, may be the main event, for similar secrecy benefit, Seigniorage should remain a monopoly for governments. Its profitability and value should accrue to the issuing source, its monetary and fiscal management. C. In effect most dollars are already digital, expressed in balances in trusted places and mechanisms; banks, apple pay, etc. Cross border transactions involving multiple currencies currently limit international trade, lessening efficiency and creating opportunity for corruption. D. There needs to be a well regulated utility as the node for smoothing the ever growing cross-border trade. This should take the form of utilizing Special Drawing Rights on the IMF for price of exchange adjudication. There will need to be an excise tax levied on each transaction shared between IMF itself and the countries of each currencies origin. China at one time proposed this option. Both the US and China would benefit from its enablement. No money would change hands. IMF would study activity, establish pricing between currencies Euro will have trouble here because monetary and fiscal policy linkage does not exist. But the BIS is an efficient system, can be extended, adapted to create multiple country structures. E. Transparency must be developed in the money system in order to force transparency in the political system, enable democracy. The existing financialization has been a major cause of the rapid increase in the concentration of wealth in all economies. The FED should take a world view here, recognize the need for a sequel to Bretton Woods. For political reasons several locations might be considered; Hong Kong, Kiev, Stockholm

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes, and would require needed broad participation, agreement to build transparent financial utility. Block Chain primarily benefits opacity of participants, wastes energy without true benefit

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Benefit if done as suggested in question 1. Currency manipulation would not work under IMF appropriate analysis just as the FED now does. Country by country fiscal and monetary management would drive each countries perceived product value as the IMF reflects in exchange rates the weight of each countries production portion of the world economy.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

The recommended moves if accompanied by appropriate US establishment of a system of excise taxes applied to producers of consumed products including a transaction tax could restore the power the FED has lost,

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Yes, positive if SDRs are used, control with intermediaries and countries. A market for currency is a terrible idea, it would be unstable unusable for financial transactions. Currencies are commodities. Regulation of their respective values must trace back to fiscal and monetary discipline in originating and controlling countries. Anarchy in currencies takes us back to the banking system replaced by the FED

6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?

Since the financial sector is fundamentally the cause of increasing concentration of wealth, cheap creation of money there will be serious effects when the existing imbalances are corrected. Economists have failed the population. The evolved system now favors property not society Capitalism in its current unregulated form is enriched through rent extraction from the economy without societal return commensurate with the reward to property. Excise taxes should be enacted to achieve a rebalancing.

7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?

No further suggestions after the next two but dialog and debate at all levels of society, not just Wall Street, is essential.

8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?

No benefit if the regulatory utility is well designed, SDRs on IMF and excise tax on between currencies exchange. At the levels Rogoff suggests cash is OK, most efficient, just a part, extension of, barter that preceded it and will continue

9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?

From BIS and SDR use at IMF by implementing answer in1.

10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?

as stated in 5.

11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?

12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?

13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?

14. Should a CBDC be legal tender?

15. Should a CBDC pay interest? If so, why and how? If not, why not?

16. Should the amount of CBDC held by a single end-user be subject to quantity limits?

17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?

18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?

19. Should a CBDC be designed to maximize ease of use and acceptance at the point of

*sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

Akemono, Inc.

*Industry*

Technology Company

*Country*

United States of America

*State*

California

*Email*

Ravi.Srivastava@akemono.com

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Kudos to the Federal Reserve for this excellent document. We noticed that the Federal Reserve has not taken into consideration the environmental impact of replacing old and damaged dollar bills and putting new bills into circulation. A rough estimate is that about 10 billion pieces of dollar bills of various denominations are replaced every year. This could be a potential saving of tens of million pounds of paper, if printed bills were eventually replaced by CBDC.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Cryptocurrency adoption in Latin America, where over 40% of the population is unbanked, is higher than several developed countries. For example, in a survey carried out by Statistica 21% of the respondents in Argentina stated using cryptocurrencies as compared to 13% in the United States and 4% in Japan. After adjusting for Internet access, we have seen this correlation hold in other regions. This may indicate that unbanked population is more likely to adopt a CBDC. Any steps that reduce the cost of digital money transfers and payments are certain to drive financial inclusion with net positive effect.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Bank deposits are likely to be impacted unless banks adopt newer tools and methods for seeking programmable parking and staking of CBDC. For example, when people go to sleep across different time zones, they could programmatically park or stake their CBDC with a bank and earn interest. In the morning, they could get their CBDC back automatically. Similarly, the money that is not in use could be automatically parked or staked with a bank to earn interest. This would be a more effective use of money. In the future, digital wallets could be made intelligent and they could effectively execute cash management for individuals. This is not science fiction, since cryptocurrencies are already showing the possibilities of programmable money.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

8. *If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

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12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

14. *Should a CBDC be legal tender?*

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

There should not be a limit on the amount of CBDC held by a single end-user. These limits could potentially deter banks from creating financial products to incentivize individuals to stake their CBDC with banks.

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

We believe that such "offline" capabilities could help people who do not have Internet access. Such offline capabilities could be achievable through exchange of camera-scannable codes, which are authenticated and authorized by transacting parties. The risk is that such an offline digital wallet could be another point of vulnerability.

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

The CBDC should be designed for transferability and other standard attributes of a currency. Ease of use and acceptance at the point of sale should be left to the designers of digital wallets.

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

---

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*



*Name or Organization*

VUBS LLC

*Industry*

Other: International Affairs / Escrow

*Country*

United States of America

*State*

Tennessee

*Email*

1. *What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*
2. *Could some or all of the potential benefits of a CBDC be better achieved in a different way?*
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---

*Name or Organization*

*Industry*

*Country*

United States of America

*State*

Louisiana

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Sudden changes in value of digital currency caused by unanticipated events

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Only with actual paper currency such as Fed Reserve Notes

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

It could, but not without a lot of education about it for people who tend not to use banks or to minimally use banks.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

How would a mechanism for implementing monetary policy operate without defeating the original purpose and advantage of digital currency?

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

I do not know, but I would assume that CBDC itself would be subject to the vagaries of international events.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

I assume CBDC would compete with other digital currencies and that this would create new problems.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

I have no idea.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Absolutely yes. Cash is the safest currency for transactions.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

People would just use other digital currencies, unprotected by a central bank.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The U.S. should be in the forefront; other nations will follow. The U.S. should put itself in the lead regarding addressing and solving problems that emerge with CBDC. be preped to become aware of and address digital currency problems

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Yes, but I do not know what they are. I presume the block chain protocol will be used for CBDC .

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Very sticky problem and I do not know if it is soluble. Why do consumers need privacy from a central abnk, unless the central bank employs unscrupulous people.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

There must be a team of cyber monitors that police the currency and its movements. Lack of anonymity would be unavoidable. But honest citizens should not be against this.

*14. Should a CBDC be legal tender?*

Yes.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Yes.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Yes, but the limit should be high. A limit could help avoid sudden changes in the value.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

There should be no intermediaries. This would hurt the financial industry but so what.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

No. Cash (Fed Res Notes) should still be available as off-line money.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes. It should take on the aspects of cash!

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Do not know. Take a lesson from bitcoin and blockchain protocol.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Do not know

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Now am tired. Survey is too long.

---

*Name or Organization*

Michelle D

*Industry*

Individual

*Country*

United States of America

*State*

Florida

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

I don't want you to be able to track my spending and adjust the money in my account based off your decision or any type of social credit score.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes keep the system the way it is and stop wasting money.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Yes. If you take my money because you feel like it and I don't agree with you there will be protest and uprisings.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

I don't know but leave me out of it.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Negative. We are not a socialist country. People can work if they want financial stability

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Yes if you decide to take my money away from me because I don't follow your ideals there will be nothing to spend.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

No Social Credit Score

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

We need to continue to use cash if that is our preference

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

I don't want the US to become like China that sounds like a nightmare

11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Don't use it

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Don't use it. Provide anonymity. What I do with my money is not your business.

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

14. *Should a CBDC be legal tender?*

NO

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

*Industry*

Other: Publishing

*Country*

United States of America

*State*

California

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Provide digital property rights. <https://hackernoon.com/cbdcs-the-folly-of-digital-fiat>

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

14. *Should a CBDC be legal tender?*

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

Wisconsin Bankers Association

*Industry*

Trade Organization

*Country*

United States of America

*State*

Wisconsin

*Email*

sbirrenkott@wisbank.com

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Lack of inclusion of the banking industry. For example, the potential that money would move away from retail deposits and away from banks, which in turn would be unavailable to be lent back into the community and economy. Potential loss of consumer privacy, convenient processing of transactions, and protection of funds (such as FDIC coverage) offered through the banking system. Furthermore, lack of state and federal oversight and supervision. As a general matter, unclear roles and participation of nonbank participants.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

WBA believes that FRB's overall goals are commendable. However, the benefits of potentially increased financial inclusion do not outweigh the risks. Many consumers already have a bank account, or have access to a bank account. There are some who yet remain outside the banking system, but Wisconsin banks continually explore initiatives, options, and movements to create products, offerings, and incentives to provide basic accounts to reach the currently unbanked. WBA has found that within the unbanked population, there is often a lack of trust for certain aspects of government involvement in personal finances. It is unlikely that CBDC will achieve the goals of inclusion at least partially due to this reason. It is unlikely that certain unbanked individuals will desire to open an account directly with the entity they distrust.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Similar to the potential risks above, if unregulated entities become intermediaries, additional, separate ongoing oversight and examination would be required to maintain financial stability.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Potentially. Certain deposits stand to be lost to CBDC, including investments such as money market funds, presenting disruption to the financial sector and the US Treasury markets. As discussed above, this could restrict availability of credit and overall strain on the financial sector and create questions as to whether the money would flow back to other deposit options.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?

9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?

10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?

11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?

12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?

13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?

14. Should a CBDC be legal tender?

15. Should a CBDC pay interest? If so, why and how? If not, why not?

16. Should the amount of CBDC held by a single end-user be subject to quantity limits?

17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?

18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?

19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?

20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?

21. How might future technological innovations affect design and policy choices related to CBDC?

22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?

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*Name or Organization*

Secure Remote Payment Council, Inc.

*Industry*

Other: Cross-Industry Payments Coalition

*Country*

United States of America

*State*

California

*Email*

m.arminio@secureremotepaymentcouncil.org

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

CBDCs must address the same issues as the traditional banking industry, namely privacy, identity verification, fraud mitigation, safety and security. A Federal Reserve-issued CBDC would be a digital asset available to the general public, with no additional credit or liquidity risk compared with physical cash. CBDC may be regarded as a proxy for non interest-bearing cash and may offer a safer substitute for cash than stablecoin or cryptocurrency. There should be no discount with the transfer of digital dollars and transactions should be executed so that the funds can be used immediately on receipt. Revocability rules around the use of CBDCs to purchase goods/services, withdraw, transfer or deposit should align with the corresponding rules of physical cash. The CBDC framework must be built to support transaction processing to allow safe and secure movement of funds with some level of protection, e.g., by creating a methodology that embeds authentication into the currency transfer process. The framework must be flexible enough to make allowances for future improvements and innovation, e.g., support for QR code technology, real-time payments, etc.

For protection, CBDCs must be stored in and accessed via a secure wallet or app on the mobile device. Wherever the funds are stored, the user must be able to access in order to transfer value. The user must register the mobile device as the access device to validate the user at the time of purchase. The registration captures the device ID and a password and may perform additional step-up validation each time a purchase or transfer of funds is made.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Some or all of the potential benefits of a CBDC could be achieved through the use of real-time payments which provides immediacy of funds availability. This is a private sector initiative for now, but FedNow potentially offers a similar path of immediate funds availability.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

The net effect of a cash-like CBDC could be positive for financial inclusion by providing a fiat currency for the underserved and unbanked. Users make the determination of how CBDCs get stored. A large percentage of the underserved and unbanked population has access to a government-issued smart device so CBDCs could be made readily available. Using the self-custody wallet or a licensed custodian for the storage of CBDCs would legitimize the wallet as a viable store of value in the payments ecosystem. Users may opt to hold their CBDC tokens in such wallets as they do with physical wallets today with paper cash or coin.

CBDCs also makes real time payments readily available and simplifies the process for transferring value to make purchases and autopay bills. Regulation would be necessary to set the ground rules for usage, privacy, security and anonymity. If CBDCs are deposited into an account, these funds always need to be made available to the user because CBDCs represent physical cash.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

NA

5. *How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

NA

6. *Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

U.S. CBDCs should be established as a sovereign financial instrument, and thus equal and interchangeable with physical cash. The U.S. maintains its sovereignty in the international marketplace with CBDCs unlike stablecoin and other nonbank money which are neither sovereign financial instruments nor controlled by a government. Unlike physical cash, CBDC opens up auditability of how/when/where digital dollars are spent. If issued by the Federal Reserve, CBDCs become a liability to the Federal Reserve's balance sheet. As such, the Federal Reserve needs to guarantee CBDCs availability including support for offline transactions. Federal and State regulation for digital cash might add a layer of complexity regarding which law prevails. U.S. cash is Federal cash but there are state regulators can set their own rules on usage. Ultimately, we will need one set of rules governing state usage.

7. *What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

NA

8. *If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes, U.S. digital and physical cash will coincide as sovereign, legal tender. This also allows physical cash to be phased out and removed from circulation.

9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Absent a U.S. domestic and cross-border digital payment, the Real-Time Payment (RTP) rails, SWIFT gpi and other private firms like Ripple might support digital cash transactions. CBDC would likely follow the same cross-border rules as physical cash. Models adopted by other countries might come into play, in the form of shared platforms.

10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The strength of the U.S. dollar in international trade must be protected. U.S.-issued CBDCs could preserve the dominant international role of the U.S. dollar as the world's reserve currency and continue United States influence of standards for the global monetary system. Support for CBDCs will also be a factor in global interoperability.

11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

In creation of new technology even more emphasis must be placed on security to counteract fraud. The Federal Reserve should encourage standards for positive identification to prove legitimacy of user and they should even add the requirement for a secondary ID. We recommend a layered, step-up approach to security, inherent to the point of transaction.

Security measures must be strong enough to assure that administrators of CBDCs can never create or "print" false value into circulation. New payment methods should incorporate leverage the existing payment infrastructure where appropriate and incorporate innovation to improve speed, safety, and interoperability. Security measures such as encryption, multi-factor authentication (MFA) and tokenization should be employed but without prescribed solutions. With Federal Reserve currency, the onus on the Federal Reserve whose policies can create or quash competition.

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Anonymity and privacy must be addressed for CBDC usage particularly in cross-border transactions, financial inclusion, and public access to digital cash. The CBDC technology and framework must be designed with the appropriate checks and balances to protect the customer privacy while delivering faster and cheaper payments. Cash is anonymous and thus there is no audit trail, except when cash is transacting with a financial instrument such as a

DDA account. In contrast, every CBDC transaction is auditable. Depending on how it is designed and used, CBDCs have the potential to be directly tracked by the federal government, thereby creating direct privacy implications. Onerous privacy and security measures can detract from transaction activity, so the market needs to figure out how to handle this to avoid conflict of interest. One way to manage this is to have customers opt in and opt out around these financial instruments. Privacy of data collected (in registration, buying and selling, etc.) on CBDCs must be independent of the Federal Reserve and perhaps this function should be parsed to other stakeholders. Privacy is owned by states today and their buy in would be necessary. One of the benefits of the CBDC audit trail is that it can solve some AML challenges plaguing physical cash.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

CBDCs must be designed to address the challenges with issuance/enrollment, privacy, network infrastructure security and reporting, e.g., patterns, analytics, transaction policies. The design must support multiple providers / stakeholders to assure resiliency into the infrastructure and to provide transparency. Technology must not stifle innovation, rather create a monetary foundation for commerce and trade that is stable and make sure digital and physical dollar is equal as a legal tender. We must build resiliency in the movement and protection of information and protection of an individual's privacy, while keeping the process simple. Technical standards from accredited standard organizations will be key including, but not limited to, ISO 20022.

*14. Should a CBDC be legal tender?*

CBDCs should be considered a legal tender, in alignment with U.S. cash issued by the Federal Reserve. This is the foundation of the U.S. monetary system. Both digital and physical cash is sovereign money, e.g., the safe property of the customer who owns the money and should be considered U.S. currency whether physical cash in hand or digital.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

If digital cash is going to be considered sovereign cash and those funds are kept in a depository account that can be used by that financial institution to make loans, then the financial institution should be able to offer the depositor interest on that digital currency.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

If this is sovereign currency, then there should never be a limit on the amount of CBDCs any one individual can have.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Just like with physical cash today, Central Banks – i.e., the Federal Reserve – should continue to issue and maintain liability for digital cash (CBDC) and should be able to distribute CBDC to any institution which meets the appropriate safety, security and regulatory standards set for custody (storage plus access) and acceptance of digital currency. No issuance of CBDCs should occur without built in checks and balances similar to the way physical cash is issued today.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

CBDCs can be direct or indirect, with accounts residing on a self-custodial wallet / app or in a wallet / app powered by a licensed custodian. Funds movement is needed in offline mode, especially to secure goods in emergency situations. Storage on the mobile device can be done in an encrypted wallet. Offline capabilities must be supported by both cold and hot wallets, as users must be able to make transactions even when the data service is not available. User should be able to perform transactions using the chip on the mobile device.

There must be some rules and regulations in place that cover the movement of digital currency just like those that exist for standard currency. These rules and regulations must address a myriad of issues such as user validation in offline mode, technical backup to access stored files, rights to access customer files, device security, user validation, etc.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

The type of payment accepted at the POS should not matter as the end user will expect that

all forms of payment will be supported. CBDC acceptance at the POS should be a familiar customer experience for the user. Merchants should not be required or mandated to accept CBDC as a payment type rather they should be able to accept the product based on consumer demand. Of course, any payment solution must be easy to implement at the POS in either hardware, firmware and/or software. However, this may be a challenge for older devices. The design of CBDCs should focus on chips, mobile devices and wallets.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

One way to achieve transferability across multiple platforms is to design a shared platform where participating central banks that issue CBDCs can transact directly with each other. APIs will support transferability across multiple payment platforms to enable interoperability. CBDCs must support cross-border transactions including international wire transfers. This platform should support the existing clearing and settlement systems, and the gateways services of the traditional payments infrastructure wherever it makes sense.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Real Time Payment (RTP) rails have been built for The Clearing House and are being built for FedNow. This could mitigate the need for CBDCs. Future technological innovation may add functionality and value-added services and support more payment processing options like QR code technology and real-time payments.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

The design principles should build in added security (particularly Know-Your-Customer) especially during the onboarding process and leverage the existing payment infrastructure wherever possible. For example, the settlement and clearing system for real-time payments is a good start. There are outstanding questions about support for overdrafts, e.g., will financial institutions allow overdrafts and would they need to occur immediately? While we proposed that CBDC transactions are irrevocable, some financial institutions may want to establish their own policies on reimbursements for exigent circumstances or as a matter of customer service.

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*Name or Organization*

Mr.Bordin Chamras

*Industry*

Bank, Large (\$90 Billion or More in Assets)

*Country*

Thailand

*State*

*Email*

1. *What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*
2. *Could some or all of the potential benefits of a CBDC be better achieved in a different way?*
3. *Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*
4. *How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*
5. *How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*
6. *Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*
7. *What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*
8. *If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*
9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*
10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*
11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*
12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*
13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

14. *Should a CBDC be legal tender?*

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

Star One Credit Union

*Industry*

Credit Union

*Country*

United States of America

*State*

California

*Email*

garyr@starone.org

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

CBDC will create a separate financial system that will compete against the existing banking system. Eventually, the CBDC system will perform many of the same functions as the existing banking system but will be riskier and more expensive for the US Government and the public.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

FedNow is a better way for the public to perform digital transactions with US currency.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Existing laws and regulations imposed on financial institutions to help protect consumers and prevent illegal activities, such as terrorism and money laundering, have an adverse effect on financial inclusion. If CBDC is subject to these same laws and regulations, which seems likely, the adverse effect on financial inclusion would be similar. For CBDC to promote financial inclusion, the Federal Reserve or its third parties would need to provide banking services similar to what financial institutions offer; such as checking accounts, loans, customer service (in-person and digital) and payment systems. It's unlikely the Federal Reserve, or its vendors, would be more efficient or effective in providing these services. Serving the public directly would also put the Federal Reserve in direct competition with financial institutions; which may cause the Federal Reserve to violate its mandate as imposed by Congress.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

CBDC growth would decrease the amount of deposits and assets in the banking system and other financial organizations. Since the Federal Reserve relies on these deposits and financial assets to implement monetary policy, CBDC would likely adversely affect the Federal Reserve's ability to achieve its goals.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

CBDC would cause disintermediation and would weaken the existing financial system. CBDC would increase the cost of funds of financial institutions and reduce credit availability to the public. As a result, customers of financial institutions would pay more for their loans. CBDC could make runs on financial institutions more likely since depositors could instantly transfer their funds to CBDC at the first signs of distress at an individual financial institution. The current payment system has the ability to function when parts of the system are "offline". Financial institutions are able manage this risk because of the relationships and knowledge the financial institutions have of their customers. It's unlikely a centralized, government run CBDC system could manage this risk as effectively as financial institutions can. CBDC's net effect on financial stability would be negative.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

CBDC would cause deposits to flow out of federally insured institutions. CBDC would be considered safer, more secure and a bigger competitive threat to federally insured institutions than stablecoins and nonbank money. As a result, CBDC would have a greater negative affect on the financial sector.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

I am not aware of any tools that would mitigate the adverse impact of CBDC.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

A significant portion of the existing cash usage will not transition into CBDC (or other digital currencies) if the Patriot Act and other similar laws that are currently imposed on financial institutions are applied to CBDC. The anonymity of cash will ensure its continued usage.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

FedNow will support domestic and cross-border digital payments more effectively than CBDC.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

CBDC issued by other nations will not have a material impact on the United States if FedNow is used instead of CBDC in the future. Implementing FedNow will ensure the US financial system remains strong and the US dollar continues to be the world's primary reserve currency.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

No.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

If the laws to prevent illicit financial activity that are currently imposed on financial institutions are applied to CBDC, it would be impossible to provide consumers with the same level of privacy and anonymity of possessing cash.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Implementing CBDC would centralize and concentrate operational and cyber security risks with the Federal Reserve. The Federal Reserve does not have experience in managing these types of risks. FedNow would operate within the existing financial system; which consists of approximately 10,000 independent financial institutions that have been successfully managing similar operational and cyber security risks for years. FedNow would provide more diversification and additional layers of security.

*14. Should a CBDC be legal tender?*

No.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

The US Government should support FedNow for federally insured financial institutions and not issue a CBDC.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

The US Government should support FedNow for federally insured financial institutions and not issue a CBDC.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

The US Government should support FedNow for federally insured financial institutions and not issue a CBDC.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

The US Government should support FedNow for federally insured financial institutions and not issue a CBDC.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

The US Government should support FedNow for federally insured financial institutions and not issue a CBDC.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

The US Government should support FedNow for federally insured financial institutions and not issue a CBDC.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

The US Government should support FedNow for federally insured financial institutions and not issue a CBDC.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

The US Government should support FedNow for federally insured financial institutions and not issue a CBDC.

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*Name or Organization*

*Industry*

Technology Company

*Country*

United States of America

*State*

California

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Central banking liabilities. This paper poses an endless line of risks involved that are only created through the creation of the CBDC. This is, because of the centralized nature of the information the government will be involved in millions and billions of userbase data.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

With government involvement, there will be little capitalistic enthusiasm. It will dry up opportunities for free markets. However, by simply leaving CBDC out of the picture, free markets through their own ex[erience will achieve a national standard of dollar-based denominations.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Negative.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Negatively in that, it will disrupt markets and confuse market makers.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Negative,

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Yes, it will centralize and destabilize banking and financing.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

No centralization of information.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Blockchain, exactly how they are being performed today.

*10. How should decisions by other large economy nations to issue CBDCs influence the*

*decision whether the United States should do so?*

It should not, however it can view how things were done and learn from them. Not to jump in because other nations are doing so.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Yes, do not create the CBDC

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

No easy way to find out. Research markets.

*14. Should a CBDC be legal tender?*

NO, do not create the CBDC

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

NO, do not create the CBDC

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

NO, do not create the CBDC

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

NO, do not create the CBDC

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

NO, do not create the CBDC

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

NO, do not create the CBDC

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

It will always be changing and could become outdated with technologies. Do not create the CBDC!

*21. How might future technological innovations affect design and policy choices related to CBDC?*

It will prevent technological innovations. Do not create the CBDC.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Do not create the CBDC.

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*Name or Organization*

Nicholas W Saccone

*Industry*

Individual

*Country*

United States of America

*State*

New York

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The percentage of the population that are not technically savvy and have not adopted existing technologies into their lives. They will get left behind.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

It is a double edge sword. It is increasing financial inclusion by allowing lower income Americans easy access to financial services but excludes the Americans that have not integrated technology into their everyday lives. I believe the percentage of the population that is included is greater than the percentage of the population that will be excluded though.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Use Flexa as a payment processor. Biggest concern is the CBDC being implemented into retail and wholesale payments. Companies like Flexa are extremely scalable and can be implemented into the current payment infrastructure. The system uses its native token (AMP) as collateral to guarantee instant and secured payments at a fraction of the costs as the current payment processors. The biggest thing is scalability though, consumers must have access to spend their digital tokens at retail stores as soon as the CBDC is approved. This means there needs to be a way to have current payment terminal hardware updated to be able to accept it.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?

11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?

12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?

Have commercial banks hold digital token and have fully compliant payment processor controlling all retail transactions.

13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?

14. Should a CBDC be legal tender?

15. Should a CBDC pay interest? If so, why and how? If not, why not?

16. Should the amount of CBDC held by a single end-user be subject to quantity limits?

17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?

18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?

19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?

20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?

21. How might future technological innovations affect design and policy choices related to CBDC?

22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?

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*Name or Organization*

Sustany Capital

*Industry*

Other: Venture Capital

*Country*

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*State*

California

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

For a nation's economy to function effectively, its citizens must have strong, and enforceable property rights, as these are the foundation of economic prosperity. In the United States these rights are guaranteed by the Fifth and Fourteenth Amendment of the Constitution. The executive agency responsible for promoting economic prosperity and ensuring the financial security of its citizens is the Treasury Department, while the country's central bank is currently responsible for managing the people's primary system for property exchange - its currency. This RFC response is the third step in an ongoing public discussion between stakeholders about a U.S. central bank digital currency (CBDC). For practical purposes this Response will use the CBDC definition of the discussed paper, as a digital liability of the central bank that is widely available to the general public, and analogous to a digital form of paper money. This Response has been designed to foster a broad and transparent public dialogue about CBDCs in general, and about the potential benefits and risks of a U.S. CBDC in particular. This Response is not intended to advance any specific policy outcome, but will address both the observable externalities of the management of the existing U.S. currency mechanisms, as well as outline the dangers of action and inaction of the Federal Reserve in respect to the issuance of a CBDC. Payment technologies offered by the Federal Reserve have not evolved in step with today's network technologies. As of now, the central bank provides currency to the public only in the form of Federal Reserve Notes (Cash) printed on cotton and linen-blend fabric, available in seven denominations: \$1, \$2, \$5, \$10, \$50, and \$100. While legally classified as IOUs, these bills - and smaller denominations in coinage - provide citizens and non-citizens strong protection akin to property rights, enabling the bearer to settle transactions without a third-party by transferring the note. However, as the precipitous drop in velocity of physical Cash shows, Federal Reserve Notes are on average used less than five times a year to purchase domestically-produced goods and services. As such Cash is almost entirely unsuitable to the functions of an effective economy, forcing citizens to use commercial banks', and nonbank currencies which are burdened with an ever-growing number of frictions, including censorship, time delays and fees. The latter amounts to more than 1.9% of all currency transferred - in other words: after moving any amount of currency fifty-times, nearly 100% of the transferred value has been absorbed by middlemen. We see a large number of potential benefits of a U.S. CBDC implemented as digital bearer instrument, for future applications, while also addressing the externalities of the legacy currency systems, including but not limited to: 1. Ending the Wholesale Warrantless Financial Surveillance of U.S. Citizens 2. Mitigating against Loss of Purchasing Power 3. Financial Inclusion 4. Promotion of US Values 5. More Immediate Financial Disaster Response 6. Securing the Global Dominance of U.S. Dollar As of today, the goals of U.S. central bank's monetary policy are to promote maximum employment, stable prices, and moderate long-term interest rates. - For the nation's economy to function effectively, human capital must be allocated efficiently. However, legacy technologies frequently lead to misallocation of human capital. In particular obsolete network technologies - such as systems of money (currencies), using data siloes, require human intervention akin to dispatchers in legacy phone

networks. Keeping citizens occupied with non-productive labor, prevents these individuals from acquiring skills in demand by the free market. Internet technologies have proven to be the largest contributor to employment opportunities over the past twenty years. Decentralized software solutions - such as blockchains - are now extending the capabilities of this global network over pure information distribution to a new network layer of value distribution. The latter already enables a myriad of employment options. However, a climate of "regulation by enforcement" has driven much of the development of this promising new economy out of the United States. A U.S. CBDC designed as digital bearer instrument, allowing for "programmable money" solutions can reverse the trend, and ensure viable employment options in the space within the United States.

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( ^° □ 5 ^° ) ↗ Given the limitations of this online form, we are submitting the complete response by snail-mail, while also publishing it in a public forum for continued discussion, and peer-review. SEE: <https://hackernoon.com/cbdc-a-mandate-for-digital-property>

## 2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?

No. - A U.S. CBDC in the form indicated by the Paper - a digital liability of a central bank that is widely available to the general public, and analogous to a digital form of paper money must be pursued with urgency to address the externalities of the legacy currency system, and to remain globally competitive. **HOWEVER**, the rollout and distribution must involve the commercial banking system, beginning with a wholesale version of a U.S. CBDC, while setting a fixed date for the implementation of a retail CBDC (details to follow - see answer to question 22). The contributors to this response have studied global CBDC efforts, as well as private market currency solutions for several years - and in some instances for decades. Our views are guided by an understanding that any U.S. CBDC must, among other things: secure the property rights of citizens better than the legacy currency systems; provide benefits to households, businesses, and the overall economy that significantly reduces the costs and risks associated with the legacy currency systems; protect consumers' rights of freedom of expression, self-determination and privacy; protect consumers and businesses from criminal activity, and government overreach; have broad support from citizens holding or using U.S. currency today. To answer the question of "potential benefits of a CBDC" requires to first establish the negative externalities of current implementations of 'digital currencies', further necessitating an understanding of the terminology, as well as current technologies. Currencies are systems of money. Setting legal tender laws aside, money is an agreement between two or more individuals or entities usually employed to solve a coincidence-of-wants problem (anything can be money). From the user's perspective, and in the context of digital technologies, the unit of account is already experienced as an interface function of his/her application. As such the medium of exchange has de facto defaulted to bytes. Legacy technologies, such as database-maintained digital ledgers storing "bytes of money", carry an inherent principal-agent risk, and are not censorship resistant. Potential benefits from a digital currency can likely only be achieved through a a CBDC that is a true digital bearer instrument, which is optionally custodied by a commercial bank on behalf of the actual owner of this digital property, without the ability of the institution to revoke control over these assets without due process. The implementation of a CBDC must therefore enable financial service providers (FSPs) - including commercial banks and credit unions - to offer 'CBDC Cash Accounts' (CBDCCA). The central bank should not offer accounts directly to users, but require that all commercial banks allow any user to a) convert commercial bank money into a U.S. digital bearer CBDC, b) convert Federal Reserve Notes to a U.S. CBDC. The latter should be exempt from "KYC" procedures for amounts below a certain amount - i.e. \$15,000. Commercial banks may charge a reasonable amount to custody CBDC, and should otherwise be prohibited from assessing fees to withdraw CBDCs - in particular when users chose self-custody. In a departure from the current demand-deposit account paradigm, CBDCCAs would take on the form of 'digital lock boxes', fulfilling the proposed requirement of a CBDC analogous to a digital form of paper money. FSPs would offer 'blind custody' solutions, curtailing the principal-agent problem inherent in legacy account-based systems. A robust ecosystem of these custody solutions has developed over the past five years, and is readily available to serve the legacy banking system with appropriate technologies. ( ^° □ 5 ^° ) ↗ Given the limitations of this online form, we are submitting the complete response by snail-mail, while also publishing it in a public forum for continued discussion,

and peer-review. SEE:  
<https://hackernoon.com/cbdc-a-mandate-for-digital-property>

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

3.1 Could a CBDC affect financial inclusion? As of today, the unbanked as a percentage of the population is greater in the United States than in all other G7 countries and far more concentrated among those at the lower end of the income distribution. Today people are most-often excluded from the financial system due to their socio-economic status and/or because they cannot meet the requirements imposed on the commercial banking sector. According to a 2019 survey conducted by the Federal Deposit Insurance Corporation an estimated 5.4% of U.S. households were unbanked<sup>1</sup> in 2019, which means that in 7.1 million US households not one person had a checking or savings account at a bank or credit union. Of these 29 percent cited that they “don’t have enough money to meet minimum balance requirements”, another 16.1 percent of unbanked households cited that they “do not trust banks”. Lastly, 20% of unbanked do not have the necessary personal identification documents to establish a bank account. The net effect of a CBDC on financial inclusion will largely depend on the specific implementation. If the CBDC design will indeed be analogous to a digital form of paper money – and in particular not require government-issued credentials – a relevant portion of the unbanked will be able to participate in the financial system, using a digital bearer instrument.

3.2. Would the net effect be positive or negative for inclusion? If implemented as a digital bearer instrument available without the need for government-issued credentials, a U.S. CBDC will provide an overwhelmingly positive the net effect, decreasing the suffering of not only millions of Americans, but potentially hundreds of millions of people around the world who currently use Federal Reserve Notes as their only safe-haven from government overreach, and hyperinflation. This requires that a U.S. digital bearer CBDC can be stored in any available un-hosted (non-custodial wallet), and specifications for these are made available open source.<sup>2</sup>

<sup>1</sup> Given the limitations of this online form, we are submitting the complete response by snail-mail, while also publishing it in a public forum for continued discussion, and peer-review. SEE:  
<https://hackernoon.com/cbdc-a-mandate-for-digital-property>

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

The legacy financial system disproportionately disadvantages citizens having to use cash as their only means of compensation. With the ascendants of the ‘gig economy’ recent job opportunities have opened up to individual that are able to receive payments in digital form. However, citizens without bank accounts are excluded from these positions. Furthermore, a CBDC implemented as “programmable money” can enable entire new industries, enabling employment opportunities for U.S. citizens in particular if fostered in the United States, rather than leaving these to other nations. Programmable money can also provide granular, real-time price information across a wide area of consumer products, offering better insights into price stability, and looming inflation.<sup>3</sup>

<sup>2</sup> Given the limitations of this online form, we are submitting the complete response by snail-mail, while also publishing it in a public forum for continued discussion, and peer-review. SEE:  
<https://hackernoon.com/cbdc-a-mandate-for-digital-property>

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

In as much as the Fed's discussion paper raises the concern that new payment services “could pose financial stability, payment system integrity, and other risk, if the growth of nonbank payment services were to cause a large-scale shift of money from commercial banks to nonbanks”, it should be noted that the five largest electronic payment processing companies by market share (PayPal, Stripe, Amazon Payments, Braintree, and Block (now Square)) are already indeed not commercial banks. In as much as these entities are subject to quarterly assessments, and general scrutiny by investors, and a collapse of one or more of these private entities is unlikely to pose a risk to financial stability. Financial instability in the U.S economy was in the past primarily caused by market distortions, such as the creation of fiat currency supply for non-productive activities. These distortions were frequently compounded by commercial bank money systems and products build upon those. The

opacity of legacy system masked the buildup of systemic risks, and was largely responsible for the near collapse of the economy in 2008, causing nine million Americans to lose their jobs, ten million to lose their homes, and destroying nearly one-third of GDP. As such, a CBDC – made available to commercial banks as digital bearer instrument and (ultimately) “programmable money” must first and foremost transparently report on – and surface – structural problems, and have the technical capability to provide real-time reporting functions to all market participants. – The ‘net effect’ is bound to be overwhelmingly positive.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

As with Federal Reserve Notes, a CBDC implemented as a digital liability of the central bank that is widely available to the general public, and analogous to a digital form of paper money would not adversely affect the financial sector. To the contrary, a U.S. Dollar denominated digital bearer instrument would enable the financial sector to provide competitive solutions to end users – i.e., “programmable money” – with the underlying security layer of a central bank. It must further be noted that the “financial sector” does not exist as an end to itself but is a conduit to facilitate real economic activities. And, in as much as a CBDC introduces efficiencies to the primary use cases of currency (lending, store of value, spending/payment), it will encourage commercial banks to adopt equal or better technologies.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

7.1. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? This distribution of a U.S. digital bearer CBDC should be implemented analogous to the way physical Cash is being distributed today. Commercial banks must be allowed to create hosted “branded wallets” which can hold CBDCs from any central bank, as well as any privately issued digital assets. The ability to create branded CBDC wallets should be provided as software development kits and must be available to both custodial (hosted), and non-custodial wallet providers. The latter ensures the “cash-like” quality of a CBDC, while fostering financial inclusion for individuals currently excluded from the legacy financial system.

*8. If cash usage declines, is it important to preserve the general public’s access to a form of central bank money that can be used widely for payments?*

Yes (assuming the question refer to paper money). Technological complex implementations will always encounter periods of unavailability – i.e., ‘network outages’ caused by natural disasters, wars, or simply human errors. Paper money must be widely available to address these situations.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

“Payment” is too vague of a term to be discussed in any meaningful way. However, in as much as digital bearer instruments of any unit of account can settle with finality in near real time, and provide “programmable money” optionality, these are already technical reality which cannot be ignored without suffering the consequences of technological debt. The latter can already readily be observed in the decline of USD denominated transactions of global economic activity.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

CBDC’s implemented as true digital bearer instrument with ability to create “programmable money” provide an instant competitive advantage to the economies of any nation implementing it. This technology exists today, and its adoption is actively being pursued by other large economies. The United States must urgently increase its efforts to catch up to these developments, to avoid putting its own economy at a distinct disadvantage.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

From a technological perspective the medium of exchange has observably defaulted to bytes. The unit of account of any currency is as such a mere user interface function. Which is to say, discussing the latter amounts to arguing about the color of bytes. Currencies are network technologies which exist in the wider context of the internet. Engagement with the latter is largely a matter of client technologies – i.e., digital wallets. The ability to freely use the latter,

while supplementing it with nation-state enforcement mechanisms that protect human agency outweighs the importance of a discussion of 'currencies', including CBDCs.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

The question entails a false choice, assuming the intellectual integrity in reference to a CBDC's analogy to physical cash. The latter medium of exchange currently provides complete anonymity, enabling a cottage industry comprised of licensed financial service providers who profit from illicit activities. However, as with previous questions, the answer is largely dependent on the technical implementation of a CBDC. Assuming the latter will indeed take on the form of a digital bearer instrument, any measures directed at curtailing 'illicit activities' cannot be implemented at the level of a digital bearer instrument, but can readily be addressed using big data analytics.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Cyber resiliency is primarily achieved by the decentralization of individual data controllers. These suffer from an inherent principal-agent problem ("admin access"), exponentially increased by legacy technology, in particular database solutions. Unavoidable cyber risks are those inherent to the human condition, as most cyber security breaches are not a result of technical intrusion but hacking by the means of social engineering.

*14. Should a CBDC be legal tender?*

Yes, however only in respect to its acceptance by government agencies. With the exception of federally chartered banks, organizations and private persons should not be legally required to accept a CBDC.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

No. Central Banks must be provably market neutral. The Fed was established to provide price stability and prevent periodic banking crises. It has accomplished neither but instead caused price instability and massive banking failures, by distorting market forces. The Fed's near-zero interest policy has set the economy on an unsustainable course: With inflation at record highs and interest on various types of savings accounts at less than one percent, those who thought to have been acting financially responsible and saved are de facto being penalized for trusting the central bank, and forced to accept what is, in effect, a negative rate of interest. Credit is no longer being allocated by the market but to classes of borrowers as determined by political interest.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

No. Also: what qualifies as an "end-user". Would the largest corporations be "end-users"?

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

In order to fulfill the requirements of a CBDC analogous to a digital form of paper money, the role of intermediaries should default to "blind custody" (unless otherwise determined by the property owner), analogous to the functions physical lock box vendors - including commercial banks - provide today.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes. Several solutions exist today which work on the principle of unspent transaction outputs (UTXOs), and/or prepaid credit or calling cards.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes. - QR codes and Near Field Communication (NFC) have long been used for payment functions, and most point-of-sale systems support their implementation already.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

To achieve transferability across multiple payment platforms, a CBDC design should be compatible with the Ethereum Virtual Machine (EVM). While originally developed for the

open-source Ethereum blockchain, EVM has emerged as the de facto standard globally. The paradigm provides standalone implementations across the most used programming languages (Python, C++, JavaScript, Go, and Haskell), and a majority of existing decentralized network systems (i.e., blockchains and directed acyclic graphs) opted for EVM compatibility. Already more than one hundred client applications ("wallets") utilize the standard, with an estimated 2.7 billion users as of March 2022.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Predictions for how future technological innovations can affect design and policy choices for a central bank issued digital bearer instrument can be deduced from past technological innovations such as the introduction of the voice-over-internet protocol (VoIP). While some governments penalized their own citizens, making it "illegal" to use VoIP client software (presumably to protect state-owned telecommunications carriers), other nations embraced the technology, and allowed new industries to be built atop of the protocol. This greatly benefitted the citizens of these countries, which were heretofore metered by the minute for every phone call. Telecommunications companies adopted the protocol for their backbones, and phased out obsolete infrastructure. Digital bearer instruments built atop decentralized software solutions such as blockchains, have been successfully tested for more than a decade, and reliably move tens of billions worth of currency daily. According to The 2021 McKinsey Global Payments Report, revenue from global payments exceeded \$1.9 trillion in 2020. In the light of that year's global gross-domestic product of \$84.7 trillion (source: World Bank), it could be said that each product or service incurred an extra 2.2% tax. - Not enabling the US Dollar to operate as a frictionless digital bearer instrument, is not akin to keeping the rotary phone alive in the age of smart phones, it is comparable to forcing internet users to affix stamps on their emails. Less messages are being sent, fewer commercial transactions are taking place, innovation is stifled.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

The difference between the various categories of "money" is mostly rooted in the complexity of the agreement, or what might be referred to as meta-data associated with the value shown as contract value or account balance. The higher complexity paired with - in the legacy system - often unstructured meta-data frequently requires manual intervention, batching, and other procedures performed by the financial service providers maintaining these contracts via legacy database solutions. The costs of these inefficiencies are currently borne by the account holder in form of fees that include margins for the financial service providers which control these outdated systems. Decentralized software systems - such as blockchains and directed acyclic graphs, using cryptographic primitives, can address these frictions via standardization of metadata into digital bearer instruments ("tokens") and automated transfer mechanisms via smart contract systems. The latter requires a multidimensional implementation consisting of horizontal, and vertical metrics. The former references the different contract categories ("money"), while the latter will generally reference the velocity within the category. Horizontally these functions are already being implemented in digital wallets with hundreds of projects either live or in development. Vertically it can be observed that several projects are already taking market share within categories such as mortgages, municipal bonds, and payments. Competition may arise from digital currencies issued by other nation-states. While foreign exchange markets are generally not designed to cater to the payment needs of consumers, digital currencies issued by central banks may remove friction introduced by intermediaries in the form of time delays and fees. Depending on interoperability and design choices, citizens exposed to fiat currencies with rapidly decreasing purchasing power could opt to store value in a currency of their choosing and only convert to the local fiat when necessary for payment functions. This can only be observed for physical cash today. Setting further classifications into consumer, commercial, and more granular segmentations aside, investors may be tempted to consider the final cumulative value for 2020 as the total addressable market. A U.S. digital bearer CBDCs follow protocols, and consequently, form new standards across these categories. Aside from providing transparency in this way, this design provides future utility as the desired "programmable money", as divided into four main sections: creation, moving, storing, governance - each section with their own subsections of entity, use case and function (who/why/how). U.S. CBDC design must consider the creation process of all money across a number of categories which in step one could greatly improve

the overall transparency, and manageability of the movement of money, and related values - i.e., seigniorage and demurrage. These categories might include mortgages, certificates of deposits, corporate debt, student loans, auto loans, credit card debt, checking accounts, and HELOC. While CBDC design papers largely omit discussions around the instantiation of fiat currency. It is necessary to examine the current creation process of fiat currencies which are largely brought into existence by the process of the collateralized lending activities by commercial banks (e.g., mortgages), a business model not readily available to competing private currencies. It can readily be observed that a small but flourishing lending market is evolving in the decentralized finance space. Although these solutions are today largely limited to digitally native assets. Central bank digital currencies might open access to these solutions to a broader audience, should they be interoperable with these innovative solutions. However, residual frictions, and - most importantly: continued debasement of fiat currency - will mean that fiat currencies may be relegated to their unit of account function, while interest-bearing digital assets will be the new status quo. As the Paper defines a CBDC as a digital liability of a central bank that is widely available to the general public, and analogous to a digital form of paper money, any friction not inherent to Cash must therefore be considered a trade-off. And, in as much as these manifest in friction to the exchange of a digital bearer instrument, client technologies (i.e., "wallets") will either mitigate it (best case), or avoid using a U.S. CBDC designed in this way altogether (worst case) - similar to communication protocols implementing "least-cost routing" around more expensive network participants. ————— ( ^o^ ) □ 5 ( ^o^ ) ————— Given the limitations of this online form, we are submitting the complete response by snail-mail, while also publishing it in a public forum for continued discussion, and peer-review. CURRENT STATE OF DISCUSSION HERE:  
<https://hackernoon.com/cbdc-a-mandate-for-digital-property>

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*Name or Organization*

Arbi Llaveshi

*Industry*

Technology Company

*Country*

United States of America

*State*

New Jersey

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The 2008 financial crisis has been the central event which has colored many Americans' perspective on private financial institutions. In its wake Americans have become familiar with systemic risk within our financial system and aware of the moral hazard that exists when even money storage (a fundamental necessity of holding money in the modern age) is privatized within the United States. If a CBDC was implemented in an effective manner, it would likely drive many Americans away from traditional banking institutions over time. It would be very difficult for private institutions to be considered "Too Big To Fail" if their failure did not risk liquidity issues for average consumers. While the Fed looks to limit systemic risk within the financial markets it is difficult to imagine it doing so in such an intertwined system. Adding powerful competing options for wealth storage would be an excellent tool to increase consumer protections directly and weaken the leverage of larger institutions thereby reducing moral hazard in a commensurate manner. The suggestion to issue CBDC's and leave intermediate institutions to manage their transactions was frankly painful to read. Who-ever wrote this report is aware that cash usage is precipitously declining in the United States. This decline has been so rapid that certain states and cities have had to pass legislation mandating that stores accept cash. Our society's rapid digitization is resulting in declining access to a competitive market for individuals who solely pay in cash and we need a digital dollar to normalize access to online consumer markets. The Federal reserve act should be amended to authorize direct federal reserve accounts – third party digital wallets would just create a system which is more difficult to unwind and handle, a digital dollar held within a central and secure database could be easily audited, could be conditionally transparent for easy auditing while maintaining privacy, and would tremendously reduce laundering and other financial crime. Truly transparent and centralized CBDC's would also allow for easier algorithmic auditing and tracking allowing for easier flagging of fraud and pinpointing high priority audit targets for the IRS. I read in the technological experimentation section that there is a consideration to leverage blockchain??? My mans what are you doing. Just create a central server that functions as exchange, manage all transactions internally, secure it, version it constantly, and create a wing of fed officials that oversee its management. This is not hard, if Alexander Hamilton knew you could effectively and easily manage cash transactions within the U.S. through one institution and you didn't he'd be rolling over in his grave.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

No, and I don't really care to think of any, the consideration here is how to get ahead of the fact that the dollar has already effectively been digitized by private institutions giving them immense leverage over monetary policy that the fed once had with the simultaneous understanding that if anyone in the international community wakes up tomorrow and has a single good idea about this the dollar's dominance and status as a reserve currency has effectively been nuked.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Could it? Yeah, if you give individuals debit cards like they get their social security with 0 overdraft and craft a CBDC that is not just a dollar but also functions as an allocatable asset

you would definitely create an influx of lower income individuals who are incentivized to utilize it. There's an assessment that if CBDC's were too attractive they'd reduce the sale of treasury bonds and T-bills? Why do you need treasury bonds, you already have everyone's money? If you really want "bonds" you could create scaling incentive structures with CBDC's, americans could allocate a portion of their CBDC's for "bond allocation" for a certain time period, say 5,10,15,20 years and then you could pay them interest with more CBDC's and charge them penalties for early withdrawl. Boom, synthetic bonds and a GIANT jump in "synthetic bond demand" while reducing risks on a run and taxing it if it does occur.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Reduce Moral Hazard, Systemic Risk, Create a direct pipeline for monetary policy at the citizen level and expand the tools the fed would have to affect consumer spending. Seems good to me.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Well if implemented properly you eliminate the possibility of bank runs forever, the dollar stays as the dominant reserve currency for the next century. On an ancillary note, issuance of a CBDC would fulfill the demand for a CBDC which is now being proxied by crypto-currency speculation and numerous digital currencies that are pegged to the dollar. Issuance of a CBDC would severely harm the value of those currencies in the future, this is not to say that it would eliminate it, the value of crypto-currencies to money laundering institutions and drug cartels is immense in the digital age – but isolating and labeling third party currencies as common refuges for illicit funds and subsequently scrutinizing them heavily would cause their value to drop. A major drop in value followed by heavy auditing would make it difficult to pull cash out and turn the assets illiquid. In the far future there will be a digital dollar, centralizing its record would make it very difficult to launder.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

CBDC's make the financial sector un-necessary for wealth storage, if implemented properly with associated individual accounts linked directly to the federal reserve, it would make wealth storage through banking optional. It's difficult to imagine a CBDC service banks could leverage which would be profitable, there would be a significant decline in margins for financial institutions. Lending rates would likely go up, and it's unlikely that checking and savings accounts would disappear, their interest rates would probably go up to entice consumers to park their money outside of CBDC's. Lending margins would probably become extremely slim in an attempt to compete which would create a more direct and transparent stake for a consumer when they allow a bank to hold their money. A CBDC would be more directly and quickly impactful than a stable-coin. Most individuals investing in stable-coin today do so through third party institutions, this means that whatever bank is giving them claim to the stable-coin is still probably investing their money in one way or another. If they have an independent wallet investing in said coin then it would be outside of the bank's management, but a massive shift to this type of wealth storage is unlikely.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Any tools used would proportionately diminish the positive impact, There was a suggestion somewhere to create CBDC's but then prevent direct consumer ownership of them. What are you even doing at this point? You could try to limit the amount of CBDC's held and that would probably push people to other methods of wealth storage or just competing CBDC's depending on the economic environment.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

No, the Fed should just wait for the US banks to create their own digital currencies along with all of the other crap out there. We killed the national bank in 1811, let's kill the coinage act in 2022.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

This really depends on external governmental decisions and the modeling of any foreign

CBDC's and the currency strength of a competing CBDC. The ECB is considering a digital Euro and if it is issued successfully and made openly accessible it is my firm belief that it would have the ability to supplant the dollar as a reserve. Consumer accessibility would be fundamentally critical for any nation – backed digital currency. A digital euro that's centrally regulated would be an extremely easy and dependable wealth store for external consumer investors. It is difficult to imagine why any reasonable American investor would prefer to maintain the bulk of their assets in American dollars with all of the related banking risk if there was a nationally backed digital currency which was easily transacted. That's the game in essence, if an institution with a powerful pre-existing currency decides to digitize before the dollar and does it in an accessible manner then there will be a seismic consumer shift if not domestically then abroad. The question then becomes why use localized currencies at all? Cash usage is dropping precipitously, some institutions are starting to flat out refuse it or have made it impossible to use in the first place. Every once in a while a country will have a monetary mishap and experience hyper-inflation. The currency that people switch to at that point is a true indicator of the control. In the past it would be dollars in Venezuela, but dollars are hard to access – you need to go out and buy them or have bought them early before your hyper inflation. Now it's 2025 and your country is going through hyper inflation, but you're not impacted by it much. Your phone is already wired to an ECB account, you've been dealing in euros for the past year – it's easier to buy things online that way, and no-one is regulating all of the third party sites that send you things anyway, even if they did your money doesn't lose value – and the stall owner down the street is accepting dollars or euros and you're in no mood to go shopping for dollars.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The moment another large economy nation decides to create an open and accessible CBDC, the U.S. will already be behind.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

The Fed should be more agnostic to profit margin risks of private banking institutions,

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Centralize the CBDC consumer accounts with a decryptable hash and store the associated keys offline Solely for Auditing.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Easy, make your CBDC a closed loop, prevent unregistered actors from transacting, make the CBDC open to registration with verification globally.

*14. Should a CBDC be legal tender?*

Yes.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

It doesn't really matter, Ideally yes – it should be structured to allow holders to opt into returns based on modeled synthetic treasury notes or bonds. This would incentivize lower income individuals to move to digital payments and allow them to easily enroll into programs that would lift some out of poverty. On the other end, banks could lose their profit margins when lending, and people with checking accounts would have higher interest returns for their investment and no-one wants that.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

No, you're just creating an ineffective instrument then. Would you limit the amount of cash someone can hold?

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

CBDC's should be centralized, intermediary firms should only exist to supplement transactions, if CBDC's are not centralized these firms should be required to only supplement

free transactions.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

This is called cash.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

CBDC's should be auditable, centralized, and reversible. Many issues exist with crypto models which for some reason were mentioned in the experimentation section. If a CBDC transaction is irreversible it is impossible to safely transact because numerous issues could occur at the point of sale making their usage unreliable. Intermediaries could act as trusted authorities for transaction reversal.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

You have an account with an associated key, The intermediary platform picks up the key and queries for a value, if the query returns true it sends a subsequent transactional request for said value.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

CBDC implementation will catch on as necessity for large external economies, creating openly modeled CBDC's that can be easily transacted will have significant competitive advantages for a national currency, if the Fed was really invested in creating CBDC's and modeling for the future then creating a CBDC exchange and making CBDC's convertible would allow it to maintain a first mover advantage after the international community follows suit.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Just bring back the national bank, a digital central currency demands it, please for the love of God – if Europe moves on an open digital currency before the U.S. the dollar is gonna get blown out.

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*Name or Organization*

*Industry*

Individual

*Country*

United States of America

*State*

Nevada

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Security of the system. It may be easy to take the whole system down with an EMP or massive solar flare. It might take time to bring it back up. In the interim people would not be able to even buy groceries. That can happen now, but with physical currency transaction can still occur.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Not sure

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Yes. It would be of great cost to update all systems throughout the country. Like all software there will be bugs and hiccups. It takes years sometimes to get a perfect or seamless working piece of software. This is a major undertaking and I can see with some small bugs within the software trillions could disappear.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

It obviously would allow the government to track funds for taxation seamlessly. Not sure if economy can survive the current inflation long enough to implement. People are falling out of work, because they just can't get ahead of the inflation. Young adults are entering the workforce later and staying with their parents longer.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Not sure it can. Look at Bitcoin. It is a very volatile currency. I think with a world full of hackers it might be vulnerable.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

If system goes down it will effect the entire financial sector. It is putting your eggs all in one basket. Right now each bank has their own systems and accounting. This sounds like it will be controlled by a single system within the FED. All systems that are written in code/computer language are always susceptible to errors, hacking, and failure.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

I think some sort of physical currency is always important. Even if power grids go down for a time, people will not be able to have commerce.

*8. If cash usage declines, is it important to preserve the general public's access to a form of*

*central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

I think this is the best argument for CBDC. It would cut out all the currency exchange rates and cost to exchange currency. It could be an easier process.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

I think cyber risks will be the biggest challenge for CBDC. As I said before if it is written in software someone out there can hack it. I also think we have a very fragile electric grid within the US and other countries. It will become even more fragile as we try to eliminate fossil fuels and carbon. A terrible winter in Texas brought down their grid. I think there are a lot of factors in trying to change everything too quickly. The massive drought in the west will also effect the grid in the west. A lot of their power is generated through dams. If there is not enough water to fill the dams power will not be generated. We will also be tasking the current power grids as we all be electric cars and are charging them constantly.

*14. Should a CBDC be legal tender?*

Yes

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

I think this will be the end of interest.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

I

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes. There are areas all over the United States that do not even have cell service. Small businesses have to use the internet through satellite.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The Board has rightly identified several policy considerations and risks. In our EPAA Position Paper No. 1: CBDC we supplement these. One of the big risks, posed even without CBDCs, is the disruption of the money system. A lack of confidence, accessibility, and convenience of the money system can create rival systems, or worse negatively impact the free-flow globalisation of commerce we have today. In addition, the Board should consider a US CBDC, like the US dollar, as core to an international money system. This means integration with other CBDC/money systems, and at some level, acceptance of alternate systems and users. Exclusion of participants on political grounds is problematic, and it is important to remember the architecture of the current system in the aftermath of two world wars. It was not possible for any government to control who could hold and exchange their paper notes, and it is perhaps wise to draw the conclusion, that the mutual support provided through those policies has led to global commercial integration, development (through the IMF and World Bank) and more importantly, the relative peace that we have enjoyed for 80 years. The implication of our suggestion is that the US should seek to consider an International CBDC system that would allow emerging powers to accept and play on the same field, and obtain a security of their deposits. At a minimum this may be international CBDC integration. With retail CBDCs it may be possible to centrally issue what is today private money. This may improve financial institution lending regulation, but at the same time reduce the potency of private banks that have supported economic growth across the globe. Finally, the innovation potential of a CBDC is too numerous to enumerate here, we have some in our attached position paper. Central banks should seek to architect a CBDC system so that it could, if desired, expand into different innovative areas, accepting a risk of trial and error.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

In its simplest form CBDC is an extension of electronic money, and by itself electronic money is evolving to be similar to digital currencies. Popular blockchain is decentralised in nature, so a centralised CBDC may not benefit from an open ledger, as much as a cryptocurrency does. Consideration should be given to high availability, and particularly offline transactions.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Clearly a CBDC could impact financial inclusion depending on implementation. There is a move to better identity of account holders. Non-legal entities, and people seeking to receive payments without the knowledge of authorities may seek alternative payment systems. Maintaining paper cash could solve the problem in the short term, but the decline of cash may wedge this population out of the system. While this may seem like a desired outcome, without social policies to resolve (for example) illegal immigration, tax avoidance and money laundering, an alternate network may emerge. On the other hand, CBDCs could positively impact financial wellbeing for the disadvantaged population. It is worth reflecting on the US Declaration of Independence, and the founders desire to eliminate tyranny by design. Indeed, many of the problems that gave rise to independence was to do with greater government visibility and intercession of transactions (e.g. stamp duty and taxes). A CBDC, poorly designed, could increase central control, and result in greater inconvenience. This is not to discourage a US CBDC, for CBDCs are inevitable. This is to encourage a well-designed system with decentralised checks and balances.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

A centrally controlled CBDC can enhance the Federal Reserve's ability to implement monetary policy, especially when interest rates are low, and that lever has reached implicit limits. Examples include CBDC sub-accounting, or CBDC labelled for different purposes (food, health, accommodation or investment) with expiry to assist an economy recover where it is required – immediate employment, without impacting longer term inflation. A CBDC can still be used to control monetary policy in the traditional way, and increasingly it can be used to implement fiscal policy.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Financial stability is founded on the market knowing what will come next. Intrinsically a CBDC gives greater control to the issuer, so this adds a level of uncertainty to the market introducing a possibility of instability. Greater monetary control that CBDCs offer can counteract existing risks in the current money system, however, as before, stability is based on the perception and confidence in the government and regulator in seeking to maintain a stable financial system. However, it should be noted that now more than before, there is a risk that external system influences financial markets more in the future, so a robust and well adopted CBDC system that seeks to provide greater benefit than alternatives, if properly governed, would net increase market stability.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

A CBDC in its simplest form as a wholesale Federal Reserve balance can do little harm. If it were a retail currency, and if it encompassed private bank issues money, the risks of the currency impacting the sector increase. If the Federal system takes on more deposit and lending activity from private banks, this will at least impact those institutions directly. Hypothetically if the CBDC was decentralized, or existed independently from centralized systems, say as a signed or hashed cryptogram, and that system were to be hacked by a quantum computer, hypothetically, this could adversely affect the financial sector if there were no mitigants. In the design of a CBDC, care should be taken so that adverse effects are minimised, even if risks materialise.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

We list a few mitigants: Wholesale CBDC only : No retail benefit. Questionable business case for CBDCs Centralised online ledger: Does not work offline, risk of central outage Non-integration with other digital currencies: May result in a superior non-US CBDC solution, diminished value of the US dollar Continue cash: Limited benefits of ubiquitous CBDCs Quantum-proof design: We have learned that no system is immune to security threats Anonymous CBDCs: Problems associated with cash continue (money laundering, terrorism financing, etc) KYC identification of holder: Does not support anonymous payments – could allow a secondary system to emerge to support illegal payments Implement a like-for-like CBDC system to replace existing: Reduces innovation

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Electronic payments today exist largely as promises-to-pay between private institutions, and for the general public there is little or no concern of systemic risk for payments. The big risk for consumers is that their savings remain intact, and they can always access it to make a payment. This guarantee from the government, whether written on a paper note or guaranteed in law is perhaps equivalent.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Despite its popularity Bitcoin and other crypto-currencies have failed to replace traditional means of payment: local or cross border. The work done by the Financial Stability Board (FSB) looks positive in improving cross border payments. US CBDCs will nevertheless need to interact with other CBDCs, either through existing payment rails or new ones, so the introduction of a US CBDC will do little. If the Know-Your-Customer problem (KYC) is handled by governments through nationalised but decentralised digital identity systems, through

payments between individual retail international CBDC accounts, and cross border payments are checked by regulators at the border, this will remove a major headache and source of regulatory (and through the threat of fines, private institution) stress. It could create a global walled garden where people could freely exchange money, institutions did not need to screen, individuals could maintain some privacy, and national systems ensured individuals are legitimate, and money transfers are tracked for tax, and policing purposes. Without CBDCs the task is possible, but more difficult as KYC continues to be handled by private institutions, as it is today.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

CBDCs are in an early stage of experimentation, so some domestic diversity of implementation may be recommended. If it proves successful, it is imperative that interoperability be given some thought, to enable a few use cases: Cross border institutional payments Cross border retail payments Central bank currency reserve integration Domestic payments and savings utilising alternate digital currencies and assets An international CBDC/currency, e.g. Banker potentially for retail not just sovereign settlement

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

The biggest risk is during an experimentation phase. Smaller geographies such as smaller countries, smaller states or localities should be allowed to experiment to find suitable facets of CBDCs that can be consumed for broad adoption. Consideration should be given to an overarching decentralized digital currency framework, with US CBDCs issued in a similar way to current US Dollars, however states, localities, corporates and even individuals allowed to issue their own digital currencies as a “promise to pay” that is rolled up into larger DC instruments once cross-network payments are required, or if the promise needs to be underwritten by a more robust authority. This mechanism can be used to roll-up into an international framework, with each cell given the freedom to innovate and explore local benefits of digital currencies autonomously.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Using a decentralized identity framework, such as that established by the W3C, decentralized identifiers (DID)s currently trialled by the US Dept Homeland Security's SVIP, the European Union and others – so that the identity of the CBDC holder (or DC holder) is known only to the issuer, with privacy protected by law, so that for general payments the identity need not be known, and where there is a need for identity, say for delivery versus payment use cases, or even retail refunds, a privacy preserving verifiable credential can be provided.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

As a premise, it should be assumed that nothing is hack-proof. A CBDC would likely be issued on a centralised (or private) ledger. This provides a layer of protection such that the network could be locked down and isolated in the event of a breach. CBDC design should accept that Quantum computer capability could be available at least to national governments at a point not in the distant future, so the solution should be Quantum computer hack-resistant. Algorithms such as SHA 256 have proven to be robust, but this level of robustness should be exceeded for a US CBDC. There should always be recourse in the event of fraud or error, so a decentralised system for CBDCs may not be advisable (notwithstanding that it is possible for a centralised CBDC system to operate within a decentralised system).

*14. Should a CBDC be legal tender?*

There are several aspects to legal tender that should be considered, as the term is not well defined. We avoid dealing with the definition issue by focussing on use cases involving legal tender. (i) First that the receipt or payment of CBDC is equivalent to the payment of money for US Federal debts. (ii) Second that the receipt or payment of CBDC is equivalent to the payment of money for state, corporate and individual debts in US jurisdiction. (iii) Third that the recipient must accept a CBDC payment (if offered) for the resolution of a monetary debt. (iv) Fourth that the recipient can demand a CBDC (and no other) as payment for the resolution of a monetary debt. (v) Can a debt be settled without CBDCs? For a time CBDC payments will co-exist with other forms of money so an early mandate of (iii) and (iv) may be envisioned but not practical. Indeed in practice, it is the case today that current legal tender

(paper notes and coins) is not always accepted practically as payment especially online. Implementation of (i) and (ii), at least legislatively seems fair. As for (v) there should always be alternative mechanism to settle a debt, whether they be monetary or non-monetary.

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

On behalf of the below-signed individuals and 10,988 co-signers, FreedomWorks Foundation appreciates the opportunity to offer these comments regarding the Federal Reserve's request for public input on implementing a central bank digital currency (CBDC). The rise of digital assets is a revolution in the digital and financial world; for the first time, individuals can make direct money payments across the globe at the speed of the internet. The widespread use of digital assets would allow consumers to transfer money near-instantaneously rather than rely on a series of intermediaries to conduct a single transaction. It is, however, essential to continue a robust cash economy where consumers can enjoy the benefits of financial privacy.

John Tamny Vice President Director of the Center for Economic Freedom FreedomWorks Foundation Beverly McKittrick Director of the Regulatory Action Center FreedomWorks Foundation Kilian Laverty Policy Assistant FreedomWorks Foundation

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

There are currently numerous products such as stablecoins, digital assets whose value is pegged to a fiat currency that can satisfy the needs of consumers and bring our economy into the 21st century. Stablecoins can lower payment costs, increase payment speeds, and promote access to the payment system. Despite stablecoins revolutionizing the digital asset marketplace, the President's Working Group on Financial Market's (PWG) report on stablecoins is catalyzing a push by government officials to crack down on stablecoins, and craft new regulations and erect barriers to entry. The attack on stablecoins is inseparable from developing a CBDC, a state-sponsored substitute that would crowd out private-sector competition. One of the most significant features that draw people to digital assets is decentralization. There is no central authority that manages the supply and value of most digital assets. Instead, most digital assets democratize their management amongst their users. A CBDC runs counter to this premise.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Unlike existing forms of digital money, a CBDC would be a liability of the Federal Reserve. If the Federal Reserve were to issue CBDC in an account-based model, consumers would hold deposit accounts directly with the Federal Reserve. This would, in effect, mobilize the Federal Reserve into a commercial bank. A CBDC would fundamentally change the structure of the

U.S. financial system, altering the roles and responsibilities of the private sector and the central bank. A CBDC can undermine our current banking system that relies heavily on deposits to fund loans. A widely-available CBDC would serve as a close or near-perfect substitute for commercial bank money. Reducing aggregate deposits into commercial banks will inevitably reduce access to credit and increase costs.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The Federal Reserve's exploration into CBDC raises serious questions regarding the continued development of the digital economy, consumer privacy, and the eventual transition to a cashless system of payments. The United States must not follow countries like China down the path of digital authoritarianism but instead preserve a payment system that promotes consumer privacy and security.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

The implementation of a CBDC in the United States would fundamentally change the United States' financial sector and pose serious concerns. Creating a CBDC that does not enjoy the same anonymity benefits of cash will open the door for large-scale abuses and should not be implemented in any way by the Federal Reserve. The United States must move our economy into the 21st century by embracing the rise of cryptocurrencies and other digital assets but cannot forsake consumer privacy in doing so.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

A CBDC is a hazardous tool that could pose significant privacy concerns for American consumers. A widely-used CBDC would create a trove of financial data in the same way that commercial banks and nonbank entities do so today. The account-based model of CBDC leaves consumers vulnerable to government abuses and the security risks of a single centralized point of failure. Any United States CBDC would need to be issued in an intermediated model that would provide a degree of separation between consumers and the central bank. Any CBDC implemented must offer the same convenience of cash and the same privacy protections. Traditional cash payments provide consumers with a wide range of benefits from privacy to personal autonomy. Physical cash is the only form of payment that does not require a third party such as electricity or an internet provider. This, coupled with the benefits of privacy and anonymity, supply an invaluable service to consumers that CBDC cannot replicate or replace.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

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20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

While the Federal Reserve's paper has not expressed a specific preference between a "general purpose" or "intermediated" CBDC model, it should be noted that the selection between the two will pose significant policy considerations. For example, the history of the Federal Reserve indicates that direct-to-consumer relationships are not preferred. If any, there is a preference to preserve the two-tiered banking system. Taken together, this suggests that an intermediated CBDC is the preferred model. Any CBDC will need to be an extension of the existing banking system to avoid disintermediating current credit and financial service providers while protecting the financial system's liquidity. To achieve offline transactions and other features that mimic cash, an intermediated CBDC model needs to strongly consider the means by which the consumer uses and accesses the currency without intermediated custodial accounts. This also includes the opportunity for consumers to receive instant access to government payments through intermediaries in the case of financial emergencies such as stimulus checks and relief aid. Additionally, CBDC should, and must be designed such that programmable features used by software in place at the banks (or other prudentially regulated entities) capture key digital identification considerations. (Please see responses to Questions 3 and 12 for more details on the importance of capturing digital identity in the discussion.)

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

All of the potential benefits of a CBDC could be better achieved through file-based programmable money (digital cash) technology in an intermediated CBDC model versus through stablecoin technology. The use of the term "file-based programmable money", refers to a fixed-value denomination file that includes a non-malleable cryptographic proof of historical ownership. This file could be issued against an issuer's account reserves held at a monetary authority, or it could be issued by approved delegated currency issuers (DCIs), which include financial intermediaries such as commercial banks. In this type of solution, these files would be direct liabilities of the monetary authority and a form of CBDC.1. The primary benefit of file-based programmable money is that each bill is its own individual ledger and can be passed from user to user, just like cash. This individual ledger design allows for increased scalability and security. Other benefits include confirmation that the money is not double spent while transactions are ACID+D (atomic, consistent, isolated (concurrency-protected), durable, and deterministic, with specified and guaranteed service levels: 99.999% uptime), 24/7, and near-instantaneous; capable of facilitating offline transactions; interoperable with financial standards (e.g., ISO-20022, SWIFT, NACHA) and payment networks. For the CBDC to be operational, it is essential to solve the problems associated with double-spend and double-credit attacks, enable offline payment capabilities and create a barrier to illicit finance. The primary benefits of cash are its value as a widely accessible means of non-account-based payment, which file-based programmable money can achieve. A CBDC should extend the benefits of a bearer instrument, a non-account-based system, by allowing for large and small transactions to be facilitated for people of all socioeconomic backgrounds, across borders, and at all times. A CBDC should also enable proactive monetary analytics of the modern economy and its participants. For a CBDC to be suitable for global economic use, solving the problems associated with double-spend, offline capabilities, and creating a barrier for illicit finance are essential. Other proposed improvements to the payments system focus on widespread promotion of faster database processing. For example, FedNOW promises improvements to faster processing with its improvements to FedWire but relies on legacy ways to think about batched ownership of currency and increasing the

throughput of just one database. These proposed improvements, however, are seeking to expedite the wrong process. The way to speed up settlement without sacrificing precision and safety is through a narrower focus on the potential of file-based programmable money. In contrast to the kind of improvements offered by FedNOW, file based programmable money captures ownership and transfer data. More specifically, file-based programmable money allows each dollar bill in circulation to be its own ledger, a cryptographic proof with embedded settlement and transaction history. Furthermore, the file-based programmable money would be backed by reserves necessary for the relevant regulatory regime (e.g., bank deposits, etc.). A vital characteristic of file-based programmable money is its ability to be interoperable with existing, emerging, and updated financial standards (e.g., ISO-20022, SWIFT, NACHA) and different payment networks, which preserves monetary sovereignty. See response to Question 20. 2. Capturing only bill-based information solves privacy concerns associated with consumer usage of CBDCs. Relying exclusively on bill-based information that does not include PII/consumer information for traceability means having an intermediated CBDC designed as file based programmable money. The system should be designed with self-sovereign identity in mind. For example, the data and analytics on the bill itself should be pseudonymous, separate from the consumer's data. Analytics can be extracted at the bill level and prove helpful in tracking net-value volume flows between participants, calculating holding periods for each digital dollar for historical owners, and generating information for suspicious activity reports, among other use cases. User identity must be kept separate to avoid a surveillance state. A digital identity solution that captures the PII and any KYC requirements necessary for a transaction should be done in a privacy-enabled way through encryption techniques such as zero-knowledge proofs. Consumers or the relevant banks will hold PII directly and share in a secure manner upon consent. In sum, the potential benefits of a CBDC are achieved with programmable features attached to the digital dollar that are generally exchanged through the retail environment. Exchanges between central and commercial banks occur with a set of universally recognized standards for digitized money (like ISO-20022).

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Yes. With the right design, an intermediated CBDC with the features of file-based programmable money could significantly increase financial inclusion. To maximize financial inclusion, the CBDC should prioritize a mobile-first, person-to-person design that can work within the existing two-tier banking system. By focusing on people first, the CBDC could achieve a means by which central banks, commercial banks, and consumers can transact with one another seamlessly. Importantly, to be inclusionary, the CBDC needs to be designed in a manner that is not account-based and includes offline transactions, allowing for properly KYC'ed nationals/foreigners and the unbanked to hold CBDC. An extra benefit of this approach is having the option to use an embedded digital identity solution for the consumer that captures the PII, and any KYC requirements necessary for the transaction in a privacy enabled way (through encryption techniques such as zero-knowledge proofs). This way, consumers can own their data, and when they choose to share that data, it is done so with minimal exposure. However, a financial institution may choose to leverage their existing digital identity solution when using file-based programmable money. As noted in response to Question 2, it is necessary to preserve the anonymity of today's cash transactions (whether by choice or necessity of consumers) against the need to prevent illicit financing with a CBDC through bill-based captures of information. While a non-account-based CBDC should allow individuals to hold U.S. Dollars on mobile devices without the prerequisite of a bank account, the importance of commercial banks and well-regulated financial intermediaries cannot be overstated. Their role should and must continue. The design of any CBDC should create the opportunity for commercial banks and financial intermediaries to play a significant role in the distribution of CBDC into the economy. Additionally, any consumer who is un- or under-banked has access to well-regulated financial products and services from the traditional banking sector. We see a well-designed CBDC as one mode that could drive inclusivity for those on the system's periphery to seek access. Put simply, a CBDC should not dis-intermediate the customer relationships commercial banks develop and use to make informed credit lending decisions. Nonetheless, the intermediated CBDC with file-based programmable money features should not require a bank account to hold and transact.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

N/A

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

If appropriately designed as an intermediated CBDC with file-based programmable money features, the effect of CBDC on financial stability would be negligible. A CBDC should not include features that would hinder the U.S. Dollar as a store of value and safe-haven asset.

Such features, such as a restriction of the amount of CBDC able to be held, would be antithetical to what the Dollar is today. Outside of a CBDC, capital controls can be used to ensure the safe flow of funds between financial asset classes in a financial crisis. One key advantage to a file-based programmable money system is that it will help financial stability by giving the Fed access to real time information that may help it make timely and critical policy decisions. In particular, file-based analytics can be extracted through time stamps and public key information. This capture helps track net-value volume flows between participants, calculating holding periods for each file for historical owners and file suspicious activity reports, among other use cases.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

CBDCs affect the financial sector differently from stablecoins or cryptocurrencies because CBDCs have credibility inherited from the trust that the public already has with the issuer, the Federal Reserve. In contrast, stablecoins and cryptocurrencies are largely unregulated, and there is no federal insurance for loss of funds. Stablecoins present additional risks, including loss-of-value risks via stablecoin runs or fire sales, lack of a consistent set of regulatory standards, on top of traditional payment system risks, such as credit risk, liquidity risk, operational risk, and settlement risk that are not present when the coin is issued by a well-regulated statutory body that represents the full faith and credit of the U.S. The base risk of all stablecoins relative to CBDC are compounded by risks presented by the three predominant forms of stablecoins: algorithmic, collateralized, or both. An algorithmic stablecoin may struggle to maintain stability as it relies on uncontrollable factors such as market demand, incentives, and pricing. Collateralized stablecoins come with an inherent incentive for issuers to invest the assets, creating risk related to the speculation appetite of the issuer. Or, if the stablecoin causes the loss of retail deposits and the reserve assets that back stablecoins do not support credit creation, at scale the use of stablecoins could increase borrowing costs and impair credit availability in the real economy, as the President's Working Group pointed out in their November 2021 document. A stablecoin that is algorithmic and collateralized will likely suffer from these sets of additional risks. Unlike a stablecoin, CBDCs are an accurate representation of the value of the U.S. government (or other international sovereigns issuing them). As observed in the current Russia-Ukrainian conflict, geopolitical conflict may impact the value of the sovereign. Some stablecoins will not correctly represent this geopolitical risk such that they may be immune or diversified enough to the point that political and economic sanctions regime impacts are muted. CBDCs may be desirable relative to stablecoins simply because they reflect the actual, real-world positions of the sovereigns that have issued the CBDC. Barring international political conflict (of which economic sanctions of unknown impact are assured), CBDCs, on the whole, are a more solid and reliable form of value exchange than their stablecoin counterparts. Because they are tightly regulated and limited by explicit statutory authorities, a CBDC issued by the Federal Reserve or the Treasury shall include the safeties and risk mitigants necessary for a national currency.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

In a file-based programmable money system double spend attacks and insertion of counterfeit files cannot happen when the relevant cryptographic signatures are checked prior to settling a transaction. In a situation where a participant cannot check the cryptographic signatures prior to settling a transaction, for example, in an offline situation, there are several features that can be used to minimize adverse consequences. For example, the system can limit file-based programmable money transacted offline, by only allowing a single transfer before needing to connect back to an authorized signature (e.g., commercial bank or monetary authority). This is described as a "single hop" offline transaction.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes. As society becomes increasingly interconnected both online and offline, governments should have a financial instrument that can offer similar benefits to cash while capturing the consumer preference for electronic, non-account-based payments. A CBDC should co-exist as a viable format of U.S. currency. A well-designed, intermediated CBDC with file-based programmable money features should enable low- or zero-cost transfers without requiring individuals to maintain a bank account for participants to transact. Such a CBDC would allow anyone in the world to accept U.S. dollars versus only those who have a U.S. dollar-based bank account. This cash-like quality is vital for the CBDC because it ensures that the U.S. dollar maintains its use as a world reserve currency and a unit of exchange for international business. The government should sponsor, but need not develop, such a system to ensure

adequate financial oversight and controls to guard against private variants of the U.S. dollar, which may introduce fraud and settlement risks in the global financial system. Working in conjunction with government agencies, private sector developers can undertake the technical work necessary to facilitate such a solution. Government agencies can ensure that critical public needs are adequately served, and equities met through public policy guidance.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

N/A

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The United States does not want to be forced to follow the decisions made by other large economies and nations that may issue a CBDC. Delay in developing its own CBDC will allow nations with other models to advance ahead of the United States, potentially leading to solutions that disfavor U.S. policy priorities and U.S.-based private sector leadership. Instead, the United States should play a decisive, timely, and leading role in this area, focusing on interoperability, privacy, security, and scalability of any CBDC. The United States is also well situated to focus on ensuring any CBDC works well with private-sector innovations. It will be critical for the United States to think globally when analyzing the opportunities created with CBDCs, including global credit access and interoperability with traditional and emerging financial standards (e.g., ISO-20022, SWIFT, NACHA). In a world in which commerce is increasingly global, it is crucial to develop an interoperable model compatible with other CBDC solutions that may have varying degrees of privacy, governance standards, or security precautions. The U.S. government should work closely with emerging US-based private sector leaders, various international organizations, trade blocs, currency unions, and regulators to establish global standards and interoperability definitions for all CBDC systems.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

N/A

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

A CBDC that continues to use the current banking system's identity verification can provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity. Moreover, current technologies that can be integrated with file-based programmable money provide the ability to have traceability/bearer PII information owned by consumers directly and that is accessible at an encrypted level to third-party intermediaries and commercial banks. As noted in response to Question 2, is it important for any solution to strike the balance of preserving the anonymity of today's cash transactions (whether by a consumer's choice or necessity) against the need to prevent illicit financing with an intermediated CBDC with programmable money features. A key benefit of file-based programmable money features is that transactions can happen anonymously, yet there is a mechanism to access relevant PII if a financial institution needs to do so for various regulatory or other legitimate reasons. In that response, we emphasize the CBDC issuer (Treasury or the Fed) would have access to settlement information and transaction history, but not the PII of the consumer/bearer. Separating the bill-based transaction and settlement interest from the PII of the consumer-bearer fits well within the use of a two-tiered banking system. The PII information is captured by the wallet authorizing third-party intermediaries, and commercial banks are permitted to access and limit controls within those institutions to a set of individuals. This partitioning of access built upon the idea that transaction and settlement information is captured on the bill itself, and the wallet would capture the PII, KYC, and AML information. The benefit of this partitioning of access would provide relative anonymity at the transaction level but allow for oversight and disclosure when the appropriate legal thresholds were satisfied. Data privacy, pseudonymity, and data security features can be obtained by implementing best-in-practice technologies developed and used in the private sector without involving the CBDC issuer (Treasury or the Fed). File-based programmable money, will offer these features and help solve these critical issues. Consumers interact with pseudonymity and cryptographic proofs in this system while keeping sensitive data in the wallet. The consumer will have full data ownership over the information in the wallet. The consumer opts in to send cryptographic credentials out of the wallet to banking providers through zero-knowledge proofs. Each file preserves the pseudonymity of cash within this architecture no matter who the owner is because this is not an account-based system. However, analytics can be extracted from the file-based programmable money through time

stamps and public key information. This capture helps track net-value volume flows between participants, calculating holding periods for each file for historical owners and file suspicious activity reports, among other use cases. We suggest the US government embrace file-based programmable money in concert with consumer-held and controlled cryptographic keys, pseudonymous with digital identities, as a technical solution that affords the ability to have essential data privacy and security and the ability to unmask transactors where and when it is needed and only after the legal necessity for such unmasking has been demonstrated by proper authorities.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Although cyber threats are already a part of the current payment, clearing, and settlement system risks, introducing a retail CBDC would present an entirely different cyber resilience challenge, especially as such a CBDC model is likely to be open to a vast number of participants. This exposure could make the system more vulnerable as it provides multiple new points of attack, including the impact of cross-border CBDC payments on AML/ CTF requirements. A variety of novel cyber attacks will be introduced, as is common with any new, large-scale system that facilitates the flow of vast sums of money. While some of these risks are unavoidable, various system design choices could mitigate their impact. An important design feature of a CBDC may require new thinking about database sharding and replication, networking, and transaction durabilities, among other considerations. With file-based programmable money, each file contains its unique cryptographic record of ownership that any bank can issue with legal reserves and transfer without a central accounting system to increment and decrement balances of holders. This enables better privacy and security. The actors only know individual balances of the system who need to know, e.g., the monetary authority, commercial bank, and the individual. Files allow for illicit activity to be caught before a transaction takes place because the files can be cryptographically verified locally to prove whether the file is legitimate. The fact that files are held locally improves the speed, scale, and throughput of the system with fewer downtime risks. This private-sector technology also fosters operational resilience improvements with offline transaction support, unbanked support, and interoperability with emerging financial standards such as ISO-20022.

*14. Should a CBDC be legal tender?*

Yes. To be considered a valid substitute for physical cash, a CBDC should be an acceptable form of payment for general obligations, including retail transactions, taxes, or settling debts owed to creditors.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

No. An interest-bearing CBDC could start to compete against existing depository institutions (commercial banks) and reduce demand for existing financial instruments (e.g., money market funds or treasuries) that serve this purpose today. A non-interest-bearing CBDC could also encourage innovation in the private sector, incentivizing the creation of various CBDC-based financial products across emerging protocols.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

No. Placing a limit on the ownership of money prevents CBDC from becoming a safe-haven asset. If the market cannot freely express short-term risk preferences due to an inability to transfer funds, the functions of a free market are jeopardized. Instead, commercial bank issuance limits and individual transfer limits are better suited to mitigate high-volume outflows that may pose risks to various markets and asset classes or cause other financial system instabilities.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Preserving a two-tiered banking system is necessary. Commercial banks should continue to own the relationship with the customer and play the role of distributing CBDC into the general economy. Commercial banks should provide delegated authorization on transfers of file-based programmable money between end-users as a low or zero-cost service. In exchange, the commercial bank is permitted to issue and distribute funds through lending products and other financial services (e.g., remittance, foreign currency exchange). The monetary authority or central bank may also provide authorized signatures on files and should perform this service at no cost.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes. CBDCs should have offline capabilities. CBDCs should be designed to achieve similar features as physical cash with as minimal drawbacks as possible in comparison. Because physical cash can be used offline, so should CBDCs. The best design for a CBDC is an intermediated CBDC with file-based programmable money features. Please see the responses to Questions 2, 12, and 13 for more information about how these features help to balance privacy and security interests. While offline transactions open risks of double spending in the system, file-based programmable money that can provide sufficient mechanisms to guard against those liabilities within the financial system, and bad actors can be sanctioned and prosecuted. Further, the victims of fraud or point of sale purchasers seeking recourse should be able to avail themselves of the same or similar protections afforded to today's card users who may be unsatisfied with purchases. A similar framework of consumer protections would be necessary and likely need to be attached at the financial intermediary level- the consumer wallet level and administered by a federal regulator like the Consumer Financial Protection Bureau, Financial Criminal Enforcement Network (FinCEN), or the FDIC. But more importantly, the offline capabilities of this system enable resilience to network outages (e.g. natural disasters) where connectivity is unavailable. There are various strategies that can be used to guard against exponential liabilities in an offline situation, including limiting the number of transactions that can be done offline.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes. A CBDC available for retail transactions must provide the speed and resiliency one expects from credit and debit card processors. The offline features of file-based programmable money enable point-of-sale (PoS) transactions despite events when a connection to the internet is lost. This is vital for situations, such as a natural disaster, which might otherwise restrict the transfer of value between consumer and merchant in PoS transactions that are capable offline. Offline transactions can be transacted over near-field communications (NFC) chips on smart devices available on the market today. Modern PoS terminals that are smart devices, such as phones and tablets, can adopt files with minimal changes to existing software.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Technologies that support platform business models, allowing third parties to build services on top of a CBDC system, are well established (e.g., use of application programming interfaces – APIs). The challenge in interoperating with existing payment arrangements will depend on their designs, but most have standardized mechanisms to make inter-account transactions. Support of both traditional and emerging financial standards (e.g., ISO-20022, SWIFT, NACHA), will likely play a part in enabling interoperability with other payment systems. In a CBDC system with intermediaries, its design will need to support payments (be it online or offline) between customers of one intermediary and those of another, while supporting portability to avoid users being locked into a single intermediary.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

The advent of quantum will pose a challenge to any CBDC. However, an intermediated CBDC with file-based programmable money features could go far to solve this problem. Specifically, the design of the CBDC as being contained in files could allow private-sector players, to future-proof the cryptographic files to be post-quantum resistant, providing interoperability with asymmetric cryptographic post-quantum techniques (e.g. isogeny, hashing) and standards as they emerge.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

A non-account-based architecture that does not rely on the strict ordering of transactions is the exemplary CBDC design choice for handling scalability challenges. Using the two-tiered nature of the banking system as it is today and leveraging commercial banks to be participants in operating the system allows for greater efficiencies in transaction throughputs and more efficient distributions of capital into the economy. We expound on the qualities of a well designed CBDC in responses to Question 2, 12, and 13.

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*Name or Organization*

*Industry*

Consumer Interest Group

*Country*

United States of America

*State*

Illinois

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

A CBDC Supporting Economic Harmony and a Vibrant Humanity on Earth This survey response aims to look at CBDCs within the context of the major challenges facing us today: pandemics, war, pollution, and climate change. The Fed needs a broader outlook with increased responsibilities to reach its potential to help combat all of these. Ultimately, the Fed will need to be aligned with other central banks and the BIS to work with governments and the U.N. to promote economic harmony here-to unseen. While CBDCs will be a focus of this paper, digressions will be commonplace. It is hoped this can be the start of a deeper relationship to look at the possibilities for a better world. Not raised in the "Money and Payments..." paper is how a CBDC comes into circulation. One way is for money to be initially issued/created through a loan or investment on the part of a commercial bank. A depositor at that bank withdraws money, moves it over to their Fed account, and obtains CBDC. Another way is for the Fed to decide how much money can come into existence. That amount of money can be purposed by Congress to be loaned or spent into circulation. The American Monetary Institute (AMI) policy is that commercial banks are to be weaned off all credit-originated money and indeed become true intermediaries between depositors (who want to invest their money at interest) and borrowers. At this point, the Fed would have greater influence and control over the amount of money - digital and paper money - in domestic circulation. We can call the Fed originated money social equity money for educational and practical purposes. It need not be considered a liability but definitely would have to be issued in that sweet spot between inflation and deflation. Along this path one scenario (and there are other viable possibilities) for how deposits at commercial banks can be handled is as follows: depositors would have a choice to earn interest or not. Depositors wanting to earn interest would be told they are making an investment, and investments involve risk. Depositors still interested in investing could choose to obtain a high, medium, and low-interest rate for their investment. For example, investing in uncollateralized credit cards would earn a high-interest rate. Investing in people's collateralized mortgages could earn a medium interest rate while investing in commercial paper with certain preferred guarantees might earn a low-interest rate. Depositors not wanting to invest would have their deposits given over to the Fed, and that money would be held there, and the need for FDIC insurance would cease to exist. Besides these efficiencies and cost savings, other benefits will be laid out in the rest of this survey. One huge benefit would be that Treasury Bonds, Notes, and Bills would no longer be necessary, as the Fed could create this money. The government and taxpayers can save crucial money by not paying interest on Treasury securities and thereby stay out of debt to private investors. Businesses and other financial institutions are now dependent on Treasury securities to meet various financial requirements in our present world. These markets can wind down, and other mechanisms can be put in place to replace Treasury securities. How would all these adjustments be made? How much money could be safely created to keep the economy safe between inflation and deflation? How could the U.S. citizens be protected from the whims of Congress wanting to create too much money? How should we think about money for employment purposes and getting the needed money around to all the sectors of the economy? For better or worse, the Fed is at a crossroads with choices. The choice to go forward in this direction would give the Fed an educational role, policy choices, and to decide as intelligently and scientifically on the aggregate supply of money. It is the belief of AMI that to monitor all these questions and more, the Fed needs to become a public institution and become the fourth branch of government.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Let's continue looking at the world's challenges, including economic migration. That foreign banks and American banks offshore create eurodollars goes beyond the scope of this paper but remains an area for research and crucial policy development. Alternative proposals like having an international currency along the lines of carbon credits and revisiting the previous policies of parity and parity tariffs are also being considered. The goal is to make seigniorage and regulate a dollar's value work towards justice and equality. What is parity(?) and the parity tariff? Parity was, and is, a U.S. law that was in effect from 1942 until 1953 and is a period worthy of study. These policies might be reformulated to meet today's challenges as they successfully met the challenges of WWII and its aftermath. Parity works on the notion that we are all interdependent in society and that we need to be paid sufficiently to have a healthy life. The parity tariff is simplified here based on the principle laid out by Carl Wilken in 1947 titled *Prosperity Unlimited - The American Way* (out of print presently). Although this goal is beyond the scope of this survey, a microcosm of this perspective is shared here to give an example of the imagination we need to face today's challenges. The idea is similar to Henry Ford paying his workers well enough so they could afford to buy his cars. High domestic prices are necessary for a higher standard of living, especially for the workers who produce those products. Equivalent imported goods coming into these advanced economies at a lower price have an import tariff tax equalizing the import and domestic price. The money collected goes into a bank account. After some time, each country balances the accounts, with the poorer countries receiving the profits that formerly went to the importers. The poorer countries could then spend that balance of money in the country they exported to during that period and pay for the goods at the domestic price level of that advanced country. By doing this, the domestic price level in the more advanced country is maintained. At the same time, this parity tariff program helps the poorer country bring up their standard of living. Here is a simple example of the above. A California producer of avocados sells in the domestic marketplace an avocado for \$0.75. The grower can pay their bills and make a small profit at that price. I live in Chicago and can buy that domestic avocado from my favorite chain store for \$1.00. The importer for that chain store also buys an equivalent avocado from Mexico for \$0.50 and sells that avocado to me in Chicago for \$1.00. The difference between purchasing the California and Mexican avocado is \$0.25. This money would not be profit for the importer or my favorite chain store or savings to me. Instead, it would be hit with a tariff that protected the domestic price in California. After the accounting back and forth was done over time, the tariff money would assuredly show a balance of imported tariff money coming in from Mexico. Mexico could use this balance to buy U.S. goods at U.S. domestic prices. This parity tariff system would be an economical way to bring the world up to our standard of living and reduce the need for economic migration. A lot that goes on in the name of developmental economics becomes a debt trap for poorer countries. Parity economics and the full employment goal of the Fed would help eliminate suffering here and abroad. The responses to the first two questions give our perspective on how a CBDC should come into existence. The goal is to make money neutral and not favor a private elite group of bank owners and officers, but to make a system work that favors all people equally. If the New Fed is making jobs available on-demand, there will be the money available for people to afford their mortgages with little to no need to have a run on the banks. However, making things work well in this country does not eliminate the pressing problems affecting the whole world. Rather than have a currency that dominates the world with unfair privileges, we need to develop parity tariffs and other par economic ideas to create a supportive and nurturing humanity and not wanton greed and profit. By this time, we should know that the Earth cannot give us compounding interest rates and unlimited growth but hopefully can meet our real needs.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Imagine we had a monetary system where if a person wants to help society, there would be a decent job found for them. There might be less violence and real helpful productivity gains. Is this possible today? If you create money only for actual employment rather than to financially speculate or simply throw money at a problem, the answer is yes. Take the example of Colonial Pennsylvania and the paper monetary system they created there. It says right in the 1723 law that issued the money that this law is "... intended for the benefit of the poor, industrious sort of people of this province, at an easy interest, to relieve them of the present difficulties they labor under...."

(<http://www.palrb.us/statutesatlarge/17001799/1723/0/act/0261.pdf>, p328). It was a paper money system the purpose was to support a medium of exchange for all the productive aspects of the economy. By the late 1720s, young Ben Franklin understood and wrote about the procedure. We credit him for starting the Post Office, Sanitation, Fire Departments, etc. He didn't have the money to do all this, but he knew how the Pennsylvania Assembly could create the money (think Fed and CBDCs) and have it recirculated to put people to work.

Despite the French-Indian War in the 1750s, Colonial Pennsylvania ran the least inflationary monetary system during the colonial period and, by one source (Lester, Richard; Monetary Experiments, 1939, reprinted 1971, p.108) in any 52 years of U.S. history. They focused on work and jobs and not on making certain people privileged rich. If the Pennsylvanian Assembly could do all that with little background in political economy, then the Fed should undoubtedly be able to do it today. Yes, inclusion all the way!

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

We are now aware of climate change, pollution, and the need for humans and life on the planet to harmonize with the Earth itself. This goal should help define where the jobs need to be. The goal is to create money for jobs to meet the pressing needs of society and the planet, not for financial instruments in a secondary market. In a command economy you can create money to employ everyone. Create money in excess of that is inflation. AMI does not want to support a command economy, but does want the people hired who want to help society. Priorities are employment with good benefits and retirement. Simply, if a person wants to work, there is a job available to them. We want this for ourselves, and by extension, our family and neighbors, and outwardly to everyone. The goal for the New Fed is the full availability of jobs without inflation.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Let's consider the difference between commercial banks bringing new credit/money into circulation versus the New Fed bringing new money into circulation. The New Fed can bring money into circulation, not tied to collateral or interest rates. What is the difference? In a debt-based monetary system with profit and growth as the central themes, collateral will tend to replace trust over time. Finding collateral will be the basis for obtaining a loan and wealth creation (Milton Friedman). Michael Milken has spoken about the need to collateralize the commons, i.e., the public sector. He was saying that we are running out of private collateral to maintain growth. In theory, a bank could, over time, own the water rights of Bolivia or own Antarctica. Besides the problem of collateral, there is the problem of interest rates. In a debt-based money system, the loan principal becomes the new money coming into circulation. The interest payments have not been created, and it is paid along with the principal. In stagnant times with few new loans being made, this debt-based money system can still work if the banks, who earn the interest rates, can get that money back out into circulation so the borrowers can earn that money to make the payments on their loans. However, if relatively few people and companies obtain an excessive amount of the money supply, there is less money available for borrowers to earn and make their loan payments. Debt can increase beyond the available income earned to pay off the debt. Human-caused or naturally caused circumstances all too often means that bank loan officers lose confidence in the overall economy cyclically, and debt defaults occur. Here is the monetary reformer and environmentalist's plea to ourselves and the people who lead our monetary system: Interest Rates, Collateral, and 1,000,000 Living Species to Be Lost: Interest rates put the economy on a treadmill in a debt-based monetary system. Everyone in the aggregate has to push to pay the overhanging debt. Together, interest rates and collateral will automatically push humans towards profits and growth over the needs of sustainability, a healthy environment, and in the aggregate, a healthy planet. We are in the midst of losing a million species, one-quarter of the plants, at a rate perhaps only exceeded by giant meteors hitting the Earth in earlier geological times. We live in a system where the earth credits and humans debit. When will we pay back Earth and have a pristine planet again? Our money and banking system today is like the cheerleaders at a sports game, promoting more human debiting. Suppose a newly created CBDC (purposed by Congress) is coming into circulation while the banks are still issuing new money via loans. In that case, the Fed's action may serve as an occasional relief valve to one significant, onerous tendency of our present debt-based monetary system in "side-by-side" money creation. However, the overall challenges will remain in place to undermine our humanity, and perhaps competitively so. Instead of money, profit, and growth leading the way, we need a monetary system that promotes patience, love, caring, curiosity, and understanding so that a pristine Earth can meet our and everyone's actual needs. The time has come, and if not now, when?

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Yes, we can have private, non-profit, or public banking systems that can stand on their own two feet, and if they do well, they can make a living equal to any other sector in the economy. They can provide efficient fee-for-services and investment opportunities. Suppose we have a New Fed and a Congress concerned about jobs for everyone who wants them. Can the Federal government still invest new money into the banking system for mortgages, student loans, and business investments? The New Fed would have to help determine the level of spending and perhaps coach Congress as its investment banker. Maybe instead of direct

student loans, Congress could allocate money based on student attendance at higher and adult education places for jobs at those institutions. Perhaps Congress could give money for new home mortgage loans knowing that money will put people to work. After Alexander the Great died (323BC), one of his generals, Ptolemy, obtained control of greater Egypt. Until the Romans took over in 30 BC, a banking system developed and infused into the government. For example, the government made investments in papyrus paper for writing purposes, which was financially successful. Perhaps the New Fed could support Congress taking an equity position in some adventure and making some profit(?). AMI has no present policy on this, but this writer thought it was an idea worth mentioning (Heichelheim, Fritz M.; *An Ancient Economic History*, Vol. III, 1968, p. 112-125; a marvelous description of this ancient but sophisticated banking system). Stablecoins and local currencies both have merits. Cryptocurrencies are pretty problematic. Questions around seigniorage, energy requirements, and fairness to the broader communities where they operate need to be considered case-by-case. That Silvergate bought the non-profit Diem stablecoin technology makes me curious, and at this time, the answers are not available.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Some financial innovation products such as interest rate swaps and auction-rate bonds can turn the banking world into a casino, and great harm can be done. If the New Fed controlled the money supply with the purpose of funding society's work, these questionable practices could be eliminated. Money Market Mutual Funds came about to meet the practical need to get around the interest rate ceiling in the time of high inflation during the 1970s. If the New Fed can do its job keeping the economy in-between inflation and deflation, the need to go around the existing system can be avoided. People desiring high interest need to secure credit cards or take an equity interest in a start-up company. Suppose banks and financial non-banks are allowed to continue creating the money for society as we have operating today. In that case, the above problems and more will not change. CBDCs will simply come into existence as part of the system that protects relatively a few people maintaining an unfair privilege and its advantages. The Fed needs to work in an enlightened way with all citizens and the legislature to remake itself to meet today's challenges.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

It can be anticipated that cash usage would decline. However, as a medium of exchange, cash would still offer the best privacy and, for many, an essential measure of confidence in the monetary system overall. Next to holding gold and silver is cash for many people worldwide.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

At Chase Bank, Zelle and other products quickly make payments across the country within those networks. In time, with or without CBDC, these products will develop, but much more slowly than the potential of a CBDC internationally connected.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The old saying, "No one likes to change except a wet baby." In the name of efficiency, we move on. What will happen to Western Union and their business? How can they evolve into a new future? The currency exchanges may have other products to keep them going, but they may not wholly survive. The good news is that there will be other good jobs available to help serve society. Being interested, having the ability, and applying oneself will help steer oneself to the desired job, but being open and trying something different but valuable will also benefit society and should be personally rewarding. As far as CBDCs are concerned, one can only imagine that U.S. citizens would not want to be left behind.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

If cash is maintained, and the Fed is ready to look at maintaining full employment seriously, everything else can be made to work out. Because of a pandemic and supply delays, disruptions in the economy can be modeled and forecasted much like we forecast the weather today. In Colonial Pennsylvania, there was £85,000 in circulation before the French-Indian War started in earnest in 1755 after Braddock's Defeat. For approximately five years, that war continued in North America. A dramatic £485,000 was created and put into

circulation "for the King's use" to fight that war. Taxes took away nearly £85,000 leaving £485,782 in circulation by mid-1760. By the early 1760s, there was price inflation, but not the 500+% predicted by the amount of additional money for some reasons. Another factor was that the Pennsylvania Assembly, from 1762 to 1769, taxed out of circulation £25,000, which helped lower prices by 13%. Today, with modeling tools and education, the citizens can learn what is needed to come out of a crisis with inflation. Citizens would know what is happening and could support of their own volition what is required to get to the desired result. This transition to full employment based on worker desire would be a change in mindset. Education would play an important role. Ultimately, the central banks would have to work together with BIS and economists to develop a plan to accommodate the world's population living in harmony on this planet. As a past anthropologist and environmental science teacher, this writer can tell you that there will be no lack of jobs to help maintain harmony with Earth. The good news is that the Earth can be forgiving and patient as we give back the credit that we have debited. Also, some will bring up population control. Instead, I would suggest using the term "population education" and an honest explanation of how the monetary system can support us individually and society overall. People can make good decisions.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

The lack of monetary privacy can bring up a lot of fear. Yes, there should not be illicit financial activities, and today's governing bank money laws can be applied to CBDCs.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

This question goes beyond the policy questions that AMI has considered. Learning from the world of cryptocurrencies and stablecoins such as Diem might be a start.

*14. Should a CBDC be legal tender?*

Yes, it will give citizens more trust and confidence in this form of money.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Naturally, interest might well kick-start the currency and then be dropped later. However, interest should be unnecessary due to natural curiosity and the services that such accounts will be able to offer. Interest should be associated with risk, and there is no risk here.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

No. However, today, there is a problem along these lines in our monetary system. When you have super-wealthy people, they can influence the markets. We might need laws to govern how large amounts of existing money come into the American economy so that the Fed and Congressional policymakers can make adjustments for needed job creation and price stability. For example, suppose a rich person wants to open a plant and hire many workers with decent salaries and benefits. In that case, the Fed and Congressional policymakers might not have to consider creating the money to put these people to work if they need jobs or more work.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

This question brings up fundamental structural issues and the meaning of "intermediaries." The word intermediary in banking and money textbooks starts with a general meaning: "a bank borrows short and lends long." Today, all the way up to the BIS website, you can find "intermediary" used in this most general sense. The AMI uses this term more precisely when a bank or non-bank financial institution uses actual depositors' money and transfers that money to a borrower. The money used in that transfer is not the bank creating credit. It is the depositor(s) investing. Since 1971, when money market mutual funds were created as a move toward financial innovation, the Fed and other central banks have gone on a faster track of losing control over their respective national monetary systems. With cryptocurrencies and the Diem promoting a stablecoin, the Fed and other central banks will continue to lose market share and the corresponding seigniorage privilege. The fundamental question is, to whom does the seigniorage privilege belong? In the United States, the seigniorage privilege belonged to Colonial Pennsylvania with its alternative paper money system. During the American Revolution, the "Continental," despite England successfully counterfeiting it, the seigniorage was gained by the Continental Congress. During the American Civil War and after, the Greenbacks were the seigniorage privilege of the Union government. History shows that if the bankers control the seigniorage privilege, then over time, they will control the

financial system and then the government. If there is equality, where money is neutral, then the seigniorage privilege belongs to the people or its representative government. It certainly does not belong to a private class of citizens called the bank owners and their officers and lobbyists doing their bidding. Is the Fed important? Yes, it is, and it's so essential that there should be a New Fed, and it should be the fourth branch of government, crucial in its realm, and equal in status to the other branches. How can seigniorage equality be achieved? The answer is in many different ways. The Treasury could obtain the full seigniorage privilege, or all the nation's people could gain the seigniorage privilege by having all new money go equally into their Fed Accounts. An intermediate possibility is for cities and states to set up public banks and be allowed the seigniorage privilege of issuing money for work. Or, differently, the cities and states could simply obtain the necessary financial distribution to do their hiring or procurement, or lending. To avoid inflation means you do not allocate money to solve a problem by throwing money at a problem; you create the financial resources when you have the people and the resources to solve the given problem or achieve an opportunity.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes. One idea is that a person could go to their post office or participating financial center working with CBDCs. They could simply swap CBDCs for cash and use it offline.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes, but maybe there should be limits, especially at first, as we go through a learning curve.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

You are working on those capabilities now. Good luck, and we support all the technical success that is possible and feasible.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

One day we might want to separate banking and lending as two separate practices. The first would be a fee for services. The second would be a worldwide peer-to-peer lending platform(s). If you invested a \$1,000, you might have 1/10 of a penny in a million homes - a genuinely diverse and hopefully a stable investment.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

It is certainly a different day. We have population and demographic challenges. We have pollution, climate, and pandemic problems. We have resource problems. We have the problem of a lack of collateral and trust in our present financial system. However, if you are ready to tap into the love people have, you will find that while the Earth itself and the Fed may not meet all the wants and greed, but will be able to work out a plan that amply meets the needs of the people. It will be a society led more by curiosity than the need to win and have more and more. In one way, we are democratizing money with CBDCs. However, in another, we, as a society, are ignorant and have lost our way in how a monetary system works. Slowly and continuously, the Fed, as part of the banking system itself, has protected a plutocracy of its kind that, in the words of my senator, Dick Durbin, "owns this town" - referring to Washington, D.C. I don't think that was the intent of Congress when they passed The Federal Reserve Act. The Dodd-Frank law did make regulatory changes to prevent another Great Recession. But, within a few years of its passing, the bankers' lobby had that law dismantled, and we are at the place as we were prior to that law. Today, we are entering a whole new territory of possibilities while, at the same time, we are patching this monetary system to keep it functioning through today's challenges. However, the inherent structure is driving humanity off a cliff. Citizens look at their circumstances and don't understand them, and many follow untruths and conspiracy thinking. In part, we have a fragile democracy and further potential for political upheavals. This situation reminds me of early ancient Greece, where the citizens would turn to a tyrant and hope for the best. The way out of this is honesty and education and acknowledging we need to work toward democracies on all levels and not a plutocracy. We have to make money neutral again and not give some people an unfair advantage that recent history has shown that they will use to privilege themselves at the expense of others. The Fed reminds me of the wizard behind the curtain in the Wizard of Oz. The Fed needs to come out from behind the curtain, be with all the people, and work for all the people. Thank You for this opportunity!

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*Industry*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

While what the document stated is correct, technology is available that will expand these functions. Additional benefits from a properly formed CBDC (supported by accredited standards) would support the objectives of faster payments and promulgation of ISO 20022 thru the use of: A new payment system, when implemented correctly, requiring strong authentication and strong enrollment procedures for all participants, would eliminate a significant amount of the crime. In support of these objectives, technology reform must also be considered to mitigate the new risks that are surfacing. One sector of technology that can help this necessary objective is associated with an agile cryptography framework. It would provide self-protecting data objects that are independent of the network choices and indifferent to storage, based on dynamic key management. This mitigates the problems of quantum rather than the static processes used today that are associated with the quantum computing environ which is nearly upon us. The advent of agile cryptography can offer a new technical enhancement that supports the network of networks necessary for the CBDC to flourish. This technical enhancement, agile cryptography, is available and codified in ANSI standards.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Under a Hybrid CBDC model, the U.S. Treasury would be the issuer, the Federal Reserve would distribute it to U.S. Depository Financial Institutions, and Depository Financial Institutions would hold the deposits on their balance sheet and distribute the Hybrid CBDC to customers. We believe that a Hybrid CBDC would displace most of this value, as a bank-centric Hybrid CBDC with superior privacy, security and regulatory protections and the backing of the U.S. Treasury and Federal Reserve would be a superior product offering to all the existing crypto currencies

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

A new CBDC payment system based on a Hybrid CBDC could be revolutionary and very positive for Depository Financial Institutions and for society at large. For example, the following Use Cases would generate very favorable outcomes for society at large and create over \$593.4 billion in value: Adoption Opportunity Value Identity Assurance Federation (e.g., NACHA's Phixius) \$1.55 billion Bank Owned Credit Bureau \$35.2 billion First Class Email \$516.2 billion U.S. Dollar Hybrid CBDC Stablecoin Issued Via Depository FIs \$10.4 billion Micropayments to Fund the Sale of News Articles \$25 billion + QR Code Network to Trigger Real-Time Payments at Retail Merchants \$1 billion + Replacement for SWIFT \$1 billion + Health Information Exchange \$1 billion + Single Window for Cross Border Trade Facilitation & Supply Chain Billing \$1 billion + Unbanked Financial Inclusion Facilitation \$1 billion + Total \$593.4 billion + The value of the use cases for a Hybrid CBDC is further validated by the market capitalization of the universe of cryptocurrencies, which as of April 6, 2022 was \$2.01 trillion dollars. We believe that a Hybrid CBDC would displace most of this value, as a bank-centric Hybrid CBDC with superior privacy, security and regulatory protections and the backing of the U.S. Treasury and Federal Reserve would be a superior product offering to all the existing cryptocurrencies. Hybrid CBDC has many use cases where it could be used as an electronic form of currency, reducing paper cash, coin, and paper checks in circulation. A

Hybrid CBDC is analogous to a digital form of check processing. Though check volume is decreasing, it may never fully be able to be phased out due to consumer dependencies and habits without legal regulation similar to PSD2. A reduction in check volume and processing brought about by a Hybrid CBDC may be beneficial to the industry and lower overall operational costs. Hybrid CBDC could provide benefit to the un-banked and under-banked population and help increase financial literacy in the population at large

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

If a Hybrid CBDC is implemented the way we recommend, there would be no impact on the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Ideally, the Hybrid CBDC could be a new layer of a database that can be Distributed Ledger Technology or blockchain based. It would hold the ISO 20022, (designed to offer structure, reduce exceptions, and if done securely, reduce cost) compliant transaction and remittance records that serves as the source of truth for each transaction and maintain the persistent protections necessary to maintain customer trust. This document would be native to a new technology overlay layer that would be XML enabled and leverage the Network of Networks approach (e.g., ATM Networks), that could provide a solution set using the building blocks to solve these issues in electronic payments fraud. The four key common core components are: a. An Enrollment and Authentication Identity Assurance Service; b. Cloud Based Big Data & DLT Database where the data is protected leveraging envelope security to provide fine grain control of access and use of the data. Such a system would enable the creation of a zone of privacy for individuals and corporate data which is not possible today with existing payment systems; c. Network of Networks approach to keep costs low in providing interoperability with existing legacy systems; d. Real-Time Payments functionality including Settlement utilizing a Dollar Stable Hybrid CBDC Coin. There is a strong network effect that means that cooperation among banking industry players and the Treasury and Fed would create more value rather than each bank issuing their own;

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

If it is only a store of value not connected to payment services, and if the CBDC deposits are not held by Depository Financial Institutions, it would be directly competitive to bank deposits and because Depository Financial Institutions in a fractional banking system are dependent upon deposits to make loans, it would reduce the funds available for lending by Depository Financial Institutions, damaging the economy. The Clearing House has built a real-time payment system, RTP, the Fed is building a real-time payment system, FedNow, and the Card Networks have real-time payment systems. Unless a CBDC payment system provides functionality beyond the capabilities of these real-time payment systems, a clear business case in favor of building one cannot be made and transactions in CBDC and other cryptocurrencies might occur through existing payment systems. The reserve currency status of the U.S. Dollar, which is based on laws, contracts and trust, could ultimately be at risk if a U.S. CBDC is not developed, as other countries that have those attributes are working on developing CBDCs, and payment systems that would facilitate their wide use in commerce. The problems with the existing payment systems are: a. There is an entire fraud ecosystem around existing payment systems. i. The Fed statistics indicate that annually more than \$11 billion of electronic payments fraud occurs. ii. The current system allows anyone to open a bank account using only Personally Identifiable Information (PII), yet the PII can be purchased for pennies per person on the dark web. The Identity Theft Criminal Ecosystem enables identity theft. Identity theft today is the most expensive crime in the United States, more than double the cost of property theft, which is the second most expensive crime. iii. As to what kinds of fraud exist, the Fed has created an excellent document that creates an ontology of electronic payments fraud types . b. The issue is that we don't have strong identity management to know who our customers are at enrollment or when transacting. Therefore, we do not have certainty as to who is receiving money, initiating a request for money or paying money. And this problem increases as we try to move faster, reducing the time for analysis, control and assured transaction settlement. In a Pure CBDC payment system, the deposits are held on the balance sheet of the Fed and not at Depository Financial Institutions. The banking industry does not support building a Pure CBDC based on the Fed's Project Hamilton infrastructure because those deposits would be held on the balance sheet of the Fed and that would divert substantial deposits from the existing banking system, perhaps fatally undermining the economics of the existing fractional banking system. A Pure CBDC is

essentially analogous to a digital form of paper money (reference the self protecting data objects). Depository Financial Institutions view currency as a pure cost. Currency is costly to handle, costly to store and costly to hold. Depository Financial Institutions try to minimize holding currency as much as possible for these reasons, and because it has a negative impact on bank capital. The negative impact on bank capital will lower the availability of loans in the economy from the fractional banking system.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Ideally, the Hybrid CBDC could be a new layer of a database that can be Distributed Ledger Technology or blockchain based. It would hold the ISO 20022, (designed to offer structure, reduce exceptions, and if done securely, reduce cost) compliant transaction and remittance records that serves as the source of truth for each transaction and maintain the persistent protections necessary to maintain customer trust. This document would be native to a new technology overlay layer that would be XML enabled and leverage the Network of Networks approach (e.g., ATM Networks), that could provide a solution set using the building blocks to solve these issues in electronic payments fraud. The four key common core components are: a. An Enrollment and Authentication Identity Assurance Service; b. Cloud Based Big Data & DLT Database where the data is protected leveraging envelope security to provide fine grain control of access and use of the data. Such a system would enable the creation of a zone of privacy for individuals and corporate data which is not possible today with existing payment systems; c. Network of Networks approach to keep costs low in providing interoperability with existing legacy systems; d. Real-Time Payments functionality including Settlement utilizing a Dollar Stable Hybrid CBDC Coin. There is a strong network effect that means that cooperation among banking industry players and the Treasury and Fed would create more value rather than each bank issuing their own; Such a network layer would also ingest and export data to and from the legacy payment systems. An Agile cryptography framework would provide self-protecting data objects that are independent of the network choices and indifferent to storage, based on dynamic key management. This mitigates the problems of quantum rather than the static processes used today that are associated with the quantum computing environ which is nearly upon us. The advent of agile cryptography can offer a new technical enhancement that supports the network of networks necessary for the CBDC to flourish. This technical enhancement, agile cryptography, is available and codified in ANSI standards

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes. Hybrid CBDC could provide benefit to the un-banked and under-banked population and help increase financial literacy in the population at large

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Unless a CBDC payment system provides functionality beyond the capabilities of these real-time payment systems, a clear business case in favor of building one cannot be made and transactions in CBDC and other cryptocurrencies might occur through existing payment systems. The reserve currency status of the U.S. Dollar, which is based on laws, contracts and trust, could ultimately be at risk if a U.S. CBDC is not developed, as other countries that have those attributes are working on developing CBDCs, and payment systems that would facilitate their wide use in commerce

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The reserve currency status of the U.S. Dollar, which is based on laws, contracts and trust, could ultimately be at risk if a U.S. CBDC is not developed, as other countries that have those attributes are working on developing CBDCs, and payment systems that would facilitate their wide use in commerce

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Ideally, the Hybrid CBDC could be a new layer of a database that can be Distributed Ledger Technology or blockchain based. It would hold the ISO 20022, (designed to offer structure, reduce exceptions, and if done securely, reduce cost) compliant transaction and remittance records that serves as the source of truth for each transaction and maintain the persistent protections necessary to maintain customer trust. This document would be native to a new

technology overlay layer that would be XML enabled and leverage the Network of Networks approach (e.g., ATM Networks), that could provide a solution set using the building blocks to solve these issues in electronic payments fraud. The four key common core components are: a. An Enrollment and Authentication Identity Assurance Service; b. Cloud Based Big Data & DLT Database where the data is protected leveraging envelope security to provide fine grain control of access and use of the data. Such a system would enable the creation of a zone of privacy for individuals and corporate data which is not possible today with existing payment systems; c. Network of Networks approach to keep costs low in providing interoperability with existing legacy systems; d. Real-Time Payments functionality including Settlement utilizing a Dollar Stable Hybrid CBDC Coin. There is a strong network effect that means that cooperation among banking industry players and the Treasury and Fed would create more value rather than each bank issuing their own; Such a network layer would also ingest and export data to and from the legacy payment systems.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Cloud Based Big Data & DLT Database where the data is protected leveraging envelope security to provide fine grain control of access and use of the data. Such a system would enable the creation of a zone of privacy for individuals and corporate data which is not possible today with existing payment systems;

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

The only points of integration between the Network of Networks layer and the legacy payment systems would be via an “edge server” that holds XML tagged data securely exported or imported from a Depository Institution’s legacy payment systems or from the Network of Networks layer. The integration required is equivalent to a banking corporate treasury workstation. The integration is modest, should only take weeks and have a modest cost. By design and purposefully the amount of IT integration with the systems of legacy Depository Institutions is kept to a minimal level. Since most corporate treasury workstation solutions support data exporting and data importing, the challenge is mostly reduced to mapping and by using state of the art mapping automation tools, which have low six figure costs, the technical challenge is low and the technical risk is low. The only point at which there is a point of integration in the payment lifecycle is when good funds are to be loaded into a deposit account hosted at the Network of Networks layer or taken out of the Network of Networks layer and sent back to the legacy deposit system of a Depository Financial Institutions, and Depository Financial Institutions would hold the deposits on their balance. This is as simple as a credit or debit message using the corporate treasury workstation between the traditional Depository Institution and the Network of Networks layer. Adding the latest in security functionalities to the Hybrid CBDC would ensure a security profile that would include necessary security criteria. All the other functions occur within the new Network of Networks layer. Our current electronic payment systems allow lightly authenticated individuals to participate in electronic payment systems and initial payment requests and receive funds. Well established best practices with respect to security are not being adhered to. The Fed’s Secure Payments Task Force created a list of the best practices that should be adhered to, to make the bank payments system secure however many of these items have never been implemented. Those security criteria are: S.1 Risk management S.2 Payer Authorization S.3 Payment Finality S.4 Settlement approach S.5 Handling disputed payments S.6 Fraud information sharing S.7 Security controls S.8 Resiliency S.9 Persistent End-User Data protection S.10 End-User/Provider Authentication S.11 Participation requirements Authorization a. Depository Financial Institutions do this in the name of “good customer service”, as we don’t want to burden our good customers by requiring them to jump through hoops, as we are afraid that if we do, the customers will go across the street to another bank that doesn’t require them to do it. If these rules are baked into a new Hybrid CBDC payment system as a minimum requirement, this problem can be solved. If we build a new payment system, we could choose to do it right and require strong authentication and strong enrollment procedures for all participants. If we do that, we can eliminate a significant amount of the crime. b. In support of these objectives, technology reform must also be considered to mitigate the new risks that are surfacing. One sector of technology that can help this necessary objective is associated with an agile cryptography framework. It would provide self-protecting data objects that are independent of the network choices and indifferent to storage, based on dynamic key management. This mitigates the problems of quantum rather than the static processes used today that are associated with the quantum computing environ which is nearly upon us. The advent of agile cryptography can offer a new technical enhancement that supports the network of networks necessary for the CBDC to flourish. This technical enhancement, agile cryptography, is available and codified in ANSI standards.

*14. Should a CBDC be legal tender?*

Yes, but only if properly implemented to avoid competing with banking institutions and adversely effecting value of US Dollar. In a Pure CBDC payment system, the deposits are held on the balance sheet of the Fed and not at Depository Financial Institutions. The banking industry does not support building a Pure CBDC based on the Fed's Project Hamilton infrastructure because those deposits would be held on the balance sheet of the Fed and that would divert substantial deposits from the existing banking system, perhaps fatally undermining the economics of the existing fractional banking system. A Pure CBDC is essentially analogous to a digital form of paper money (reference the self protecting data objects mentioned above). Depository Financial Institutions view currency as a pure cost. Currency is costly to handle, costly to store and costly to hold. Depository Financial Institutions try to minimize holding currency as much as possible for these reasons, and because it has a negative impact on bank capital. The negative impact on bank capital will lower the availability of loans in the economy from the fractional banking system. A Hybrid CBDC could effectively address all of the concerns that we have raised above. Under a Hybrid CBDC model, the U.S. Treasury would be the issuer, the Federal Reserve would distribute it to U.S. Depository Financial Institutions, and Depository Financial Institutions would hold the deposits on their balance sheet and distribute the Hybrid CBDC to customers.

We don't believe that non-banks or non-bank depositories should have a role in directly providing Hybrid CBDC services; however, third-party processors may have a role in support of Depository Financial Institutions, provided that the proper risk controls are in place. Banks may choose to engage vendors to provide some or all of the functionality of a Hybrid CBDC, analogous to how processors are often engaged by Depository Financial Institutions now to provide some or all of legacy payment system functionality. The use of third-party processors for Hybrid CBDC can allow smaller Depository Financial Institutions without the needed technology to participate, similar to how Depository Financial Institutions use third-party processors to provide ACH services to their customers today.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

If CBDC is legal tender, then it should pay interest; following the current standards

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

No. This is legal tender.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

A Hybrid CBDC could effectively address all of the concerns that we have raised above. Under a Hybrid CBDC model, the U.S. Treasury would be the issuer, the Federal Reserve would distribute it to U.S. Depository Financial Institutions, and Depository Financial Institutions would hold the deposits on their balance sheet and distribute the Hybrid CBDC to customers. We don't believe that non-banks or non-bank depositories should have a role in directly providing Hybrid CBDC services; however, third-party processors may have a role in support of Depository Financial Institutions, provided that the proper risk controls are in place. Banks may choose to engage vendors to provide some or all of the functionality of a Hybrid CBDC, analogous to how processors are often engaged by Depository Financial Institutions now to provide some or all of legacy payment system functionality. The use of third-party processors for Hybrid CBDC can allow smaller Depository Financial Institutions without the needed technology to participate, similar to how Depository Financial Institutions use third-party processors to provide ACH services to their customers today

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

A digital event is an on-line event.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Ideally, the Hybrid CBDC could be a new layer of a database that can be Distributed Ledger Technology or blockchain based. It would hold the ISO 20022, (designed to offer structure, reduce exceptions, and if done securely, reduce cost) compliant transaction and remittance records that serves as the source of truth for each transaction and maintain the persistent protections necessary to maintain customer trust. This document would be native to a new technology overlay layer that would be XML enabled and leverage the Network of Networks approach (e.g., ATM Networks), that could provide a solution set using the building blocks to

solve these issues in electronic payments fraud. The four key common core components are: a. An Enrollment and Authentication Identity Assurance Service; b. Cloud Based Big Data & DLT Database where the data is protected leveraging envelope security to provide fine grain control of access and use of the data. Such a system would enable the creation of a zone of privacy for individuals and corporate data which is not possible today with existing payment systems; c. Network of Networks approach to keep costs low in providing interoperability with existing legacy systems; d. Real-Time Payments functionality including Settlement utilizing a Dollar Stable Hybrid CBDC Coin. There is a strong network effect that means that cooperation among banking industry players and the Treasury and Fed would create more value rather than each bank issuing their own; Such a network layer would also ingest and export data to and from the legacy payment systems.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

The only points of integration between the Network of Networks layer and the legacy payment systems would be via an “edge server” that holds XML tagged data securely exported or imported from a Depository Institution’s legacy payment systems or from the Network of Networks layer. The integration required is equivalent to a banking corporate treasury workstation. The integration is modest, should only take weeks and have a modest cost. By design and purposefully the amount of IT integration with the systems of legacy Depository Institutions is kept to a minimal level. Since most corporate treasury workstation solutions support data exporting and data importing, the challenge is mostly reduced to mapping and by using state of the art mapping automation tools, which have low six figure costs, the technical challenge is low and the technical risk is low. The only point at which there is a point of integration in the payment lifecycle is when good funds are to be loaded into a deposit account hosted at the Network of Networks layer or taken out of the Network of Networks layer and sent back to the legacy deposit system of a Depository Financial Institutions, and Depository Financial Institutions would hold the deposits on their balance. This is as simple as a credit or debit message using the corporate treasury workstation between the traditional Depository Institution and the Network of Networks layer. Adding the latest in security functionalities to the Hybrid CBDC would ensure a security profile that would include necessary security criteria. All the other functions occur within the new Network of Networks layer.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

A new payment system, when implemented correctly, requiring strong authentication and strong enrollment procedures for all participants, would eliminate a significant amount of the crime. In support of these objectives, technology reform must also be considered to mitigate the new risks that are surfacing. One sector of technology that can help this necessary objective is associated with an agile cryptography framework. It would provide self-protecting data objects that are independent of the network choices and indifferent to storage, based on dynamic key management. This mitigates the problems of quantum rather than the static processes used today that are associated with the quantum computing environ which is nearly upon us. The advent of agile cryptography can offer a new technical enhancement that supports the network of networks necessary for the CBDC to flourish. This technical enhancement, agile cryptography, is available and codified in ANSI standards. Ideally, the Hybrid CBDC could be a new layer of a database that can be Distributed Ledger Technology or blockchain based. It would hold the ISO 20022, (designed to offer structure, reduce exceptions, and if done securely, reduce cost) compliant transaction and remittance records that serves as the source of truth for each transaction and maintain the persistent protections necessary to maintain customer trust. This document would be native to a new technology overlay layer that would be XML enabled and leverage the Network of Networks approach (e.g., ATM Networks), that could provide a solution set using the building blocks to solve these issues in electronic payments fraud. The four key common core components are: a. An Enrollment and Authentication Identity Assurance Service; b. Cloud Based Big Data & DLT Database where the data is protected leveraging envelope security to provide fine grain control of access and use of the data. Such a system would enable the creation of a zone of privacy for individuals and corporate data which is not possible today with existing payment systems; c. Network of Networks approach to keep costs low in providing interoperability with existing legacy systems; d. Real-Time Payments functionality including Settlement utilizing a Dollar Stable Hybrid CBDC Coin. There is a strong network effect that means that cooperation among banking industry players and the Treasury and Fed would create more value rather than each bank issuing their own; Such a network layer would also ingest and export data to and from the legacy payment systems.

*22. Are there additional design principles that should be considered? Are there tradeoffs*

*around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

The points of integration between the Network of Networks layer (modular in design) and the legacy payment systems would be via an “edge server” that holds XML tagged data securely exported or imported from a Depository Institution’s legacy payment systems or from the Network of Networks layer (based on published standards). The integration required is equivalent to a banking corporate treasury workstation. The integration is modest, should only take weeks and have a modest cost. By design and purposefully the amount of IT integration with the systems of legacy Depository Institutions is kept to a minimal level. Since most corporate treasury workstation solutions support data exporting and data importing, the challenge is mostly reduced to mapping and by using state of the art mapping automation tools, which have low six figure costs, the technical challenge is low and the technical risk is low. The only point at which there is a point of integration in the payment lifecycle is when good funds are to be loaded into a deposit account hosted at the Network of Networks layer or taken out of the Network of Networks layer and sent back to the legacy deposit system of a Depository Financial Institutions, and Depository Financial Institutions would hold the deposits on their balance. This is as simple as a credit or debit message using the corporate treasury workstation between the traditional Depository Institution and the Network of Networks layer. Adding the latest in security functionalities to the Hybrid CBDC would ensure a security profile that would include necessary existing standards based security criteria. All the other functions occur within the new Network of Networks layer. Concluding Comments In conclusion, we recommend that the Fed evaluate with respect to a Hybrid CBDC the following: A. The cost of building a Hybrid CBDC and the business & revenue case for it; B. The cost and potential revenue benefits to Depository Financial Institutions of providing Hybrid CBDC services; C. A plan prioritizing the roll-out of Hybrid CBDC backed use cases and their timing, which analysis should also take into account the enhanced information security requirements, as well as the priorities and needs of the U.S. population including barriers to adoption and mechanisms for breaking down those barriers. D. Assisting industry to create a minimum baseline of security and operational controls for handling Hybrid CBDC that would then be turned into an FFIEC regulatory requirement for all Depository Financial Institutions providing Hybrid CBDC services.

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*Name or Organization*

Chamber of Digital Commerce

*Industry*

Trade Organization

*Country*

United States of America

*State*

District of Columbia

*Email*

marian@digitalchamber.org

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Additional benefits, considerations and risks include: a. Consideration: Global interoperability amongst other CBDCs (as well as digital assets writ large) is critical. We anticipate a future in which almost anything of value could be tokenized (securities, art, commodities, etc.). Ensuring CBDC's can flexibly interoperate with other digital assets is also important. We support the open-source approach proposed on 3 February, 2022 by the Boston Fed and Digital Currency Initiative at M.I.T. b. Consideration: We recommend that the Fed consult with the BIS, other central banks such as Bank of England, Monetary Authority of Singapore, and Bank of Canada (who along w/ Boston Fed are working with MIT) to identify benefits and risks related to global CBDC interoperability. We also recommend the Fed identify potential fintech partners that can provide knowledge and technology solutions for interoperability. c. Risk: We believe the paper emphasizes Know Your Customer ("KYC") and Anti-Money Laundering ("AML") compliance at the expense of consumer privacy. As federal lawmakers continue to debate a national privacy law that covers all types of data, the US should ensure that a US CBDC emulates cash and prevents against tracking individuals' purchasing behavior.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

In the eyes of many, the US already uses digital money. We make retail transfers and payments through Venmo and PayPal. On the wholesale side, we have digital RTGS systems, ACH, and soon, FedNow. The U.S. also utilizes digital money transfer systems like Western Union and MoneyGram that use SWIFT + CHIPS, etc. Why can't we simply continue doing what we're currently doing and just make it better? The answer is that the existing payments infrastructure is antiquated. It's hard to do atomic settlements over networks that process in T +2/3. Furthermore, these systems employ layers of middlemen, correspondent banking, or other intermediaries, which are costly and inefficient. One of the obvious differences between a CBDC and current digital money is programmability: the ability to insert a smart contract in the currency. This is impossible to do through existing payments infrastructure.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

A CBDC could favorably affect financial inclusion. According to a FDIC 2019 survey, approximately 7.1 million US households remained unbanked, and access to a digital wallet could improve access to financial services. Some have suggested that the government could provide a free government wallet to the unbanked. Remittances account for ~ 25-30% of Honduras, Guatemala, and El Salvador's GDP. According to the World Bank, remittance fees run between 5-10% which disproportionately affects minority communities in the US. A properly functioning CBDC could settle atomically and – if interoperable with other CBDCs – could significantly reduce these intermediary fees. Education must be a key component of any CBDC rollout. Individuals that do not know how to use CBDCs or digital wallets could fall behind and this may result in even greater economic wealth polarization.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Smart contracts embedded in CBDCs could improve the Fed's efficiency in implementing monetary policy, for example, by speeding up or slowing down the economy by attaching a coupon to the CBDC. Macroeconomists at the Fed could consider adding new features to programmable money. For example, the Fed could issue a special class of CBDC with an "expiration date" that induces individuals to spend money quickly and grow the economy. Or the Fed could create yet another class of CBDC that can't be used until the wallet holder turns a certain age, thus providing a financial safety net. All of these interesting and potentially positive features should be considered with personal freedom, privacy and government overreach in mind. Additionally, the Fed will need to consider from a policy perspective if a CBDC with an interest rate is M0 money. Is it a money market account? Is it a bond?

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

It's unclear how a CBDC could affect financial stability given that a CBDC is still hypothetical. Yet, we urge you to consider how a CBDC could affect the commercial banking industry, debt and equity capital markets, global commodity trading, etc. For instance, how what impact would interest-bearing CBDCs have on the business of deposit-taking institutions such as commercial banks? It is vital to research this before implementation of a CBDC, as the substitution of commercial deposits could reduce credit availability for businesses and individuals.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

There are many ways a CBDC could adversely affect the financial sector. For example, if privacy protections are not put in place or if speed/latency isn't fast enough or scalable, potential CBDC users will stick to cash. Additionally, if cyber security isn't adequate and sufficient and the CBDC gets hacked, it will undermine consumer confidence in the CBDC, as well as undermining the financial system itself. There is a potential that if a CBDC is done well, there will be limited need for digital M1 non-bank money like Venmo and Paypal.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

From a policy perspective, the Fed should be focused on opening up to innovation and competition and eliminating existing silos, rather than protecting the current banking system. There is a potential for a hybrid model of a CBDC in a transition period, whereby banks could limit the amount of CBDC they take on balance sheet. A proper sandbox environment will also be critical for testing the CBDC with the financial sector prior to any broad implementation, in order to assess the real-world impacts of a CBDC. The Fed should also evaluate the potential of a wholesale CBDC, which could have less negative impact on the current financial sector than a retail CBDC.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Cash usage has already declined 20% and has been replaced by non-bank digital money (Venmo, Zelle, Paypal, etc). Given that non-bank digital money is M1 while a CBDC is M0, a CBDC should be designed as a digital bearer instrument. Thus, thinking through the chain of custody is crucial. A CBDC should have some of the characteristics that people like about cash, including privacy. Finally, a CBDC should be designed with an off-line solution in mind.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

A logical place for cross-border and digital payments to evolve is China - The most obvious threat to the US dollar is the Chinese RMB and its digital equivalent, the e-CNY. Beijing has made it clear that its medium-term plan is to promote a multipolar currency world. Ultimately, China's goal is for the RMB to be the global reserve currency. It is imperative for the US to evolve to avoid losing global reserve currency status. Other observations - Costs for cross-border digital payments are falling and will continue to do so. Commercial banks are already working on advancing the speed and cost for FX services. Meanwhile, cyber, operational and technology risk will continue to rise, and this needs to be addressed as the international payments system evolves. Research and scenario analysis is necessary to understand this picture more clearly.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Other large economy nations have already made decisions to issue CBDCs. China is the first large country to do so. The European Central Bank will likely be second. Rather than focus on what other nations are doing, we should consider that any US CBDC should reflect American values. The Boston Fed has done outstanding work with Project Hamilton. Along with MIT, they created core open-source technology for CBDCs, and we expect that the ecosystem of developers, policymakers and other stakeholders will continue to improve upon it. We commend the open-source approach and hope it becomes a de-facto industry standard. If another country (like China) develops a rival CBDC standard and exports it to the many countries where it exerts influence, it could undermine US national security. Agreement upon an interoperable network is critical to reducing systemic risk. International coordination among the countries dedicated to responsibly adopting a CBDC is imperative. To assure interoperability, a global network of like-minded countries should work to establish agreed upon and adopted principles, protocols, and technology reviews. Research and analysis should be led and coordinated by the US government, regulatory agencies, and the Fed to ensure US dollar reserve status.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Persistent research and analysis is always helpful to identify risks that are not yet known or fully understood. Creating a matrix of known risks would be a good place to start adding new risks as insights are gained. Considerations of quantum computing need to be addressed in addition to AML and KYC compliance issues. Furthermore, monetary policy such as managing inflation were not raised in the paper. Ongoing technological advancements and innovations should be constant considerations.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Critically, we need to ensure that a CBDC does not facilitate illicit activity. The Bank Secrecy Act currently requires that commercial banks take steps to guard against money laundering. Policymakers will need to consider whether a similar anti-money-laundering regime would be feasible for a Federal Reserve CBDC, but it may be challenging to design a CBDC that respects individuals' privacy while appropriately minimizing the risk of money laundering. At one extreme, we could design a CBDC that would require CBDC holders to provide the Federal Reserve detailed information about themselves and their transactions; this approach would minimize money-laundering risks but would raise significant privacy concerns. At the other extreme, we could design a CBDC that would allow parties to transact on a fully anonymized basis; this approach would address privacy concerns but would raise significant money-laundering risks. Today, commercial banks largely handle retail KYC/AML concerns. When one goes to an ATM, the bank (a) presumably knows who you are, (b) records that you withdrew cash, and (c) limits the amount of cash you could withdraw. Once cash is withdrawn, however, it becomes fully anonymous. A CBDC could function similarly. Rather than withdraw physical cash from an ATM, one would draw CBDC digital cash from the commercial bank app. Similar to the ATM example, the commercial bank would perform all KYC/AML functions. Once transferred, a user could then choose to "self-custody" the CBDC digital cash in a personal wallet and spend it anonymously. An international identity protocol to allow access with defined rules protecting privacy could also be considered. We recommend implementing a permissioned-level of transparency (i.e. only for those allowed, for example - Espresso Systems out of Harvard) and consideration for account-based versus token-based privacy. To avoid the Chinese version of a CBDC, the issue of privacy needs to be further studied. According to a speech given by Governor Brainard: "The design of any CBDC would need to both safeguard the privacy of households' payments transactions and prevent and trace illicit activity to maintain the integrity of the financial system, which will require the digital verification of identities. There are a variety of approaches to safeguarding the privacy of payments transactions while also identifying and preventing illicit activity and verifying digital identities. Addressing these critical objectives will require working across government agencies to assign roles and responsibilities for preventing illicit transactions and clearly establishing how consumer financial data would be protected."

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

If a CBDC pays interest, we must define it. Is it a bond? A money market account? If a CBDC looks like a bond, or a savings account, or a money market account, who regulates it? Will an interest-bearing CBDC be more attractive than deposit-taking institutions like commercial banks? This is particularly important because the risk of commercial bank money substitution is highest for an interest-bearing CBDC. This substitution could reduce credit availability for businesses and individuals.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

No, we believe that digital money should be treated equally with cash and cash-equivalents. There must be parity and restrictions would unnecessarily burden CBDC holders.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Banks, fintech firms, custodial wallet providers, and others would be likely intermediaries to provide KYC and AML functions. These entities should be regulated (licensed) at the federal level versus state and be subject to current money transmitter laws.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes. One practical solution would be to use NFC (near-field communication) chip technology. A physical CBDC "card" could connect to the phone app, etc. Nevertheless, the issue of double spend is extremely difficult to solve in an off-line situation. Additionally, if a US CBDC employs blockchain technology, there are certain issues to consider. We draw the distinction between "offline" and "offchain." Off-chain transactions enable quicker transactions, lower fees, and greater privacy protections. Off-chain transactions can handle more volume and therefore make it easier to scale networks. This is a very different issue than offline (like if the power goes out due to a natural disaster, etc).

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes. The easier you make it for people to pay, the more acceptance there will be. Prominently displayed QR codes in retail environments plus users' ability to pay through wallets that are interoperable will make this easy.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Interoperability and privacy are key. An ideal standard would be US-based versus international. We recommend utilizing components of the EU's GDPR privacy standards, specifically their compliant data migration policies, as a template. US would be ANSI X9. There is technology that exists to allow this.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

a. Quantum computing a consideration. b. IOT is another consideration c. The evolution of De-Fi, digital assets, and NFTs are a consideration

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Design principles should include fully open-sourced technology. Inclusion remains an issue – how will those without smartphones participate in the economy? Compliance, privacy, and security must all be factored into the design.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

A CBDC will affect financial inclusion. The unbanked and underbanked will have better access to digital financial services and faster payment systems at a lower cost. However, barriers that have excluded those from utilizing traditional financial systems would need to be removed. These barriers include Identification and address requirements; the cost of services; and a distrust of financial institutions. Changing the behavior of the underbanked/unbanked will be key to the acceptance and usage of CBDC. If these barriers can be removed, CBDC can have a net positive impact on financial inclusion.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

A CBDC could have an adverse effect on the financial sector. Specially, there could be an erosion of deposits on an individual bank's balance sheet because a CBDC would be reflected on the Fed's balance sheet instead. As a result, banks may have increased funding needs if traditional deposits are scarce. Increased funding needs would then correlate to higher expense/cost of funds. Perhaps the Fed could track the bank from which the funds to purchase a CBDC originated to help quantify the impact on individual banks.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes since there are some concerning factors with the CBDC such as privacy concerns, risk of Fed increasing money supply overnight, track and trace people in real time and the ability to "turn off" one's dollar.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Future payments will need to be handled in a non-traditional way meaning no handheld cash. Crypto Wallet, Visa/ Master card conversion to be able to handle dual style accounts. Convert or select Crypto/USD just like you select credit or debit now. • Phone • Credit card • Crypto checks • Digital Wallet Basically, a two-currency system that allows for software (downloadable programs) to adjust using the same hardware (swipe machines) to handle the business transactions. Transactions on the Crypto side would not be covered under the credit card security system so buyers would need to develop a new security standard.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

In addition to understanding and following anticipated federal regulatory guidance, it will be paramount that financial institutions define what they want their CBDC programs to look like, prior to implementation. This framework should include: • Dedicated staff that's fully educated in CBDC banking and associated regulations • A defined risk tolerance associated with customer activity. • Technical and human resources appropriate for the demographics of our program

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

Yes, only if it is widely trusted by the population, accessible globally and an option is available for a physical currency.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes, It would be the same cards you use today. Maybe have an app on your smartphone that will allow you to switch the account you pull from to make the payment. Credit card options • Credit • Debit • Crypto All would need to be real-time transactions to calculate the exchange rate at time of purchase.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

A CBDC could foster financial inclusion if it allows people to pay digitally without having to have a bank account, without having to have an expensive device to transact and if the solution is broadly available, including in remote geographical areas. In this respect, the CBDC end user device should not necessarily be a smart phone and cheaper devices should be available. It is possible that these cheaper devices, such as smart cards, will not have remote communication capability. It is also possible that remote areas will not offer reliable communication means. A CBDC with offline payment support may therefore be more effective in fostering financial inclusion.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

A possible method could consist in mandating user identification at the time of enrollment but not store any personally identifiable information in the user's CBDC wallet or CBDC device. Rather, a device id or wallet id would be stored and used in transactions. The user id could be bound to the device/wallet id by "CBDC identity custodians" such that only accredited entities (e.g. police forces or customs services) could request, in compliance with rules, the user identity tied to a device/wallet identity. With this method, CBDC transactions would be anonymous in that only device/wallet ids are traced but this anonymity could be lifted by contacting the identity custodian. Alternatively, a user could enroll without user identification, in which case, the knowledge of the device/wallet id would not be sufficient to identify the user. In such anonymous devices/wallets, limits would apply such that only a maximum amount of digital currencies could be stored and only a maximum transaction amount could be spent or received.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

A CBDC with offline payment support will likely be more resilient than one that necessitates online connectivity. In the case communication is lost or servers are down or the system victim of a cyber attack, offline payments between devices would still be possible, albeit for a limited time or a limited number of consecutive offline payments. Offline payments could provide the necessary resilience while the system is being restored. In an offline CBDC system, digital cash may be stored in devices and such a system could therefore serve as a resilient, distributed, store of value offline. Thales DIS proposes that Secure Elements are used in an offline CBDC system and such Secure Elements do not require power to maintain the stored value in their non-volatile memory.

*14. Should a CBDC be legal tender?*

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

In an offline capable CBDC system that supports consecutive offline payments, the payee that receives digital money from the payer can immediately use this money to pay another user offline. This capability will likely require that offline payments be final and instantly settled. In this implementation, the security of offline payments is solely dependent on the payment device. Thales strongly recommends that CBDC devices feature a Secure Element to handle offline payments. To mitigate risk, Thales also recommends that such Secure Elements manage a number of limits, including: - a maximum amount (a maximum balance) that can be stored within the Secure Element, - a maximum amount in any given offline payment, - a maximum number of consecutive offline payments.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Offline payment capability may improve the CBDC system for the following reasons: - It provides for a more resilient payment system with the possibility to transact when the network or online system is down; - It offers a greater reach from a geographical perspective: payments could be possible in remote areas without good connectivity; - It offers a greater reach from a financial inclusion perspective. Financial inclusion calls for the support of a diversity of CBDC enabled devices, not only smart phones. Supporting offline payments allows cheaper, less connected devices, such as smart cards or passive wearables, to be used; - It enables the CBDC system to approach the convenience of cash and may be perceived as more privacy preserving. Thales has built a proposition to support offline payments. A white paper, summarising this proposition can be found here: <https://www.thalesgroup.com/en/markets/digital-identity-and-security/banking-payment/digital-currency>. Thales has begun prototyping the proposed solution in a smart card.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of*

*sale? If so, how?*

To be as ubiquitous as cash, CBDCs must be usable in store, at the Point of Sale. A design that can leverage the existing infrastructure of POS terminals will be cheaper to deploy. Also, today's payment experience at the POS is simple and convenient. For these reasons, CBDC devices will benefit from supporting the communication capabilities of terminals. This is the case for smart cards and mobile phones or wearables with NFC capability.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Quantum computing may impact design choices. Whether online payments on a blockchain or offline payments between devices, public key cryptography is at the heart of today's implementations. The introduction of quantum safe cryptography should be envisaged as an evolution of the system.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Expanded access to a FRB safe asset would foster greater competition among intermediaries. Specifically, this would facilitate entry of non-bank entities that have shown a willingness to innovate in financial products and services. Studies have shown that the needs of poor and middle-income households, those in rural areas, and small businesses are not being met. Pilot studies in a collaboration between researchers and the Federal Reserve should be part of the process of evaluation of CBDC potential (though this idea is not mentioned in the paper circulated for comment).

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

A CBDC with an appropriate design of the payments processor would allow high frequency data to be used to track the economy in real time. This would allow for a more informed monetary policy. Currently, digital payment data must be purchased from private sector entities. Further, monetary policy itself can be improved by better targeting of transfers and liquidity injections.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

There are several papers written simulating the impact on commercial banks. However, implicit in this literature, and the question, is a somewhat defensive posture, with the financial sector thought of as being commercial bank-based. In contrast, one should think of the financial system more broadly, including non-bank intermediaries, using new technologies. How can the U.S. take advantage of new technologies such as programmability and privacy-preserving cryptography to increase welfare and productivity?

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S.*

## CBDC?

There are many initiatives for improved cross-border payments, which will continue to evolve, especially in the absence of a U.S. CBDC. There is also a danger in the absence of U.S. involvement of a much more fragmented international payments system. On the risk of fragmentation generally, see the recent IMF Managing Director's speech: <https://www.imf.org/en/news/articles/2022/05/10/sp051022-md-concluding-remarks-at-the-sn-b-high-level-conference>.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The U.S. should take the lead and help with the design and governance, as per the recent U.S. President's executive order and the initiatives of international agencies.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

To some extent this is a false tradeoff. Modern encryption can protect privacy within a CBDC while dealing explicitly with KYC/AML/CFT concerns.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Ideally, entry should be open and inclusive, to promote competition in the uses of CBDC. However, the existing regulatory structure needs to be revised to ensure implementation of optimized market designs.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

If each of multiple payment devices are tokenized, with 1-1 convertibility to the original, and then put on a centralized platform with CBDC, a coherent scheme for transferability can be achieved. On the other hand, relying on technical bridges only to transfer across multiple payment platforms will make coordination on governance, compliance, and the implied economics much harder.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

The flow should go the other way. What are the current gaps in payments and financial systems that can be mitigated by new technologies?

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential*

*benefits of a CBDC?*

Yes, link current inefficiencies in the financial system to fundamental obstacles to trade and poor market design, then design CBDC and its associated exchange and contracting platform as the tool to alleviate. Look for an upcoming working paper from the IMF using exactly that process in cross-border payments as an illustration of the process.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

A potential benefit of a CBDC is reducing (not eliminating) the corporate pre-eminence that often hampers small U.S. businesses. Established commerce and supply chains, along with complex logistical infrastructures, are intricately connected. Those systems also tend to mainly serve large corporations. When tools and preferences are given to the largest businesses, it obstructs the fostering of a national economy that thrives and grows at its fullest capacity. An "intermediated model" as described in the discussion paper would serve to strengthen and perpetuate the existing large corporate systems. As illustrated, however, it may not provide opportunities for smaller companies to enter the field and compete, which prolongs the lack of an all-inclusive economy. CBDC policy considerations should be geared to address a potential threat to implementation: how merchants are expected to handle refunds without harming their businesses. When would merchants be blocked by an intermediary from using the system? Could they move to another intermediary? Are there transactions or purchases that would freeze or stop the value transfer? The paper notes that cryptocurrencies create a "significant energy footprint;" policies should consider whether merchants could buy or sell CBDC credits (much like real estate air rights). Would the credits come through the Federal Reserve or an intermediary? Could a merchant use multiple intermediaries and buy more energy credits? The CBDC discussion paper raises the issue of a "large-scale shift" of money from commercial banks to nonbanks. Run risks and instabilities could be reduced by programming tiered transaction or storage mechanisms into the blockchain. As with any asset, risks of a CBDC include complete loss of value. The recent crypto crash, for example, shows what could go wrong with virtual currency when stabilized by a programmed algorithm. State-sponsored enemies or domestic terrorists could manipulate algorithms. To prevent financial catastrophes based on manipulated algos, it should perhaps be considered how stabilizing the CBDC in its aggregate could be pegged to tangible assets such as federally owned land, commodities, oil, and minerals.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

N/A

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

The CBDC discussion paper does not address which merchants and consumers would be permitted to use the system. Is there a particular threshold that businesses must attain, such as stellar credit scores, ample cash reserves, or risk insurance? Are there certain industries that will be prohibited from using the system (a supply chain, for example, that includes slave labor)? Could prohibited businesses petition for inclusion (such as by proving merchantability through a probationary period or adding a "co-signer" who has the approved characteristics)? It could take many years and most likely several revisions before a CBDC would be used by the majority of consumers. When a new technology finds its early adopters, there are usually an equal number of skeptics and naysayers working to discredit it. It should be expected that introducing the CBDC will give rise to some significant negativity and serve to hinder the hoped-for financial inclusion.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

CBDC transaction data could be analyzed to discover trends related to employment and factors influencing price-stability.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

More information on the transaction dynamics will be needed to determine the potential net positive or negative effects. Based on the discussion paper, it appears there may be a possibility of the CBDC becoming a somewhat un-influential dynamic in the sea of cryptocurrencies and digital payment transfer systems already available and in use.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Supra.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Supra.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

If the Federal Reserve was able to print an unlimited amount of cash, then it could probably also program an unlimited amount of digital currencies. Preserving central bank money may, however, require pre-programming a supply of digital currencies held in the CB's virtual reserves before a major event occurs. If, for example, merchants announce they cannot accept cash, households and consumers would need immediate access to virtual currencies and learn how to use them quickly.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Absent a U.S. CBDC, new domestic and international systems will most likely continue to be created to fulfill market demands. The vast payments systems could, however, eventually dilute the value of all digital money and render the USD worthless (worst-case scenario). Without the CBDC, the U.S. could appear foolish for not having a digital currency, which would demonstrate a weakness to the rest of the world.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

For the U.S. to remain a competitive "large-economy" nation, it would need to create its CBDC to function as well - if not better – than those of the other nations adopting virtual currencies.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

The CBDC discussion paper does not address the risk of monopolies being formed by large corporations. The original internet was created in the 1960s and funded by the U.S. Department of Defense / Defense Advanced Research Projects Agency. The internet infrastructure has since evolved and is now accessed through telecommunications companies. The CBDC blockchain technology should be open sourced and managed by the DoD or another qualified federal agency. Virtual currency transactions should not be susceptible to outages and "bottle-necking" like the phone and internet companies' systems often are during inclement weather conditions. Data from CBDC transactions should also not be subject to collection by a technology corporation and sold to the highest bidder by an invasive data broker. If the CBDC blockchain is to function as a "public" system, then transactions should be available to the public in the same manner as a public record or court document. CBDC blockchain activity would be best served by remaining accessible through a centralized public database similar to the systems in which court records are maintained.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Nothing on the internet can remain truly private or anonymous. When using a credit card

offline, for example, the transaction information is often shared with or sold to marketing companies. If intermediaries are providing digital wallets to hold CBDC, they should incur the responsibility and duty of care to conduct customer due diligence under the Bank Secrecy Act. When illicit financial activity appears to have occurred, law enforcement should not encounter difficulties tracing transactions back to a user. Transactions on a publicly viewable blockchain could perhaps serve as a deterrent to unlawful conduct. At the same time, however, a public record of a transaction should not appear to be so intrusive that potential users shy away from using the CBDC.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

The CBDC should be designed to operate through a blockchain created, owned, and maintained by the U.S. DoD or an established academic research institution such as MIT. Maintaining a blockchain reliant on a corporation, however, could promote greater inequality and increase the risks of corruption. Corporate ownership or operational management of the CBDC blockchain would not solve those issues that cryptocurrencies were intended to solve, such as decentralized or democratized finance.

*14. Should a CBDC be legal tender?*

Yes. Certain transactions may assist the Federal Reserve in meeting its maximum employment and monetary policy goals. The Federal Reserve could, for example, review how and where the CBDC is spent, which may assist officials with implementing monetary policy. In the same manner that credit card transactions have a merchant category code, the CBDC payment system could be programmed to produce codes for monetary policy. If, for example, CBDC is used to pay employees, transaction data could be analyzed to determine whether the volume matches the number of jobs reported for unemployment statistics. The transaction financial value could also be analyzed to determine price-stability factors. CBDC could also have limited spending power such as being used only to pay taxes or purchase gas and goods tied to the consumer price index.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Yes. CBDC should pay interest when left in a digital wallet or account. As with most assets, savers need an incentive to hold a balance. The CBDC could offer creative ways in which savers may earn interest that are not based on the "traditional" saving methods, (i.e., leaving money alone in an account to earn 1%). A way to encourage maintaining a CBDC balance may promote doing something positive for U.S. society such as investing into a small business fund or social impact bond.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

There should not be a "limit" per se, but to reduce risks, there could be a value "cap" placed on wallets. If a wallet is approaching its limit, it may signify it's time to transfer the CBDC value to a bond or other asset in the blockchain to hold the value and earn interest.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

A licensed financial institution, trust, money transfer agent, or fiduciary with a standard duty of care could serve as an intermediary. While the discussion paper notes that deposit insurance is not necessary, the Federal Reserve should offer some type of an insurance policy to mitigate the risk of loss, theft, or calamity outside of an intermediary's control.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

For lack of a better word, an "amphibious" or a dual-purpose CBDC could offer greater currency exchange mechanisms and value preservation. When switching between an online CBDC to a physical version, an exchange rate could be offered. The Federal Reserve could use the transfer rate to guide its monetary policies by monitoring the exchange rate and transactions. The central bank could, for example, offer better exchange rates to encourage CBDC online to offline conversion or higher exchange rates to discourage conversion when necessary. A dual-purpose CBDC could include a digital wallet that acts as a financial "staging area" or user interface similar to an online checking account. The staging area could offer the "unbanked" population a way to transact "regular" (day-to-day) banking activities. Users, for example, could draw from their current digital wallet CBDC balances to create money orders or checks to print on demand for use offline. The CBDC could be exchanged into other currencies or transferred to an offline bank debit card (virtual or physical). Digital interfacing

could also offer check cashing services, such as by taking a picture of a physical check and uploading it to the staging area. Payday loans could be accessed with a few taps on a mobile device for a quick cash pick-up at a physical location. The information gained regarding how much value moves into the CBDC wallet would be available and could be used to implement controls that help prevent overextended borrowing. Policy should determine whether borrowing or "taking out a payday loan" via CBDC comes from the intermediary or the central bank.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

To stay competitive with all of the other digital payment systems, the CBDC needs to be easy to use. With a dual-purpose amphibious wallet, for example, users could have the option to transfer value from a digital balance onto a physical refillable debit/credit card so that it could be used with merchants that don't accept CBDC. It should also be an immediate transfer, such as when moving money from one account to another when logging in to a bank account online or through an app.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Supra.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

It depends on how the CBDC blockchain is created and controlled. It should be open source, accessible to the public, and maintained by the U.S. DoD or another federal agency. There should not be a reliance on a corporate entity that can control the price and parameters of the technology facilitating U.S. virtual currency transactions. Microsoft Windows, for example, updates its system whenever Microsoft decides it's time to upgrade even if the system is operating just fine. There's no way to effectively stop the process. When the Microsoft upgrades alter a user's system, however, it can carry a nuisance factor; the user did not ask for or need the updates but must comply with Microsoft's dictates. If the user loses software or finds unwanted "apps" on the upgraded system, for example, it requires removing the unwanted apps or taking time away from important activities to reinstall missing software. Critical technology such as the CBDC blockchain should not be modeled on Microsoft Windows. It should also not rely on a single corporate entity's updates or cyber protection structure that changes based on its profit seeking motives.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

The most appropriate design principles would entail creating virtual currencies displaying the Statue of Liberty, American bald eagle, and Eye of Providence shown on the U.S. \$1 bill.

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*Name or Organization*

*Industry*

Technology Company

*Country*

United States of America

*State*

District of Columbia

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

1. As digital currencies in both the private and public spheres are adopted over time, the continued absence of a Federal Reserve CBDC would indirectly blunt financial inclusion. The dollar is the global store of value, and equitable digital access will ensure that all groups may benefit. Similarly, the transparency that a CBDC offers will directly combat corrupt elements that would otherwise crowd out access for marginalized groups. 2. However, ownership of a smartphone or other hardware, sufficient data availability, and reliable connectivity are just some of the prerequisites to meaningful participation in a CBDC environment. Unfortunately, these are out of reach for segments of the US population that stand to benefit the most from the efficiencies of a CBDC (lower income, rural, elderly, etc.). 3. Our patented digital payments technology, Payala, addresses the issue of inclusivity by utilizing an inexpensive smartcard as the ticket to entry to an e-money ecosystem, including for CBDCs. Please see our answers to questions 13 and 18 below for a more detailed treatment of how Payala solves for operational resilience, offline transactability, cybersecurity, and inclusion in a CBDC or other e-money context.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

1. Net Positive. It would facilitate instant stability mechanisms such as stimulus payments, social safety nets and enormously simplify tax collection, both of which are essential for stability 2. A CBDC would enable the Federal Reserve to monitor flows in near real time, enabling micro interventions at the first signs of instability inside the real economy, and the ability to geolocate problems, enables smaller more targeted interventions which have a lower macroeconomic impact and overall financial stability impact than very broad stimulus measures 3. By allowing instant capital movement it would enormously increase the efficiency of capital allocation 4. But operational resilience and cybersecurity are crucial to ensure the positives outweigh the negatives

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

1. Integration of the CBDC as a form of 'cash' in addition to physical cash is simply another tool and would not have an effect on core bank functions other than the safekeeping and transfer functions which are already partially taken by non bank financial service providers 2. A CBDC platform with easy and open integrations would allow other service providers to innovate on the platform reducing rents in the financial system which are currently monopolised by large banks 3. By forcing banks to concentrate on competitive lending and other bank portfolio services, it would increase competition which in turn should result in more efficient capital allocation

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

1. Yes, it's essential that an absolute last resort system exists for resiliency 2. Please see our answers to questions 13 and 18 below for a detailed explanation on how our Payala digital payments platform addresses the issue of operational resiliency, with exceptional cybersecurity and true offline cash-like transactability.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

1. Cryptocurrencies might take over this task, fostering money laundering opportunities, shifting security responsibilities on to end users and creating a digital divide by being access to wealthier individuals and corporations due to the nature of their transaction fees 2. In addition, the lack of governing oversight that enables money laundering directly undermines the stability that the dollar brings to the global economy.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

CBDC provides a material competitive advantage to a state that implements a well thought through and executed one, especially if it is open to outsiders, as ease of use is a contributor to acceptance and trust.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

1. Innovations like our digital payments technology, Payala, which is are specifically designed to manage the risks of unreliable infrastructure/connectivity, cybersecurity, and inclusivity, which present key challenges to the functionality and integrity of a CBDC ecosystem. 2. Please see our answers to questions 13 and 18 below for a detailed explanation on how our Payala digital payments platform addresses the issue of operational resiliency, with exceptional cybersecurity and true offline cash-like transactability.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

1. Ultimately any technical measures are subordinate to policy and legal safeguards. It's impossible to meet all of the policy goals of a CBDC via purely technological means 2. A suitable regulatory framework would have to include checks and balances to prevent overreach as well as adequate transparency and control. These aren't technology questions, but cut to the core of the role of money in society and as such should be debated openly and honestly with stakeholders and the public

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

1. Operational resilience (particularly offline capabilities) and resistance to cyberattack are critical for the integrity of a CBDC. Our solution, Payala, is a patented, cryptographically secure digital wallet service on an NFC (contactless) card and a cryptographically assured backend ledger which allows instant payments, both remotely and locally when on-line, and locally when off-line (i.e., when the mobile phone or Wi-Fi network is down, or no network is present). 2. The smartcard provides a far more challenging prospect for hackers than a digital payments system that resides on smartphones, particularly when many smartphones still in use are outdated and easy to exploit. 3. Even with exceptional cybersecurity, like Payala, here are some unavoidable risks such as cryptographic class breaks due to unexpected breakthroughs in mathematics e.g. number theory or a working quantum computer 4. In the event of all out attack involving EMP generating weapons or EMP optimised nuclear weapons it is possible that all devices in wide area might be destroyed. Therefore it is imperative that there still be physical legal tender still kept in reserve. 5. While it is possible to build in a great

deal of redundancy, it is possible that there might be supply chain problems or hard breaks which make it impossible to produce devices or microelectronic components for a prolonged period if they cannot be made inside the United States. While it can be assumed that there is some base level of technology will survive any attack, what that level would be is currently open to debate as to the functioning of the United States Government would be under such conditions.

*14. Should a CBDC be legal tender?*

Yes

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

This is a wider discussion around how much value should anyone be allowed to have with no scrutiny or supervision

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

1. Banks, Credit Unions, Other Financial institutions could brand their own wallets and allow other value added functions 2. Everyone should be able to get a wallet at cost from the CB or FI of last resort

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

1. Yes, this is essential for inclusivity and operational resilience of the CBDC 2. Our Payala digital payments system features a patented and robust offline transactability that we believe is unparalleled in the industry. We have shown that it is possible to implement a ledger with the property that it can be made massively redundant with partial snapshots on hardened devices (e.g. smartcards with a very limited attack surface) and built in such a way that a central location has the ability to order transactions in relation to each other using single use keys to sign transactions. With appropriate cryptography, it's possible for wallet devices to check the validity of balances and integrity of ledger instances, and therefore make it possible to transact offline, as at all times devices can validate balances AND be able to correctly order events relative to each other. When transactions take place offline, the wallets and devices used to conduct the transactions all keep receipts which have the transaction details along with the cryptographic information needed to correctly order the transaction relative to other transactions. When devices come online again it's possible to then upload information to a central location and discard any redundant information. \*Please do not publicly disclose the link below\* A full commercial write up of this mechanism as implemented in the Payala technology platform can be found here: [https://drive.google.com/file/d/14dsfdAvjW-eCljRSgOXmhDjNN-cOdJpq/view?usp=sharing](https://drive.google.com/file/d/14dsfdAvjW-eCljRSgOXmhDjNN-cOdJpq/view?usp=sharing)

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

1. Using common existing commodity hardware standards like NFC (ISO 18092) and open reference implementations of whatever software is required to implement the chosen solution should allow hardware vendors to incorporate necessary hardware into all manner of devices 2. There would need to be a list of requirements to meet a minimum security requirement as set out by the Fed.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

1. If a CBDC is treated as digital cash, it can exist alongside payment technologies fairly easily 2. Cash is a CB function and in this regard the CBDC would function in the same way, except that it would make liquidity immediately available while connectivity was available

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential*

*benefits of a CBDC?*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

CBDC being a cyber entity, it may be imposed upon any set of terms and conditions, cryptographically expressed, and cryptographically secured. This notion known as "Tethered Money" (see our book "Tethered Money" published by Elsevier) is expected to revolutionize government payment for social causes, and for innovation projects. Tailoring money to its intended use -- with cryptographic assurance -- will greatly affect the credit market, charitable giving, and high-risk projects. The idea being that today's armies of accountants and legions of lawyers who chase misuse of funds, will be no longer be needed because paid money will be limited to serve its purpose and no more. One important aspect of tethering money is the power of the Federal Reserve to time limit the validity of its use. When a CBDC coin expires, it must be exchanged against a new valid coin. This flashes out its holder -- unlike physical cash that survives forever and is the pillar for the criminal element in society. Another point for consideration is the idea that CBDC amounts to a solution to write money as a string of bits that has both an identity and a value. This is a groundbreaking idea that should be used to create a new cyber financial language to be used to express money written in computer databases, and in general be used by any financial instrument. A most important aspect of CBDC is the unique opportunity to eventually change the national tax base from taxing income to taxing wealth. Since all CBDC money will be listed as a central bank liability, regardless of who holds them at any particular moment, then it would be possible to levy taxes on these coins by either randomly, or uniformly cut a value from them in favor of the federal government.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

We propose to view the challenge of CBDC as comprised of two distinct parts: payment, and liquidity, where payment refers to the mechanism, the protocol, the dynamics of money in society, and liquidity refers to the essential nature of the new form of money. Payment is akin to the railways, and liquidity is akin to the train running on the railways. As we have done for other central banks, we propose to start with the payment -- build the railway -- and when done, to build the new form of money to ride on it. The payment defines the transactional configuration, it is naturally practiced using digital claim checks for nominal dollars. These claim checks don't impact liquidity. Each claim check is purchased with liquid dollars that are kept liquid ready to respond to an instant claim of redemption. These claim checks circulate in society and eventually are redeemed for the same dollar amount for which they were purchased. As far as the payment mechanism is concerned these digital claim checks move through the payment protocols the same way that the CBDC entity will move about. The experience gained with the digital claim checks will serve us to introduce the CBDC with minimum friction.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

CBDC achieves an embodiment in cyber space of the notion of physical cash to the extent that a string of bits encompasses both value and identity. As such CBDC can be safely kept in its owner's phone -- stored, transacted, accounted for, with no need for any registered account with any financial institution -- cash-like. For example, a new not-for-profit entity PayUA was just established by a US senatorial candidate, to use digital money technology to

push cash to Ukrainian refugees' cell phones (denominated in the host country currency), no account needed, money flows between phones cross national borders. Since the central bank will control both the issuance of CBDC and its redemption, there will exist the means to ensure proper use of the CBDC, and achieve liquidity balance, despite an arbitrary level of anonymity for the in between traders.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

The Federal Reserve will enjoy newly gained tools to affect monetary policy by issuing CBDC associated cryptographically with any desired use limitation. This is the ground-breaking idea of releasing money to the public, and limiting the use of that money to serve any goal desired by the Federal Reserve. The essence and the means to achieve this capability are documented in the book "Tethered Money – Managing digital currency transactions" published by Elsevier Academic Press, authored by the undersigned, professor Gideon Samid.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

CBDC on one hand creates a payment privacy ecology which allows for experimentation and innovation to flourish and creates prosperity, and on the other hand it allows for CBDC coins to be channeled to flow in ways deemed by the Federal Reserve to be helpful for its canvass of objectives. Money as a string of bits is money that is subject to rich cryptographic guidance. We have demonstrated such guidance with BitMint's platform, successfully implemented in big city banks.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

CBDC will affect dramatically the financial sector since CBDC coins operate on a platform defined by the Federal Reserve. First, limiting the fungibility of money will fundamentally cut down fraud and money laundering. The fact the all outstanding CBDC coins are listed (even if their current owner is not known) means that eventually wealth-based taxation will replace today's income-based taxation, creating a more just taxation ecology. Stable coins rely on the mechanism used to achieve their stability. CBDC is per definition stable.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

The main adverse impact of CBDC on the financial sector is the replacement cost of the current system with the new one, including training and gaining experience with CBDC payment. No special tools needed.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Cash, whether physical or account-based, will be replaced with cash-like CBDC which will serve all the objectives served by cash today.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

It will be catastrophic. We worked for years with China, Germany and others. They all eye the US market, to offer anonymous cash-like digital coins and effective cross border payment. If the US stays in the 20th century we will be devoured with foreign payment systems that cannot be stopped at our national border. The US must offer its citizens the benefits of this new groundbreaking technology to fend off foreign interest.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

See our reply to question 9.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Sure. The paper relies on the prevailing cryptographic tools which are all vulnerable to the fast-approaching quantum computers. At a close point in time in the future even wire transfer,

not only blockchain will be compromised. There is clear consensus in the cryptographic community as to this vulnerability and still it is widely ignored. We developed our solutions on quantum-resistant technology, which attracted the attention of the Chinese PBOC, who chose to try this IP in a real-world retail CBDC pilot.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

We point out a near perfect solution to this balance. It is modeled on the 4th amendment to the US constitution: ordinary privacy to citizens with inescapable exposure before a court order. We do so by applying KYC to the first trader of CBDC coins and to the redeemer thereto, while allowing all in-between traders to remain anonymous through advanced quantum-resistant cryptography. By announcing on a public ledger that a given CBDC coin will not be redeemed unless certain terms are met, the FedReserve will effectively stop that coin from circulation. Its anonymous holder will have a choice either to give it up (since no one will accept it as payment any longer), or to come forth, identify himself/herself and explain how the money was paid to him/her.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

The most important resiliency factor is off-line trading. One must account for Internet jamming, and break down due to mistakes, accidents, terrorism etc. Payment continuity is a must and CBDC must be associated with offline payment on an indefinite basis. We have designed a robust solution to this challenge -- a new trust vector. Instead of trusting the money or the payer, we propose to trust the wallet -- a hard wallet. The cryptographic risk of the prevailing ciphers is very worrisome on account of the looming quantum computers, and therefore we build our solution, and every solution should be, demonstrably quantum-resistant.

*14. Should a CBDC be legal tender?*

Yes. Again, because it can be implemented with insuring payment continuity despite Internet difficulties and because it is the natural progression from metal lumps to metal coins to paper money, now to cyber money.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

CBDC is cash-like and should not pay interest. However commercial institutions will be able to apply the very same technology to mint digital claim checks for CBDC, and these digital claim checks may bear interest.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

No, and the way we see it, being cash-like, with the identity of the current owner of a CBDC left unknown, it will be impossible to enforce any such limitation.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Banks and financial institutions should serve as active intermediaries and use the very same technology to issue digital claim-checks backed by CBDC, these claim-checks will enjoy much greater flexibility as to shaping them with a variety of limitations. This operation is recursive, the first digital claim-checks are based by CBDC, and second degree digital claim-checks may be backed by first degree digital claim-checks, etc.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Definitely. Payment continuity is a must. The Internet will jam or break down every so often and payment cannot be stopped. Off line payment is best achieved via introducing a new basis of trust: not the money itself, not the payor, rather the hard wallet that holds the money. A new nano technology IP allows for construction of such hard wallets (US Patent 11,062,279) which pay one to the other for as long as the Internet is compromised.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

CBDC should be used to take advantage of the full range of capabilities unique to it. In particular CBDC payment is instantly finalized removing the tiresome settlement efforts today.

Since acceptance will be cash-like based on recognition of the money not the payor, the payment event will be instantaneous and final. This will be the case whether the CBDC itself is passed around at the point of sale, or alternatively, a digital claim check thereto is being passed.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

We designed and described an InterMint -- a protocol to achieve seamless exchange between national CBDCs based on unified publicly known dynamic exchange rates. Little new technology is involved. Details appear in chapter 20 in the Handbook for Digital Currency published by Elsevier Academic press, 2015.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

We envision two important areas of fundamental future innovation: (i) better risk management, credit policy, and investment strategies to ensure that talent and money come together to meet societal challenges, and (ii) more elaborate device-to-device payment, creating a payment ecology in the Internet of Things. We have raised our CBDC design to become a new cyber financial language applicable to everything financial.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

The most important under-recognized design principle as we see it, is the idea that CBDC should be built to last, namely, should be designed to withstand any foreseeable future development. More: CBDC should be designed to withstand assault by attackers smarter than its designers. This principle of adverse-innovation resiliency should be taken seriously. It is therefore that we highly recommend to build CBDC in a form that is the simplest mathematical way to combine value and identity, and to base its security on perfect (physical) randomness, not on algorithmic (fake) randomness.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

In general the paper should address the issue of modern monetary theory and fractional banking as a source of liquidity in the domestic and international economies, and the impact that the US-CBDC would have on this. It should also contrast the policy proposal with other proposals which Congress may seek to explore such as fully tokenized frameworks (eCash concept). We do not believe that the design of the eCash concept will sufficiently secure tokenized “cash like” instruments. The paper should explain the ways in which other countries are introducing CBDCs and how the US approach would be different. Based on what we have seen in other countries, the Central Bank should offer the CBDC via an intermediary bank; a two tiered approach is highly preferred. Given zero transactional fees, it is possible this could begin to dominate transactional volumes, thus creating a risk to the overall banking system, again, unless offered via an intermediary bank and done in a guaranteed open loop system where different service layers could be offered.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Faster payments (FedNow) may ameliorate some of the pain points in the existing payment and banking systems, and reduce the need for a US CBDC at a wholesale level. However retail CBDCs reaching the widest range of the population including the unbanked and underbanked requires near zero transaction fees. To achieve this, fraud, onboarding/recovery and dispute resolution costs need to be eliminated as promised by retail CBDC systems and alternative data monetization strategies will be required to replace transaction fee models thus invoking consumer, merchant data rights issues that need to be balanced with compliance requirements.. Further more such a system needs to be an open-loop payment system that provides reasonable and non-discriminatory access to all financial institutions and intermediaries. In summary although we do have robust digital payments infrastructure in the US there are inefficiencies causing friction for merchants. The current interchange fees of Visa/MC present friction in payments for merchants. Mobile money solutions are walled gardened and can lead to data monopolies by big tech.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Yes, CBDCs could accelerate inclusion or exclusion, depending on the design. Design should take into account many of the aspects highlighted by international bodies including the IFC, UNCDF, Asian Development Bank, OECD and others in the formulations found in the Monetary Authority of Singapore's August - November 2021 "Global CBDC Challenge". [https://tribex.co/wp-content/uploads/2021/06/Global\\_CBDC\\_Challenge\\_Problem\\_Statements.pdf](https://tribex.co/wp-content/uploads/2021/06/Global_CBDC_Challenge_Problem_Statements.pdf) In particular, design should neither assume data connectivity nor availability of a smartphone. There should be form factors that allow for widest possible use in retail and interpersonal transactions. Extolabs was successful in demonstrating as one of the Finalists in the MAS Global CBDC Challenge our innovative edge cryptographic solution that successfully secures offgrid transactions with a mixture of account and tokenized attributes using low cost and secure hardware wallets and expiring currencies. Reaching the underbanked unbanked in the US may require money agents similar to what has developed in emerging markets with mobile money agents acting as cash-in/cash-out points. To do so, efficient and trustworthy means of onboarding and KYC by third party agents is required.

CBDCs can uniquely reduce costs and get small merchant adoption for these communities as well as provide added security and get around costs such as overdraft fees, all of which are friction points for the underbanked. Our solution, ExtoPay utilizes edge cryptography and signed transactions enabled on low cost devices that can last months to years. On device biometric or PIN based authentication, hardware enclave, and low power modes enabled by innovative patent pending technologies. We are then taking this solution to key markets, such as India as they expand into a pilot phase for a CBDC linked to the banking system and the unique id system running there.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

The programmability of CBDCs with proper privacy frameworks could allow for unprecedented near real time visibility of impacts of monetary policy with consumers and businesses. For instance by operating nodes of DLTs of even intermediaries, where only transaction data is visible but no identity data the Federal Reserve could have a near real time view of consumer and business spending behavior. Level 3 data collected from a merchant point of sale system could provide fine granularity on types of purchases and pricing. All of this can be in near real time, at the aggregate level but based on demographics and regions. The privacy aspects of such visibility can be managed by keeping all personal identifiers separate and only accessible to the regulated financial institutions. Strong consumer opt in for even sharing such anonymous aggregate data can also be put in place.

The Federal Reserve may not be able to sufficiently influence the liquidity available in market unless it makes CBDCs available in a two-tiered structure, and allows banks to use the issued CBDCs as a source of reserve currency. Quantitative Easing mechanisms may not be as effective, although that should be explored in future papers. It is important to have intermediary banks acting between commercial banks. We recommend in all cases, for cross border, and for domestic, that there is an intermediary bank. The intermediary bank then provides guarantees of privacy and increases the liquidity available.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

First, given the key role that the US Dollar plays as the global reserve currency and its role in global commodity pricing and transactions, the CBDC design has significance. As CBDCs gain in popularity globally, there is a potential for missing out on a new "reserve currency" long term. CBDCs, if issued via intermediaries, would potentially disrupt the current Central Bank currency over time. It would be important to have sufficient throttling in place to avoid massive shifts of currency.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

The largest risk would be if CBDCs are issued directly to consumers. This could shift deposits out of banks and impact credit facilities banks provide to the market. This is the main reason to pursue a two tier system where Banks are still holding the CBDC deposits on behalf of consumers and businesses. The risk of CBDCs in crowding out the USD in global markets should be anticipated. This should be by design but the transition to CBDC should be carefully managed with appropriate trading stops and regulated futures.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

The most powerful tool would be to adopt the two tier distribution model where financial intermediaries are still in the loop. This addresses risks without impacting the design of CBDC systems. It would however require an open-loop payment layer for wallets issued by such intermediaries to be able to transact with each other. This can be achieved via an inter ledger layer which connects the private DLT ledgers of each financial intermediary. Such an approach can also overcome privacy concerns and the Federal Reserve will not have access to KYC data of consumers or businesses held separately by regulated financial intermediaries based on current compliance and privacy rules.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes, public access to a digital CBDC or physical note will ensure that the public always has a baseline alternative to commercial offerings. Private operators may offer similar services with many value adds that consumers find appealing, but should never be in a position to levy unlimited tolls on commerce.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

In the absence of a US CBDC, we anticipate that networks of protocol based “currencies” with automatic pricing and hedging will evolve, and without sufficient oversight and transparency will open up new avenues for arbitrage and exploitation of currency risk. Domestic payments are likely to further fragment into different stable coins and/or move to the FedNow system with a high degree of consumer confusion over what is being transacted and by whom.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The US should maintain a leadership position. CBDCs issued by competitive economies may seek to denominate debts and payment flows in those alternatives and thus diminish the role of the US Dollar as the reserve currency.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Operational risks deserve greater attention as securing the “printing” (issuance) and “destruction” (retirement) of the CBDC token or units will be important to get right. When considering central ledgers versus DLTs, the additional security and resilience possible by DLTs should be evaluated not just scalability. Supply chain and operational security will be of paramount importance.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

At the level of transactions, the identity of the person in the transaction should be proportionally tied to the size of the transaction. Moreover, strongly enforced and time limited opt-in rules and consumer data ownership rights should be proposed as a counter to the tendency for private actors to seek all data from all transactions at all times. Identity data should be kept separate from transaction data. Edge based cryptography and Zero Knowledge Proofs can bring significant privacy protection from counter parties collecting data without consumers opt-in.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

A CBDC design should adopt edge-based security as is familiar in cryptocurrency systems, regardless of whether a DLT is used to record transactions on the backend. This methodology encapsulates transaction parameters in digitally signed messages that are immutable, idempotent and unforgeable. Such messages can then be safely transmitted over insecure, unreliable and asynchronous communication channels. If any portion of the system is unreachable, messages may be saved for replay at a later time, subject to expirations encoded in the transactions. Every transaction eventually recorded on the ledger can be unequivocally attributed to the possessor of a certain private key. Ideally, private keys are generated within secure hardware enclaves which they never leave to ensure that only a single copy exists. Where duplicates are desired e.g., to allow for loss or sharing, alternative cryptographic methods should be sought. When a customer hands a banknote to a merchant, both can readily agree when the transfer has completed. Such agreement cannot be assured when a digital message is sent over an unreliable channel. E.g., if the sender fails to receive an acknowledgement, it could be that the original message was lost, or the acknowledgment was lost. This problem is known as the “Two Generals Problem” and is known to be unsolvable. Consequently, no CBDC payment system can guarantee real time finality. This presents a challenge for in-person payments where each party would like to walk away with certainty that a payment has either been made or has failed. Conventional card payment systems rely on tamper-resistant Point of Sale devices as an authority which both merchant and customer can trust. If it shows the transaction is approved or failed, it can be relied upon to ensure that the backend eventually records that same result, even if connectivity is lost during a transaction. If these mechanisms fail, one party or the other may notice a discrepancy on their monthly statement and raise a dispute with the payment service provider. ExtoPay operates in similar fashion, but equipping end-users with a tamper resistant device that can “finalize” transactions locally over peer-to-peer connections, with asynchronous settlement on the backend, when connectivity is available. This local “finalization” remains subject to settlement risk, but only for the case where a hardware device has been compromised, much like the case of accepting a banknote that later proves to be counterfeit. In the case where WAN connectivity is available, this risk can be

immediately removed, greatly diminishing the potential proceeds from an attack on the hardware.

*14. Should a CBDC be legal tender?*

Yes, a CBDC should be legal tender.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

No. This would make it a competitor to banks and could potentially encourage consumers and businesses to keep their balances as CBDC as opposed to keeping them in a bank account. This can adversely affect assets of banks and credit they make available to the economy.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Assuming a two tier system where the amounts held are still considered to be on the books of a bank then no. But if its a direct issuance by the Federal Reserve to consumers then yes there should be limits in order to avoid impacting the banking sector's balance sheets.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Banks so that they CBDCs held by their customers show on their balance sheets but facilitated by payment service providers and fintech, as long as the open-loop system is maintained and consumer privacy is addressed and no data monopolies are formed. Service providers that abide by certain protocol requirements and new compliance regulations should be allowed to have a key role in offering channels and payment mechanisms.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes. CBDCs should have offline capabilities, at least for last mile transactions. Offline capabilities can be modeled after conventional paper checks, but where signatures are unforgeable digital signatures. If the private key required to sign checks is known only to a tamper-resistant hardware device, and the tamper resistant hardware is provided an accurate starting balance, it can be relied upon not to overdraw available funds. To guard against hardware compromise, checks can be settled on the backend ledger before allowing the recipient to spend. To limit the proceeds of any hardware compromise, offline spending ability can be bounded by a maximum amount and an expiration date. These parameters can be conveyed to potential counter-parties in a "Spending Authorization" signed by the Payment Service Provider. In that sense, the Spending Authorization is like a Certified Check, with the recipient and amount left blank, but subject to an upper limit. Fraudulent accounts can then be disabled by not renewing Spending Authorizations. Counterparties can be further protected by providing a block list of fraudulent accounts whose Spending Authorization may still be valid. In order to be more appealing than cash, a CBDC should protect the owner against loss. However, the private key that controls the account cannot be duplicated outside the device without introducing the risk of double spending. Thus, an independent recovery key should be associated with the account that is able to authorize a special transaction: disable the account and designate a recovery account to which any funds that remain after a Time Lock expires can be transferred. The disable operation can block issuance of any new Spending Authorizations while still allowing any outstanding, non-expired transactions to settle. If the owner in fact remains in possession of their device and attempts to refresh the Spending Authorization before the Time Lock expires, they will discover their account has been disabled, and can abort the recovery, by presenting a transaction signed by both the original account key and the recovery key. Hence, an attacker who acquires the recovery key cannot take over an account as long as the device owner makes regular use of their device. We believe that the ExoLab protocols and approach should be part of a new emerging standard.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes, assuming a direct to consumer CBDC, rather than a two tiered system, then for sure the acceptance networks and ability to push transactions from device to device and to bank accounts upstream will be important and frankly a challenge given the Federal Reserve's ability to onboard both consumers and merchants at scale. Point of sale transactions are the main contact people have with the use of currency on a daily basis. Disruptive point of sale solutions are needed so that the current costs of interchange are not imposed on CBDCs. Such merchant point of sale systems which can be a smart phone or a hardware wallet are as critical as the consumer wallets if not more so as this is where some of the most important

data of value to the Federal Reserve's monetary policy can be gathered (with consumer/merchant privacy issues addressed).

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

DLTs can interface with banking and other payment APIs. Proper secure interfaces need to be supported by DLTs or other ledgers used for CBDC issuance. FedNow or other universal API to bank accounts should be considered. UPI in India has achieved great success in bringing efficiency to payment rails while still keeping the financial sector engaged and stable.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Programmability of CBDCs is one of the most important aspects of how both the Federal Reserve but also other actors in the ecosystem can benefit from CBDCs. Scalability and programmability are still moving targets and ideally permissioned and private distributed ledgers can be optimized to handle the scale required. There are many benefits to DLTs not as open networks but in the private/permissioned context that can result in openness and resilience of CBDCs.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

For example, and speaking for some members of the team (James Dailey and Orang Dialameh): An additional design principle could be around a co-benefit to help bring climate risk under control. For example, the design could require purchase of carbon offsets for each minted CBDC, thus creating a massive market demand for such offset projects globally and especially in the US. Initial design could be 0.5% of all issued currency must be backed by a carbon offset credit and ramp up if such funds are insufficient to incentivize market shifts.

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*Name or Organization*

Better Identity Coalition

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Trade Organization

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1. *What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*
2. *Could some or all of the potential benefits of a CBDC be better achieved in a different way?*
3. *Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*
4. *How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*
5. *How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*
6. *Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*
7. *What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*
8. *If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*
9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*
10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*
11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*
12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*
13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

14. *Should a CBDC be legal tender?*

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

We were pleased to see the Federal Reserve note that any CBDC should be “identity verified.” Identity is far and away the most commonly exploited attack vector in cyberspace; the vast majority of breaches each year leverage compromised credentials to get into systems, and FinCEN last month flagged a sharp uptick in identity-related financial crimes, noting “In 2021, financial institutions reported to FinCEN a substantial year-on-year increase in potential identity verification, impersonation, and compromise-related suspicious activity.” This followed remarks from FinCEN’s Director in 2019, stating “The abuse of personally identifiable information and other building blocks of identity is a key enabler behind much of the fraud and cybercrime affecting our nation today.” Strong identity solutions are needed to help protect consumers’ money and data, prevent financial crimes, protect privacy, and guard against identity theft. Against this backdrop, we note that it will not be feasible to create an identity-verified digital currency without also ensuring the United States has adequate digital identity infrastructure. Unfortunately, there is a gap between the kinds of identity verification solutions available to support physical transactions – based on nationally recognized, authoritative government-issued credentials such as driver’s licenses, birth certificates, and passports – and the solutions available in the digital domain. While industry innovation has helped to fill this gap, the Coalition believes that government must also play a role. The Better Identity Coalition has endorsed H.R. 4258, the Improving Digital Identity Act of 2021, as the best way for the United States to close the gap between physical and digital credentials. This legislation would ensure that the government enhances the security, reliability, privacy and convenience of digital identity solutions that support and protect transactions between individuals, government entities, and businesses, and that enable American to more easily assert and protect their identity online. As efforts to create a CBDC advance, we urge the Federal Reserve to continue its focus on the importance of identity verification, as well as highlight the importance of legislation such as the Improving Digital Identity Act as a way of ensuring the country has adequate digital identity infrastructure to support the requirements of a CBDC.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The Federal Reserve's initiative to open a dialog regarding CBDC, and to reach out to the public for feedback, are encouraging steps forward. However, this dialog should expand its scope beyond CBDC, and include blockchain-powered currencies and assets, as a diversified, robust strategy to maintain and expand the global influence of the United States, and ensure our National Security and dominant global financial status. Specifically, the dialog should: Consider the potential of a public / private partnership with USDC or other stable coins; Address in detail the CBDCs issued or developed by other governments, as a matter of National Security; Ensure that privacy considerations as well as impact of government monopoly imposed on the financial system are thoroughly addressed; Leverage the extraordinary level of innovation and experience of the private sector, independent developers, Bitcoin miners, etc.; Include discussions around cryptocurrency regulations; regulations unfavorable to crypto will severely limit the ability of our nation to rely on a diversified portfolio of digital currency solutions. By the Federal Reserve's own admission: "Today, the dollar is widely used across the globe because of the depth and liquidity of U.S. financial markets, the size and openness of the U.S. economy, and international trust in U.S. institutions and rule of law." So, the future solution beyond the dollar should be the one that further enhances our financial system and the openness of our economy. Such a solution can only arise from a diversified approach, reflecting the very openness and inclusiveness of our system, and not from blindly embracing government monopoly.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

The decentralized nature of blockchain-based solutions such as Bitcoin will increase the competitiveness and stability of the US financial system by: 1. Providing assurances that the government will not interfere in private transactions 2. Ensuring basic privacy rights 3. Being invulnerable to attack from a single node. Historically, it seems like the choice has largely been between security/privacy or convenience/fungibility. CBDCs preserve the convenience/fungibility while almost entirely removing the security/privacy benefit. Bitcoin manages to provide both.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

7. *What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*
8. *If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*
9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*
10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*
11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*
12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*
13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*
14. *Should a CBDC be legal tender?*
15. *Should a CBDC pay interest? If so, why and how? If not, why not?*
16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*
17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*
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20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*
21. *How might future technological innovations affect design and policy choices related to CBDC?*
22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Intentionally blank

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Intentionally blank

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Intentionally blank

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

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Intentionally blank

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Intentionally blank

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

To: The Board of Governors, The Federal Reserve System, United States. We write in response to the call for public comments to Money and Payments: The U.S. Dollar in the Age of Digital Transformation to contribute a civil society perspective amid evaluation of a potential United States Central Bank Digital Currency (CBDC), sometimes referred to as a “digital cash”. This letter answers question 12: “How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?” Any CBDC or government-backed form of digital cash must have anonymity equivalent to or exceeding paper cash — or as close to such anonymity as technology makes possible. Anonymity should be a paramount consideration in pursuit of a more just and safe financial system. Although physical cash is subject to counterfeiting and use in crime, we have always absorbed certain costs as a society in exchange for the enormous benefits that physical cash brings. We should similarly be willing to absorb proportional costs in exchange for the benefits that government-backed digital cash could bring. The financial privacy of everyday people must come first. Strong encryption is crucial in ensuring safety in the digital world, and must be exploited to the greatest extent possible in the design of any digital cash developed by the US government. Privacy must be, to the greatest extent possible, protected by technology—not merely by statutory privacy protections which will not give people the confidence that their privacy is protected that they both expect and have a right to. Placing surveillance backdoors in every American’s wallet in pursuit of incremental progress on reducing crime will do more harm than good and undermine human rights. It is also important that, like cash, CBDCs be designed to be universally accessible and exchangeable for goods and services without transaction fees. To the extent possible, the government should aim to issue anonymous digital cash that users can transfer directly to each other without fees, tracking, centralized ledgers recording every transaction, or requirement for a smartphone, tech savvy, or an internet connection. Money should be private and permissionless. Just as with physical cash, there should be no middleman tracking every use of CBDCs or blocking transactions it does not like. Overbroad application of securities and anti-money laundering rules in ways that threaten to expand government surveillance or censorship of the financial transactions of everyday people, NGOs, and small businesses broadly threatens privacy and equity. Financial regulators should consult with technologists and human rights experts to determine appropriate architectures, technologies, and policies to address fraud, abuse, and money laundering where possible and without infringing on human rights or privacy. New technologies may make it possible for the largest actors to be held to account while protecting the privacy of ordinary people transacting at levels below the current \$10,000 cash reporting requirement. But a transition to public digital cash should not become a reach for a totalizing solution to every possible crime that is achieved by throwing privacy overboard. As with other illegal transaction vehicles (paper cash, art, diamonds), the authorities already have broad investigatory powers at their disposal to investigate illicit transactions, and those powers can be brought to bear on illicit digital transactions as well without baking surveillance into the very architecture of our new money. Creating a new form of money is a big step. If it is to be done, it must be done right. CBDCs should be a public good that is available to all and that, to the greatest extent possible, replicates the advantages of physical cash—especially privacy, anonymity, permissionlessness, and accessibility for all. Signed, ACLU Fight for the Future S.T.O.P. - The Surveillance Technology Oversight Project Muslims for Just Futures San Francisco Public Defender Restore The Fourth RootsAction.org Constitutional Alliance Erotic Service Providers Legal Education and Research Project (ESPLERP) Yale Privacy Lab Organization for Identity and Cultural Development (OICD) Advocacy for Principled Action in Government

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Intentionally blank

*14. Should a CBDC be legal tender?*

Intentionally blank

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Intentionally blank

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Intentionally blank

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

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Intentionally blank

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Intentionally blank

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Intentionally blank

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Some people do not wish to maintain a custodial account relationship, so there is no advantage to an account-based CBDC for these individuals. However, a token-based, cash-like CBDC could provide the benefits of risk-free money that can also be used for efficient electronic transactions. Unlike an account, with a token-based solution, users may opt to hold their tokens in self-custody as they do today with paper cash or coin.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

A CBDC that is designed to be cash-like, that is not account-based, and does not pay interest, should not add any new dynamics to monetary policy. With controlled circulation, it has no more impact than physical forms of cash (paper bills and coins). It may provide some new benefits from improved accounting for cash in circulation over paper and coin by providing for more real-time monitoring of flow and velocity.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Private industry stablecoin solutions may become another point of centralization in deposits and the monopolization of payments. Token payments are unlike traditional payments, where multiple networks may be affiliated with an account or debit card network. Unlike funds on a debit card, which may be accessible through multiple networks, liquidity is locked into and committed to a particular token. Network effect and scale will be prominent factors that could be used to drive competition from payments if the use of stablecoins becomes prominent in payments. A general-purpose token could be issued by the FRB as an alternative to private industry stablecoins. While it would be a direct CBDC, it would still be intermediated by banks, who would distribute it to the public like they do paper cash and coin. Similarly, the tokens will be a public good and a level playing field will exist for derivative services, including distribution, custody, and payments.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of*

*central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

A token-based CBDC may be distributed through banks. Once in circulation, like physical cash and coin, the tokens may be used with some degree of anonymity. The token format helps provide cash-like qualities, such as anonymity, the option for self-custody, and privacy. Reasonable controls can be enforced through technical solutions such as smart contracts or by rules that require some transactions to be processed by banks or service providers offering custodial wallets. For example, policy may limit the amount that may be stored in a wallet without requiring identity verification of the user. Transaction policies may be used to limit anonymous use to smaller, face-to-face transactions while large or remote transactions may require user identification and screening. Transaction information may be obfuscated to provide a reasonable degree of privacy. Under certain circumstances, by a court order for example, transaction data could be de-anonymized to assist authorities in preventing and prosecuting illicit activity.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

If the CBDC is cash-like, in the form of a token, and it is a direct CBDC, then it should be legal tender like physical cash.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

No. Paying interest on a CBDC may negatively impact deposits (Designing Central Bank Digital Currencies, IMF, January, 2020).

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

If the CBDC is a general-purpose token, if it is “cash-like,” and if it does not pay interest, then a person should be able to possess an unlimited quantity like physical cash money.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Banks should continue in their traditional role distributing cash to the public, providing custody and value-added services such as payment processing.

*18. Should a CBDC have “offline” capabilities? If so, how might that be achieved?*

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

A direct CBDC that is a general-purpose token, and meant to be cash-like, may be the optimal design. It provides many of the benefits sought by stakeholders without having some of the detrimental impacts associated with other forms. A narrowly scoped CBDC, meant to deliver improvements over the use of cash and coin, provides the most benefits with minimal detrimental impact to the financial system or the public. To assist with financial inclusion, it can provide safe, electronic transactions and store of value for people without bank accounts. Everyone else that holds and uses physical cash can also benefit from improved usability of a digital form of cash. It would be complementary to paper cash and coins. To provide a stable base for today's decentralized finance (deFI) and meet future payment innovation needs, a general-purpose token can provide a systemically safer alternative to stablecoins. Being "cash-like" may help a CBDC avoid creating unanticipated, negative impacts to the system. Individuals would most likely view a "cash-like" CBDC token as an alternative to paper cash and coin not commercial bank deposits. Other models, where individuals have a CBDC account and earn interest may compete with deposits (Designing Central Bank Digital Currencies, IMF, January, 2020).

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

FirstBank supports the points raised in the American Bankers Association's (ABA) response to the Federal Reserve Board's (Federal Reserve or Fed) Money and Payments: The U.S. Dollar in the Age of Digital Transformation discussion paper (paper). We do not plan to use our response to restate similar opinions but will reinforce certain points or add individual experience to provide context. Most notably, we do not see a compelling case for a Central Bank Digital Currency (CBDC) in the United States today. Potential benefits are uncertain while the downside risks are real. A CBDC would not be superior to alternatives that exist today. The paper proposes that a U.S. CBDC would offer digital money free from credit and liquidity risk and indicates mechanisms in place to reduce these risks are imperfect. The Federal Reserve plays a key role in ensuring the effectiveness of these mechanisms and they are working. Financial institutions are subject to stringent regulatory oversight and examination and not once has a deposit under the FDIC insurance thresholds been lost. This would indicate mechanisms are sufficient to mitigate risk appropriately, are proven, and resilient. The paper also proposes that CBDC might generate new capabilities to meet the evolving speed and efficiency requirements of the digital economy. The financial sector has been innovating to meet the needs of our digital world and consumer adoption is already strong. Since joining the Zelle P2P network, we have seen double digit growth in P2P payments every single year since 2018. We are in process of connecting to The Clearing House's Real Time Payments network and are working to connect to the FedNow network as well. The private sector and the Federal Reserve have already risen to meet speed and efficiency expectations in payments. In very recent history, we saw financial institutions support trillions of dollars in stimulus payments for businesses, consumers and families. Banks managed to set up loan programs and distribute trillions of dollars in the matter of days. This included setting up loan application platforms, designing automated systems for disbursement, adjusting to changing requirements on a dime, opening thousands of new accounts, standing up specialized call centers, and educating thousands of consumers and small business owners. FirstBank is proud to have lead the state of Colorado in the number of PPP loans distributed to customers, originating more than 20,000 loans and providing \$1.4 billion in economic relief for our communities. The paper indicates CBDC may improve the efficiency of payments associated with similar stimulus programs, but it fails to account for the back and front office ecosystem required to support them. It also assumes all intended recipients will already hold or will choose to hold accounts prior to the issuance of such stimulus. All payments have the need for balancing, managing rejections, exceptions, risk scoring or other issues which would just not have been possible in such a short time with one entity acting alone. Having a distributed financial system ensures the burden of similar programs is shared by thousands of banking institutions. It was notable that the biggest bottleneck and frustration in the PPP loan process was the inability of the SBA's systems to scale and handle the significant volume of activity associated with this program. Banks were able to be nimble, setting up loan platforms overnight. In terms of policy considerations, there are several significant economic and financial stability impacting concerns raised in the paper. However the paper does not speak to some of the basic challenges and complexities with setting up, maintaining and innovating within a new payment rail. As the Fed is acutely aware with its construction of FedNow, there is a magnitude of operational, technological, financial and procedural considerations. There will be major oversight and regulatory implications as well. Consider ACH or card payment rails where there are established and mature payment processing, operational requirements, dispute mechanisms, and consumer protections that

have been constructed over decades to where they have become reliable, resilient and trusted by consumers and retailers. All of these same elements will have to be considered if a new rail is built for CBDC.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Many of the benefits of a CBDC could better be achieved by bank issued, regulated stablecoins and we would point the Fed to the ABA comments on this subject. Additionally, the introduction of FedNow represents a significant change to existing payment rails, offering real time settlement capabilities. If tokenized payments, smart contracts or blockchain technology is required, the Federal Reserve could look to migrate its current payment rails towards these technologies versus redrawing the current two-tier banking system. Lastly, the private sector is solving nearly all of the outlined benefits of a U.S. CBDC. More innovation happens within the free market than in the government system which has significant hurdles it must cross before it can introduce new products or services. The market can absorb 'quick to fail' ideas and throw together proof of concept ideas that may or may not be successful. Government entities do not have the same luxury of failure. Consider the non-evolution of the wire system over many decades versus recent innovation in all other payment channels.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

One of the most repeated reasons for pursuing a retail model U.S. CBDC is to support financial inclusion. These proposals have focused solely on the question of access to a deposit account, which is a grossly oversimplified understanding of what it means to be financially inclusive. FirstBank has been active in financial inclusion for decades, setting up specialty banking centers to serve Asian, Latinx and Black/African American customers. These centers focus not just on deposit accounts, but on customer service in preferred languages, lending needs and financial advice. We are also proud to have stood up an innovative grant program to support home-ownership among Black and African American first time home buyers in our community. Financial institutions know their communities and their unique needs and are able to tailor products and services – not just accounts, to meet those needs. We serve customers not just digitally but with physical branches, another banking need that CBDC cannot meet. The private sector is innovating in this space more than ever and is fully equipped, committed, and better able to meet the needs of the under and underbanked than what a CBDC offers. In the 2019 FDIC study, 94.6% of households are banked – the most on record since the survey began in 2009. The study indicates banking or being underbanked is a factor of socioeconomic circumstances and does not point to a lack of products within banking ecosystem. The number one reason cited for not having a bank account is not having enough funds to meet minimum balance requirements. Given thousands of no minimum balance account options across the nation, including one at FirstBank, the solution is not "Fed wallets" but continued evaluation of broader based solutions to develop and support stronger socioeconomic health for all, particularly for people of color. It is notable the third most cited reason for being unbanked is avoiding banks provides more privacy. Given its digital nature, even with privacy as a driving tenet, this is another challenge that wouldn't be solved and in fact made worse with the development of a U.S. CBDC. We would encourage the Federal Reserve to study this factor very closely, not just for financial inclusion but for general consumer trust and likelihood of adoption. It is highly improbable there would ever be 100% adoption of any financial product or service. It bears more study to determine exactly what consumer adoption would be and given these concerns, if a CBDC will not be adopted by all, does it still provide the supposed benefits or resolve concerns of the underbanked.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

We would refer the Fed to the ABA's response, under the heading 'A CBDC is likely to balloon the Fed's balance sheet and impede the transmission of Monetary Policy'. There was an enormous amount of stimulus placed into the U.S. economy over the past two years. This stimulus was multiplied many times through fractional banking, by placing deposits within the banking system. During this time of stress, those funds were inserted back into the economy in the form of loans and investments. Last year, while navigating the pandemic both at home and work, our teams originated over 5,800 mortgage loans and more than 1,600 commercial real estate loans for a total of \$8 billion. This effort and leveraging of customer deposits ensured the pandemic remained a health crisis and did not morph into an economic crisis. Dollars were still flowing into the economy to support consumers buying homes, developing properties and all of the activity that supports a healthy and vibrant economy. Local knowledge is important to know where the biggest needs and potential impacts can be made. These decisions are best done by bankers within the communities they serve versus the

Federal Reserve in Washington D.C. The nature and business of banking creates an incentive for bankers to put money to work. Carefully and intentionally designed, the banking system is critical to the implementation of an effective monetary policy. The two are so intertwined, this factor warrants a significant amount of modeling, study and serious consideration by the Federal Reserve before determine whether or not a CBDC would help or harm its ability to carry out its mandates.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

The Federal Reserve “promotes the stability of the financial system and seeks to minimize and contain systemic risks.” The creation of a U.S. CBDC actually creates new systemic risk in several ways, many of which are outlined in the Fed’s paper. At present, one of the most acute risks to a nation is the risk of a cyber-attack that focuses on key infrastructure. With the creation of a U.S. CBDC, a central, concentrated repository of consumer funds is created. Today these funds are dispersed over the more than 9,000 banks and credit unions across the United States. A centralized source of consumer funds creates a single point of failure and incredibly high value target for nation state cyberattacks. We agree with the Fed’s comment that securing CBDC would be particularly challenging and essentially impossible in the intermediated model proposed, as the network would have thousands of entry points not under the direct control of the Fed. During times of economic uncertainty or stress, CBDC will siphon funds from the banking industry. As an example, during the first two weeks of March 2020 as things began shutting down in the United States, FirstBank saw a 14% increase in cash withdrawal activity at branches. During the week of March 15th, withdrawal activity spiked, increasing by 53% over the prior year’s average. At the same time, we fielded dozens of requests from customers asking to withdraw significant amounts, ranging up through six figure amounts. Similarly, as Russia invaded Ukraine earlier this year, we saw cash withdrawal activity spike by 26%. Coming into the bank to withdraw cash involves a certain level of friction which allows bank management to provide counsel, education, and help. With a digital public money option, no friction would exist to stop money from flowing from private banks to the Fed. This ease of “flying to safety” could turn moments of uncertainty spiraling into significant deposit outflows from banks, impacting their ability to lend and invest through challenging times.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

We support the ABA response on how a CBDC would adversely affect the financial sector and would emphasize the following points: – A CBDC undermines the important role banks play in financial intermediation and would impact consumers and small businesses in the form of reduced credit availability and increased cost – Attempts to limit deposit outflows by capping account size are not sufficient to mitigate the adverse impact, creates an uneven impact to community banks like ours, and will create logistical challenges that will be very difficult to manage In an attempt to quantify the potential impact a CBDC could have on bank deposits, the following is an outline of our consumer transaction deposits at risk at varying CBDC limit amounts. – If CBDC “accounts” were limited to less than \$1,000, just under 60% of consumer transaction accounts could be at risk for a total of \$455 Million in deposits. – At limits of less than \$5,000 the number of accounts at risk increases to 77% and deposits at risk jump to \$952 Million. – At limits of less than \$10,000, 85% of accounts are at risk for a total of \$1.329 Billion.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

We are not aware of any tools sufficient to mitigate the adverse impact a U.S. CBDC would have on the financial sector.

*8. If cash usage declines, is it important to preserve the general public’s access to a form of central bank money that can be used widely for payments?*

The Fed’s paper indicates a CBDC would be in addition to, not a substitute for central bank money in circulation today. Cash is still a consumer option and there is not a need for a digital substitute. A decline in usage of cash will remain the consumer’s choice. Consumers are choosing to make digital payments, using private versus central bank money and are opting out of cash transactions. There are sufficient digital options for payments today, flowing through the system in a safe and sound manner, without recreating digital public money.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

There is considerable evolution in the cross-border and digital payment landscape happening today through both public and private sector innovation. The development of person to person payments, same day ACH, and creation of the Real Time Payment and FedNow networks are just a handful of examples. Card networks offer ubiquity across borders today and can be used to make payments that are seamless from the consumer point of view. There are significant assumptions built into the perceived potential of CBDC to improve cross-border payments, some of which the Fed outlines in its paper. First, an improved process assumes other countries will either hold U.S. CBDC themselves, in order to achieve the efficiencies with settlement CBDC could provide; or, it assumes that all CBDCs are interoperable. As the paper outlines, interoperability would require significant international coordination to create standards and infrastructure and would still require some sort of foreign exchange or conversion in order to be utilized outside the United States. Finally, the use of stablecoins or other digital assets represents a significant development in cross border payment capabilities, as evidenced by recent donations to Ukrainian citizens. Unless these same citizens individually held U.S. CBDC, or U.S. CBDC was interoperable with their country's CBDC (assumes the country has one), this type of activity or support would not be feasible. This also assumes individuals can trust their country's governance of their CBDC; this will not be possible for persecuted persons or those fleeing situations of genocide, for example. U.S. Dollar tethered stablecoins provide significant cross border payment capabilities today, and if brought into a safe and sound banking system, can provide benefits beyond what a U.S. CBDC may offer.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

We do not feel a U.S. CBDC is required to support the Dollar's international role and support the ABA's response to this question. As quoted, "The dollar's status as the world's most widely used currency for payments... fundamentally stems from the overall size of the U.S. global economic presence, our open financial markets, their deep financial liquidity, widespread international trust in U.S. public and private institutions, and the U.S. commitment to the rule of law. ...Other countries' use of non-dollar CBDCs will not automatically duplicate any of these key factors." The strength and position of the Dollar's international role is further proven by its dominance in the digital asset market that already exists today. U.S. Dollar tethered stablecoins constitute roughly 98% of all stablecoin volume, according to CoinGecko. The fact that the DeFi market has flocked to U.S. Dollar denominated digital assets to support trades and activity points to the U.S. dominance in even non-traditional financial markets.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

There is an inherent tension between privacy and preserving national security or preventing financial crimes, which has not been resolved today and not likely to be solved by the creation of a U.S. CBDC. This tension would likely increase and tilt in one way or another, with the creation of digital dollars. Today, not even central bank money, or cash, is completely anonymous if you factor in FINCEN reporting requirements for certain cash transactions.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

As stated earlier in the response, a centralized source of consumer funds held at the Fed, creates a single point of failure and incredibly high value target for nation state cyberattacks. We agree with the Fed's comment that securing CBDC would be particularly challenging in the intermediated model proposed. In order for there to be operational resiliency, the Fed could look to its current systems and those of the greater payments ecosystem. Even with countless data centers and redundancy in all forms and functions, not even the Fed's network or card networks are ever completely failproof as evidenced by outages over the last few years.

*14. Should a CBDC be legal tender?*

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

The determination whether or not to pay interest should come after the Fed has determined a viable reason or use case for a consumer CBDC. It is a layer of uncertainty on an undetermined amount of risk to financial system stability. It would exacerbate the movement of money into CBDC during times of economic stress and make the Fed a super advantaged competitor to banks. There are other implications and questions to answer such as where do these interest payments come from and what would that mean to the overall model and financial system. This item in itself bears significant study, but should come after the Fed determines exactly what problem a CBDC is working to solve.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Quantity limits are not sufficient to mitigate the risk that the creation of a U.S. CBDC presents to the financial system.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

We feel very strongly that the baseline for acting as an intermediary for CBDC must require oversight and supervision at least equal to the oversight of chartered financial institutions. An institution that is linked to central bank currency must be subject to comprehensive examination, particularly for adherence with anti-money laundering compliance, cyber security review and operational soundness. Especially in times of stress, it is critical for the Fed to be able to work with and trust institutions, relying on their resiliency and well capitalized structures. When 9/11 grounded flights transporting stacks of paper checks and cash letters, the Fed floated money to financial institutions, knowing their capital back stops would prevent any major issues to these payment advances. The money transmitter patchwork was not meant for the global nature of the payment systems that have evolved today. Requirements are different across state lines and oversight, attention and knowledge varies greatly. A well organized, safe and sound payment system requires the consistent and time-tested oversight framework that exists today. The Federal Reserve should very carefully consider the addition of any non-financial institutions in a CBDC ecosystem. Incentives for non-bank intermediaries to participate in this space should be closely examined. Banks have a natural incentive to gather deposits and serve a customer's financial needs. Why would a non-bank intermediary want to provide KYC and other anti-money laundering services for those using CBDC? A logical assumption is the access to powerful consumer data. There is arguably no information more valuable to a large tech company than the information contained within a consumer's financial transactions.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

It is often suggested that a CBDC can be a means to expand financial inclusion, particularly by creating individual retail accounts at the Federal Reserve. Professor Howell Jackson of Harvard Law School and I believe that the Treasury Department could, relatively quickly, create digital accounts to provide payment services that would be especially valuable to unbanked and underbanked individuals. These accounts might not possess all the technological advances of a full-blown CBDC, but they would be much easier to establish and could be implemented now under existing statutory authority. Treasury Accounts could immediately improve access to financial services for the millions of Americans who have limited access to banking services today and also greatly facilitate the distribution of federal benefit programs to all Americans. Treasury Accounts are not an alternative to CBDCs but rather a faster, easier way to achieve some of the primary objectives of those who favor creating a CBDC. It is likely to be years before we have a CBDC, if we decide to create one. The financial inclusion need, however, is urgent and should be addressed today. Moreover, implementing Treasury Accounts could generate useful insights and information that might later be incorporated into any CBDC that the nation eventually decides to adopt. We have explored in greater detail our Treasury Accounts proposal in a recent paper published by Brookings which can be found at this link:

<https://www.brookings.edu/research/the-treasury-option-how-the-us-can-achieve-the-financial-inclusion-benefits-of-a-cbdc-now/>

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*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement*

*monetary policy in the pursuit of its maximum-employment and price-stability goals?*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

It is with pleasure to provide commentary to your research/analysis paper titled “Money and Payments: The U.S. Dollar in the Age of Digital Transformation” (the “FedPaper”) in January 2022. I am a full-professor and a Connaught Scholar at the University of Toronto (Dept. of Electrical and Computer Engineering, cross-appointed with Dept. of Computer Science). I obtained my PhD from the University of Illinois, Urbana-Champaign in 1998. I have been working in the area Central Bank Digital Currencies (CBDCs) since 2016. In 2020-21 I was the lead co-author for an invited report by the Bank of Canada for a candidate techno-legal and economic architecture for the Canadian Central Bank Digital Loonie (CBDL)[1]. In 2021-22 I was honored to be acknowledged for my comments on the report by the Hoover Institution, edited by Darrell Duffie & Elizabeth Economy and titled “Digital Currencies: The US, China, And The World At A Crossroads” [2]. I have been working in blockchain technology since 2011. In closing of this brief introduction, it is a wish that you find the comments below both constructive and helpful to the quest of the Federal Reserve System for an e-USD. Let me first set a definition of a retail or general purpose CBDC and outline the norms that an e-USD should adhere to based on majority consensus by prior literature on same. Respectfully, the definition below is neither “absolute” nor an “opinion” but by necessity so to set an axiomatic foundation/framework that places the questions/answers herein within a focused context. Commonly CBDCs have been described as an “alternative to fiat cash” or “e-money with cash characteristics.” Therefore, if this is indeed the case, CBDCs seem to necessitate the following physical-cash characteristics: (i) they are a liability on the Central Bank’s (CB’s) balance sheet, (where for the case of the Fed each e-USD is equivalent to one US dollar); (ii) they are available to every registered US residents, businesses, non-profits, tourists to the US, etc. (iii) they transfer quasi-anonymously among verified e-wallets that require KYC; (iv) they transfer in real-time with minimum cost-recovery fees; (v) they allow offline transactions; (vi) they generate seigniorage income for the Fed at creation; and (vii) they comply with AML/CFT regulations. More on property (iii): CBDCs (and their respective transactions & associated data-flows) should have the same strong anonymity characteristics as fiat cash which is virtually anonymous. Later, I make the argument that there is a trade-off to this anonymity as one tries to balance the consumer/merchant interest against AML/CFT law. This trade off also spills into an effort to advance the public interest in terms of an environment of payment modernization that fosters “fair play” competition, innovation in this new digital economy, and social welfare. Clause (iv) is necessary because transaction processing for CB money itself is a commodity, not a valued-added service. Historically, cash has been a public’s “common government resource,” (i.e. a “public good”) and therefore its processing should be provided to the public at (or close to) zero-cost. This is actually the case with the Fedwire system today that charges minuscule fees to the participating institutions. However, those nominal system-use costs they do not resonate to the public that continues to pay excessive fees for e-payments. At the same time, today the public also gives out its personal data to the various service providers without getting compensated for it (more on this later), notwithstanding that existing payment systems cannot scale to serve the citizens to compete in this new IoT/5G+ “smart (micro-payment) economies”. Finally, claim (v) is necessary for public inclusion & social welfare to the un/under-banked, but to also provide accessibility to areas with no network coverage. Under this axiomatic foundation, a CBDC \*should not\* offer interest, just as physical cash today (i.e., paper money inside one’s wallet) does not provide interest either. Of course, I recognize that whether an e-USD will bear interest or not is a policy decision. However, as I address the questions herein, I make the underlying assumption (that stems from the definition above) that an e-USD does not offer

interest. This also allows one to focus as the introduction of interest-bearing CBDCs complicates matters/policies exponentially. Later in this document I make the argument that CBDC interest can be “emulated” with “safe helicopter e-money.” Lastly, there is a good argument to be made that the introduction of an interest-bearing e-USD will encounter fierce opposition (and probably rightfully so) by the private banking sector and other payment service providers (PSMs). This opposition can risk its introduction and diminish its benefits to social welfare. I continue Question#1 in the space provided for Question #4 (apologies for this)

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

A CBDC has a narrow scope, a holistic view and a tight definition, and it would be hard to imagine that its impact & architecture can be replicated by simply “patching” legacy components with a few new ones. The development and deployment of a CBDCs is not a complex technological problem. As a point of reference, it took Ethereum (a Turing-complete decentralized smart-money engine) just two years to build it. At the time, it was a first mover and there was little prior knowledge on how to establish a new network. To date it has proven to be remarkably resilient towards cyberattacks. Of course, a CB is unlikely to be built a permissionless (blockchain) system as its CBDC, but at the same time, one should not expect a CBDC implementation to take much longer. Instead, the main obstacles today seem to be the (lack of) political will and regulatory conservatism (or “regulatory obsolescence” for lack of better terms). History shows that a “design by committee” will introduce frictions and delays that may regrettably risk a CBDCs social benefits and ambiguise its original goals. For instance, in the case of the Danske Bank’s MobilePay a “design by committee” approach was originally followed but this forced the bank to discontinue this partnership and complete it “stand-alone”. Although this is a case of a private bank, the example already shows the difficulties when many parties with conflicting interests are trying to design an innovative payment system together. In contrast, a recent success story by a CB is Brazil’s PIX payment system that was implemented solely by the Central Bank of Brazil and took less than two years to bring it to life. In this process, the Central Bank of Brazil mandated via regulation the participation of the private sector so to increase its network effects. Following its release, it took just over a year to capture more than 67% of the adult population (see: “Central banks, the monetary system and public payment infrastructures: lessons from Brazil’s Pix,” BIS Bulletin #52, March 2022). In contrast, here in Canada, it took more than 6 years to bring to life the new, designed-by-committee, Lynx High-Value Payment System. The reader is also encouraged to browse the discussion of Sections 7.1-7.4 and 9 in [1] that further argues about the points raised in this paragraph. Following the above thinking, it would respectfully seem a mistake if the FedNow system is advertised as an “interim” USD-CBDC alternative, as recent rumors seem to indicate. There also a good argument to be made that there may be severe domestic and international risks for the US if a proper e-USD is not introduced in a timely & proper fashion. First, the FedNow system is a payment rail system, and it is not a CBDC. Of course, historically, wholesale payment systems have been used to also support/settle retail transactions but strictly speaking, FedNow was never designed to replicate the functionality of a CBDC. Further, it cannot support micro-transactions that serve an IoT economy, it does not introduce provisions to protect user’s data (that will be left to private parties to harvest them as it regrettably happens today impoverishing the foundations of healthy competition against oligopolies), it cannot create novel data-trading economies unless a private layer-2 system is built on-top -- which loops back to the private sector to elevate the dollar into “programmable smart money”, a risky expedition when it comes to standardization/compatibility with foreign “true CBDC” systems, and to data protection metrics.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

There is extensive literature where most CBs agree that the introduction of CBDCs can have a major impact on financial inclusion to core national activities, social welfare, and innovation/entrepreneurship --- if they are implemented properly. Their offline functionality will also allow them to reach people who don’t have access to traditional banking means, or those in remote communities. For the US it has been reported that there is as much as 15% of the population that it is unbanked and another 15% that is under-banked. As a result of this, these people usually also lack access to credit which limits their ability to improve their financial well-being, which in turn promotes the health of an economy. Although a CBDC system does not offer credit, a healthy ecosystem around it should be able to help this population improve their opportunities to eventually have access to it. For instance, an e-USD should lower costs for citizens who have no bank accounts, and today they have to resolve to very expensive means/fees to cash their paychecks and/or stimulus-checks. As another example, an e-USD should provide new and convenient means for this population to access the new digital economy and hopefully help them innovate in cost-effective ways. In closing,

clearly existing payment systems lack the flexibility to adapt to the digitization of the economy and they often imperil social welfare for those who don't have alternate means. They remain slow, clunky, and expensive; often one receives a digital service, or even physical goods, faster than the merchant receives the payment. They also do not allow for B2B, B2C and C2C innovation as the oligopolies driving them have little appetite to allow new entrants in fear of cannibalizing their existing cash-cow revenue streams. An objective observer will comment that this is no different to the introduction of cell phones in the US during the 1990s where legacy landline revenue streams delayed the modernization of the infrastructure to this of a mass-scale wireless transmission. As such, wireless phone adoption lagged when compared to Europe and Asia, or even under-developed economies (e.g., Africa). Further, the emergence of Decentralized Finance (DeFi) has already demonstrated a capacity to disrupt the financial sector where digital fractional tokenization makes expensive assets today to become approachable "to all". Hence, a properly designed e-USD has a major potential to impact financial inclusion and social welfare, and it is worth every second of the political will one needs to exercise for it to bring it into reality.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

This is the second (continuation) answering Question #1: Clause (iv) is necessary because transaction processing for CB money itself is a commodity, not a valued-added service. Historically, cash has been a public's "common government resource," (i.e. a "public good") and therefore its processing should be provided to the public at (or close to) zero-cost. This is actually the case with the Fedwire system today that charges minuscule fees to the participating institutions. However, those nominal system-use costs they do not resonate to the public that continues to pay excessive fees for e-payments. At the same time, today the public also gives out its personal data to the various service providers without getting compensated for it (more on this later), notwithstanding that existing payment systems cannot scale to serve the citizens to compete in this new IoT/5G+ "smart (micro-payment) economies". Finally, claim (v) is necessary for public inclusion & social welfare to the un/under-banked, but to also provide accessibility to areas with no network coverage. Under this axiomatic foundation, a CBDC \*should not\* offer interest, just as physical cash today (i.e., paper money inside one's wallet) does not provide interest either. Of course, I recognize that whether an e-USD will bear interest or not is a policy decision. However, as I address the questions herein, I make the underlying assumption (that stems from the definition above) that an e-USD does not offer interest. This also allows one to focus as the introduction of interest-bearing CBDCs complicates matters/policies exponentially. Later in this document I make the argument that CBDC interest can be "emulated" with "safe helicopter e-money." Lastly, there is a good argument to be made that the introduction of an interest-bearing e-USD will encounter fierce opposition (and probably rightfully so) by the private banking sector and other payment service providers (PSMs). This opposition can risk its introduction and diminish its benefits to social welfare. Now on the particulars behind question #1: the FedPaper is rather comprehensive on the benefits, policy considerations and risks behind the e-USD. However, I take the following exceptions that need clarification and more well-defined guidance by the Fed: a) In my view, unless I missed something, the FedPaper's definition of "intermediated CBDC" (Page 13) reads a bit confusingly. Namely, it seems to dilute the original definition (by the IMF and others) into the much narrower view of what is actually defined as a "synthetic CBDC". In more detail, an "intermediated CBDC" (or a hybrid, or a two-tiered one, with all those terms being equivalent) as set by the IMF and most other literature, is one where the user holds a direct claim to the CB, and it is only its distribution and transaction processing that are handled by private actors. Additionally, this literature sets a "synthetic CBDC" as one where the direct claim of the user is to the private entity that holds their account, and not to the CB. Essentially a "synthetic CBDC" resembles existing cryptocurrency stablecoins where the user has claims for the asset to the said private sector entity and not on the CB. It is also not a secret that this model is not favored by most G20 CBs when they consider the architecture behind their CBDC. In closing, although the Federal Reserve Act does not currently authorize direct Federal Reserve accounts for individuals, amendments to the Act will be necessary to introduce the digital dollar anyways, and this hurdle can be changed. Even without major amendments, one could introduce a Narrow Bank fully controlled (and owned) by the Fed in a similar way as we propose in the CBDL report for the Bank of Canada [1]. In future releases, the Fed may want to expand on those points. b) What is starkly missing from the FedPaper is a thorough analysis of the ownership, harvesting and protection of (citizen's, SMEs', etc.) data and of the respective data flows. A CBDC is a system-critical technology that hundreds of millions of people will be using daily, generating an enormous amount of payments data annotated with sensitive public information not available today in existing payments systems. Citizens have a right to privacy but to also monetize their data, businesses have a right to secrecy – how are these privacy/secrecy rights protected, what thresholds are introduced and why/how are they protected while they respect AML/CFT laws? As the March 9, 2022 Digital Asset Executive Order by US President

Biden also implies, it is the role of the government to mitigate those risks associated with the introduction of such a system. Protection of this data on a national scale should promote financial inclusion and “fair play” by the private sector, but also safeguard socioeconomic sovereignty for the United States internationally in this new IoT/5G+ “borderless” digital era.

Question #1 continues at Question #11 ...

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

A recent recurring theme is that CBDCs hold a high risk to financial stability. We recognize that any new form of e-payment can be perceived as competition to existing payment channels by the incumbents, unless private FIs start running this system from the very first day. As argued earlier, this latter practice raises a plethora of concerns that bring the success of an e-USD into grave risks. In fact, any argument that asserts that a CBDC e-USD system changes the “competitive banking landscape” dramatically would implicitly need to assume that commoditized payments allow for “bank rents”. In our highly competitive banking world, that is unlikely. The processing of payments by FIs today is arguably only a small portion of their payments value chain. The most critical (and lucrative) service that commercial banks provide is liquidity to the market through credit arrangements (e.g., credit cards, overdraft arrangements on chequing accounts, and lines of credits, etc.). Evidently, merchants and customers benefit from this value-added service because credit enables purchases even if they do not have the necessary funds at the time of the payment. Merchants who refuse credits cards in favour of the e-USD, for instance, would most likely lose customers. Further, e-USD wallets can be capped to small amounts (e.g., \$10,000) no different to what happens today where we should not expect one to hold more than a handful of paper bills in his wallet or at her home. Functionally, when the cap is exceeded, the funds could also flow into a link account at the user’s commercial bank. Instead, the introduction of an e-USD and its underlying appropriate bare-bone payment rail ecosystem with appropriate APIs, for the private sector to be able to use and build-upon, promises to grow the economy into this “new digital age” and promote healthy competition. In fact, the FedPaper admits that in recent years mobile payments innovation made the digital economy faster and more convenient, and it is indeed the shift away from CB money that may cause financial instability (Page 3). Hence, as novel private fintech payment initiatives by Apple, Google, Paypal, Coinbase, etc. did not disrupt the existing banking system with their emergence, so why an e-USD could provide such negative network effects? In closing, I encourage the reader to review the recer work in [3] where the author makes an educated point on why a CBDC/e-USD promotes a spectrum of innovation, fair competition and it is expected to pose no tangible risk(s) to the existing banking industry. [3] D. Duffie, “Payment system disruption: Digital currencies and bank-railed payment innovation,” in Technology and Finance, CEPR/IESE Banking Initiative (to appear)

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Please see answer to Question #5. When it comes to stablecoins, a CBDC is a direct liability of a CB to the citizen. Clearly, this is divergent to role and mechanics of a stablecoin. Additionally, there is a myriad of other differences to their operation, technical implementation, regulation, and cross-border use, etc. There is little to argue against the fact that the emergence of stablecoins (and the associated DeFi) created an excitement for fintech last seen during the 1990s adoption of the internet. However, it is directionally wrong, and most likely wrong by orders of magnitude, to contemplate that a stablecoin can replace the benefits of a CBDC as their scope, motives, regulatory frameworks and public guarantees are fundamentally/radically different.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

The most obvious tool, as also observed by the introduction of the e-CNY by the PBC, or the Bahamian Sand Dollar, is to limit the amount of e-cash an online and offline wallet can hold and/or transact.

*8. If cash usage declines, is it important to preserve the general public’s access to a form of central bank money that can be used widely for payments?*

One of the historic core premises of a CB is to provide fiat currency to the public but also ensure rails where/how this currency can transfer to promote economic growth with social benefits. Evidently, the concept and usage of money has evolved during history, and today the use of physical cash declines at the dawn of the digital world. In a nutshell, what we experience is another (and most likely “a quite dramatic”) turning point that puzzles the very

essence and use of “cash”. Therefore, the need remains imperative for CBs to continue to provide the public with “safe” CB money but also ensure that all their benefits & safeguards are available to their citizens in a fair manner by the associated payment rails for this modernized form of money.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

When it comes to domestic payments, in the absence of an e-USD one should expect innovation to be driven by private banks and other private fintech payment providers while cash-usage will continue to decline. Although those incumbents usually innovate fast, if history acts as guidance, it is realistic to assume that payments will remain expensive while the associated data will remain siloed – sometimes by foreign entities, which is a rather scary proposition for a dominant global power such as the US is. Admittedly, this can place the US national sovereignty at risk. One should also expect that the leading players will continue to inhibit entrance/innovation to new entrants, while the standardization of this programmable money will remain a challenge (for instance, today an Apple Pay wallet does not work on a Google Android smartphone). When it comes to cross-border payments, one should expect existing/forthcoming “dominating” CBDC systems to make inroads in both global standardization and payment rail-services to under-developed or emerging economies (predominantly in SAE, Africa and LatAm). The lack of an e-USD will also foster more adoption of cryptocurrencies as a cross-border payment medium, including stablecoins that are no longer fully-pegged to the USD but to other currencies (i.e., EUR, RMB, SDR). Long term this is expected to impact the US economy (and its global political influence) negatively, with a good probability to affect the role of the US dollar as a currency reserve but also this of SWIFT as a political US weapon. Further, one should not expect that private US corporations will create the same inroads in capturing a payment audience in foreign countries (e.g., the Facebook/WhatsApp recent struggles in Brazil and India). We refer the reader to [2] for a more extensive talk on this topic.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

With the emergence of globalization and cross-border digitization, the past few decades created a more tightly connected world. Therefore, as the follow-up from recent “weaponization of SWIFT” during the Ukraine invasion clearly indicated (where Russia started to build new channels for cross-border payments with China, Saudi Arabia etc), the world is intertwined more than at any other time in history indicating that nothing can be taken as politically granted. No difference to the cold war, decisions by other large economies should influence the US in issuing its own e-USD so to maintain its global influence and currency reserve status.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

This is the third and last part answering Question #1, again apologies for this: This does not necessarily mean that the Fed also becomes the “central repository” of all this data, but it may be the case in this new digital economy for a CB to become the “safeguarding agent” of people’s data but also the gateway (i.e., payment rail) that people can trust to monetize their data via third-party private intermediaries. Case in point here are the lessons learned in the past two decades by this new “private free economy” of digital leisure and material abundance, where every device and human entity are subsumed in a centralized IoT/web network. Notably, in the United States but also in many other jurisdictions (e.g., China, see [2]), this economy is oligopolistically directed by just a handful of private corporations. This threatens to damage the social fabric as it has been historically shaped, and it presents novel challenges to the citizen and nation’s sovereignty. In particular, services in this new digital economy are rarely “free,” as is often advertised, but the public pays with their time and data, and by severely compromising their privacy. In other words, in our modern world the time to generate this data, but also the data itself, is a new form of “money.” As such, there’s a fair argument to be made that this “free economy” banishes what we historically has been the very essence of “CB citizen money” -- traditionally, this money requires time (e.g., work) by the public to gain it (e.g., salary, revenue, etc) but also endows its owners with reciprocal control of their own time/data. Hence, much emphasis should be given by the Fed in the creation of an e-USD associated by an ecosystem with functionalities that allow people, SMEs, etc to “own” their own data but also provides new safe avenues to them to monetize it in “fair ways”. After all, it is not a coincidence that the introduction of e-CNY in China was in large part a counter-act to contain modern payment systems (Alibaba and Tencent) that dominated the markets by developing an exclusive view on citizen’s (and even government’s) payments data flows, to the detriment of national policies [2]. Just like in other historic

monopolies and/or oligopolies, it is the role of the government to protect the citizens and it is therefore desirable for the next FedPaper iteration to give more clarity on how the e-USD safeguards social welfare, competition, and data protection/ownership. c) Finally, I kindly recommend that in future publications that you consider including rigorous guidance on the “programmability” of the e-USD. In this manner, the reader will be able to attain a holistic view of the ecosystem. In its current incarnation, the suggested narrative by the FedPaper does not make a convincing case that it is functionally superior to the already “emerging/evolving world” of a fast(er) retail payment networks based on traditional payment standards. As it stands, the key innovation behind an e-USD today seems to be the issuance of a Central Bank-backed private-institutional-driven fiat-denominated USD-stablecoin on an institutionally-only-accessed network. Unless it has broader functionality that transcends a walled off system, it is difficult to see why such new money is needed or what is the major innovation. Instead, there is a remarkable opportunity to establish a CBDC network as a novel “common resource” for next-generation value transfers via CBDCs (i.e., their denominated assets) as the backbone component of this new system. When this is viewed in cross-border commerce, it adds to the prospects of the USD global dominance. [1] A. Veneris, A. Park, F. Long and P. Puri, “Central Bank Digital Loonie: Canadian Cash for a New Global Economy”, February 2021 [2] <https://www.hoover.org/research/digital-currencies-us-china-and-world-crossroads>

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

User privacy has been of paramount importance as a recent survey by the ECB reported following a 4-month poll of the EU citizens (see: “Eurosystem report on the public consultation on a digital euro, ECB, April 2021). Thankfully, cryptographic “privacy enhancing” primitives, more notably homomorphic cryptography along with mixers/tumblers, allows a CBDC to maintain the desired balance between the obligations to its citizens for their data privacy/ownership/fair-monetization, but also the mandate for their regulatory compliance with AML/CFT/KYC law. The reader is invited to browse the work in [4] that provides a comprehensive set of considerations, interplays, and trade-offs between user privacy and AML/CFT for CBDCs. For the sake of brevity, this discussion will not be repeated here but in summary it heeds regulation-by-design as a core CBDC methodological foundation, with Privacy-Enhancing Technologies as the relevant use case, where privacy and regulatory compliance do not need to form a zero-sum game. Finally, the introduction of an e-USD and its underlying user protection also provides the US a unique opportunity to cement its historic role in human/societal freedom & rights at a global level. [4] N. Pocher and A. Veneris, “Privacy and Transparency in CBDCs: A Regulation-by-Design AML/CFT Scheme,” in IEEE Transactions on Network and Service Management, 2021

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

Yes, an e-USD is legal tender by definition (Question #1).

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

This is a multi-faceted question with an overwhelming set of complex implications to the design, functionality, economics, and social impact of a CBDC. I also respectfully submit that this question goes far beyond the scope of a questionnaire about a CBDC as it touches said monetary and fiscal policies. However, most CBs feel reluctant to design a CBDC that offers interest [3], as also rationalized in the commentary of Question #1. Especially in an environment like the US, an interest bearing CBDC will encounter significant resistance, and probably rightfully so, by the private banks and other FIs. However, at any given time the Fed can always decide to deposit e-USDs to the citizen’s wallets (i.e., even proportionally to the historic balances of the said wallets). Although an oversimplification, this type of elastic “helicopter e-money” can emulate & stimulate similar monetary policy effects to this of a recurring interest, without the political and public shortcomings of the latter.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Yes, as noted in various placed earlier.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

It depends on the AML/CFT process, whether it is a traditional centralized Web 2.0 one, or it is Web 3.0 decentralized one where users hold their keys, and their identity/reputation is sourced/validated by multiple parties. Or it can just be a mix of both. The latter 3.0 case does not really need intermediaries, but it does need validators and reputation metrics. In all cases, a selected number of entities (DMV, SSA, IRS, major FIs and telcos) with a long-standing experience in KYC/AML/CFT duties should only be involved in this process.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

The work of [1] contains an extensive commentary on an offline-CBDC hardware implementation. The report of [2] contains detailed references to the offline characteristics & existing background literature behind the offline e-CNY which is already in circulation. A CBDC should have offline capabilities as one should not expect to have network coverage all around the US and further, offline CBDCs promote financial inclusion, as noted earlier. All in all, offline CBDCs pose a trade-off between security and cost of the implementation [2]. No matter the final decision where to draw the line when deciding those trade-offs, the "arm of law" seems also always necessary as a last resort to prevent fraud – no different to what happens with physical cash today.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes, and this is another reason that the Fed must handle the design of the e-USD stand-alone, so to also ensure uniform/universal standardization of the system with proper APIs to external parties (private/public sectors), as noted earlier. We refer the reader to [1] that contains more details in this process and draws analogies to India's Aadhar/UPI system that has successfully served more than 700M citizens by opening their APIs to third parties. The Brazilian PIX also followed a similar approach that so far proved quite successful if we are to judge by adoption. As we also noted earlier, historically the private sector has proved quite articulate to design easy-to-use solutions but at the same time it has not proved efficient to promote standardization. In fact, when it comes to digitization "closed/proprietary siloed systems" (e.g., Apple, semiconductor design industry) remain often the norm.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Once should expect that advances in quantum computation will pose major challenges to anything encrypted electronically by "Newtonian mechanics" and this certainly includes a CBDC. To that end, the FED should be proactive by considering quantum-resistant cryptographic protocols, which is a field that the US has supreme technology expertise and advantage at an international scale.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Please see the three bullets in Question #1 on data protection/monetization/ownership and CBDC programmability. These are important aspects of a CBDCs design that are starkly missing in the current configuration of FedPaper's thinking. Another one not noted above is the \*timing\* for the e-USD. The e-CNY is already a reality (projected to penetrate markets outside of China and contrary to the official government rhetoric [2]). Just three days before the FedPaper's May 20, 2022 deadline to submit those comments , ECB's Fabio Panetta announced that the e-EUR should be expected by 2026 at the latest. Respectfully, the evolution of digital & fintech technology offers domestic and international US monetary policy two choices: (1) disregard, attempt to regulate with "analog" laws, and contain it to maintain the status quo, or (2) understand its intricacies and adapt existing practices. At least publicly, the Fed seems to lag in technical/economic/regulatory R&D for the e-USD. Looking back at market charts of the complacent 1990s music industry in the past 22 years when P2P streaming was first introduced (and the traditional music industry started to sue "ghosts on the internet" so to protect their dominance instead of finding ways to use this new technology to grow their business) it indeed confirms that mishandling digital innovation backfires. Only those who adapt to the digital opportunity with swift & robust decisions lead those new opportunities [5]. [5] International Federation of the Phonographic Industry. Global Music Report, <http://www.ifpi.org/downloads/GMR2017.pdf>, 2017.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

While adoption of digital payments in the US has been significant, as consumer cash transactions have decreased from 31% of all payments in 2017 to 20% of all payments in 2021 (2022 Findings from the Diary of Consumer Payment Choice, Federal Reserve Board of San Francisco), the share of cash by age group has actually rebounded among 25-34 year olds and 45-64 year olds. For multiple reasons, consumers may or may not adopt a new form of cash such as a CBDC. From the same "Diary of Consumer Payment Choice," person-to-person payments reflect an increase in mobile apps—largely due to the COVID pandemic—however cash use still remains at nearly 50% of market share of payment use. While mobile use has moved from 11% share of in-person payments in 2019 to 29% in 2021, cash still reflects a plurality of market share of payments. The byproduct of this implies a consumer demand for cash for the foreseeable future. As a result, we raise the question of consumer-CBDC adoption/penetration, particularly as it relates to digital payment literacy. Research by Prete (2022) suggests market access to a payment technology such as CBDC may yield substantive consumer risk if digital literacy skills do not align with financial literacy skills. As well, any CBDC should be established with a neutrality mandate, making the CBDC completely neutral for consumers, regardless of the political parties in power at federal and state levels. Such a mandate should not overstep Article 1, Section 8, Clause 5 of the U.S. Constitution, but insofar as the widespread consumer and commercial use of currency, neutrality needs to ensure that its functionality and access is not at the behest of whomever is in political power. Regardless, the normative interest in CBDC—especially as a flight to safety from other currency assets such as cryptocurrencies—may necessitate its development. In contrast with cryptocurrencies, however, a CBDC serves a different function as a store of value, medium of exchange, and unit of account. Therefore, CBDC should be an M0 e-money complement to cash, not an alternative cryptocurrency.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Given the issues outlined in the Federal Reserve white paper, it does not seem as though the benefits could be achieved differently. The US dollar not only is competing with other countries—of whom many are proposing, if not implementing CBDCs—it is also “competing” with other cryptocurrencies, such as stablecoins as both stores of value and mediums of exchange. Nonetheless, cryptocurrencies serve a different purpose, as their value is not determined by a central bank, but instead by Proof of Work. Prasad (2021) writes that a digital currency has three key features: it is immutable, it is valid, and it is verified. It is difficult to think these features in a CBDC would be achieved in a way that has otherwise not been considered. While most of American consumers already use digitalized forms of money, these alternate forms of money do not necessarily provide the same benefits (such as transaction speed and payment clearing) as would a CBDC. As well, a CBDC would coincide with generational shifts toward digitalized money and P2P payments—perhaps indicating a long-term transitioning away from physical cash. This would maintain the stability of a fiat currency in digital form. As there is mutual international escalation over CBDC proposals, pilots, and rollouts (e.g., e-CNY, e-krona, e-euro), a CBDC is necessary for the US dollar to remain globally competitive and innovative in the fintech space.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Financial inclusion would be net neutral, but this largely depends on the infrastructure used to access and transact in CBDC. For example, informal transactions in the shadow economy (e.g., panhandling, street performing, kid's lemonade stand) may face difficulty if they do not have access to technologies that can use or accept a CBDC as a medium of exchange. While this may bring some revenues back into the traditional economy and increase tax base, this may decrease identification that Torgler, Schneider, and Schaltegger (2010) finds improves tax morale. A CBDC could also reduce cash burdens in areas where retail banking is more difficult to access, however this would also depend on reliable, high-speed network infrastructure for digital currency to be effective. Work that I have co-authored (Journal of Consumer Affairs, forthcoming) on platformed money ecosystems suggests that the structure of— and access to— a CBDC is extremely relevant to unbanked and underbanked individuals who largely pay for goods and services using cash. If we begin with the premise (as I am) that a CBDC should function as a blockchain-based version of digital M0 cash, then access to it is important for equity and inclusion.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

At this moment, we are currently seeing the collapse of the Terra blockchain and Terracoin, which rely on permissionless community consensus. A CBDC operating like fiat currency, should instead use permission-based blockchain (Zhang and Huang 2021), relying on the full faith and credit of the United States government as its mediator of value. A permission-based blockchain would also allow for increased scalability and system interoperability, while retaining monetary policy authority over the money supply.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes, not the least in the near-term, as a plurality of consumers still use cash as a primary medium of transacting. A colleague and I are currently working on a research paper in the Swedish context that involves consumer interest in preserving access to cash. Our pending findings suggest multiple reasons for the interest in preserving access to cash— even from those consumers who use cashless payments on a regular basis. Given such currency is from the central bank (whose monetary policy is mandated by the U.S. government and, therefore taxpayers), there is a stake at hand for a medium of exchange that is backed by a government's faith and credit, is secure, and is universally accepted as a store of value. As well, another paper I am working on looks at the negative impact of a cashless economy on alternative market economies (shadow markets) such as buskers, homeless folks, and street-based charities. The results of this work finds that the personal gains found in altruistic behaviors generally increases the likelihood consumers will give cash donations, rather than digital ones. Eliminating cash would disadvantage these types of entities in the near-term.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

A token-based CBDC that allows the Fed to supply financial institutions (FIs) with the CBDC and allow FIs to then distribute to consumers would be helpful—especially if financial institutions could otherwise offer digital wallets that implement know your customer (KYC) standards of security (FIs already require social security numbers to open an account). The IRS currently has reporting requirements for cash (> \$10,000.00) as a means of helping to detect illicit financial activity. FIs may wish to offer lower-tier digital wallets that embed currency controls (e.g. \$3,000.00 cap, as per the Bank Secrecy Act) as to not facilitate illicit financial activity, and higher-tier digital wallets that additionally add KYC standards as a means of reporting these activities as they would currently at traditional financial institutions. Since a CBDC could function as digitalized M0 cash however, reporting would be exempt from commercial transactions with counterparties with a tax-ID (KYC), such as retailers or charities. This would allow the use of CBDC in a large transaction such as buying a car, but without needing the IRS reporting requirement, as the dealership would have a tax-ID. Crime, fraud, and corruption do not cease merely because the medium changes; rather, they evolve to take different forms instead. Certainly, cash itself is not immune. However, as a CBDC should function similar to M0 cash, any digital system has a level of inherent risk that balances consumer privacy and anonymity with the benefits of the CBDC offering. "Manageable anonymity" (similar to e-CNY) would be one way to balance those risks and benefits.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

In particular, if the CBDC is backed by the US government, it should be treated same as M0 cash, with the same transactional considerations as cash.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

If CBDC is token-based, it should be treated like cash and there should be no limits for a single end user. However, as with cash, there can still be currency controls designed to deter money laundering and tax evasion. This may also require modernizing the Bank Secrecy Act.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

A CBDC should integrate with traditional financial systems such as commercial and retail banks, much the way cash is already disseminated into markets. This affords consumers the same protections under regulatory structures such as IRS, FDIC, CFPB, and SEC (with respect to currency exchange markets). Fed monetary policy (along with Congressional fiscal policy) would determine the CBDC supply as a new form of M0. Token-based CBDC would allow FIs to continue to play a significant role in developing and innovating payment structures, as well as be able to pay interest and compete. An accounts-based CBDC may otherwise disrupt competition in the financial system and inhibit fintech growth. Some colleagues and I are currently conducting a systematic review of current scholarly research on cryptocurrencies to develop a research agenda toward consumer financial protections.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

In the interest of financial inclusion—and with technological foresight that may eventually render cash moot—CBDC should have offline capabilities. I leave the technological element of that to others.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

It is possible that CBDCs could be programmed to comply with specific policies. However if a CBDC is to function similar to M0 cash, it may be paternalistic to embed such policies in the tokens, as they may unfairly politicize the CBDC itself as a medium of exchange. If CBDC as a medium of exchange is apolitical, it would be more inclusive if policy compliance is omitted from CBDC design.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

With the shift to a digital economy, there are concerns about risks to the stability of financial functions based on democratic governance and the failure of AML due to the anonymity of crypto assets. To avoid these problems and realize sound innovation, it is necessary to design and issue CBDCs with both the old and new aspects of benefits that cannot be provided by central banks alone by incorporating private sector innovation while retaining the functions that the conventional financial systems offer, such as credit creation, financial stability, and AML/CFT. For this purpose, it is necessary to inexpensively realize a financial-grade secure identity mechanism and secure value transfer among individuals and corporations by improving the public trust framework. As the leading organization for the Root of Trust, we believe that the central bank should promote such development. CBDCs should not be discussed as a single issue. Based on the discussion, we should discuss how to design a reliable infrastructure in the future digital society and consider how to realize CBDCs as a secure means of value transfer. By developing a Trust framework by all stakeholders, not only by private sectors and a group of people who prioritizes anonymity but also by public sectors and all other stakeholders, we can actively and safely promote open innovation in a digital society. CBDCs should be implemented not simply as a means of payment but also as a symbol of such innovations. They should be implemented as mechanisms for secure and flexible value transfer between platforms to be interoperable even in cross-border situations. If CBDCs is expected to compete with existing payment instruments, they will only accelerate the fragmentation of the payments market. Then it won't be easy to find the significant benefits of implementing CBDCs.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Another alternative is stable coins that the central bank does not issue. However, stable coins face many challenges, such as money laundering, cyber risk, consumer and investor protection, and the impact on stable financial systems. The major developed countries seek to impose stricter regulations on stable coins to address these challenges. Also, the payment function alone cannot generate profit easily. Therefore, when the private sector issues stable coins, it will seek revenue sources in other areas, such as data usage and advertising, which could lead to fragmentation and monopolization of the payment system. For this reason, we believe that the potential benefits would be best realized if the foundation for stable coins were non-competitive and central banks provided stable coins, or CBDCs, as public goods. We think this will promote safe and secure innovation.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?

7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?

8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?

9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?

10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?

11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?

We have our electronic cash technology. This technology is implemented using cryptographic signature technology, tamper-resistant devices, etc., and enables the safe distribution of valuable digital tokens among local devices. It enables instant peer-to-peer (P2P) payments using the most appropriate means of communication for both in-person and online payments. It also can implement functions for consumer protections and AML/KYC. At the same time, it minimizes server-side processing and costs for central banks and intermediaries. Also, since the processing load is outsourced to the device, there is no performance ceiling for the server to become a bottleneck. A token is digitally signed by both parties each time, then transferred to carry out these processes safely. Through these processes, the chain of signatures forms a closed loop. In this loop, the token is circulated from the issuing agency to individual users through the intermediary agency and then back to the issuing agency like ordinary cash and banknote. Each transfer can detect tampering by verifying the chain of signatures from issuance to receipt. In addition, verification by the intermediary agency through which the token is ultimately circulated can check if the token has been safely distributed. If any abnormality is detected at that point, it is possible to identify the culprit based on privacy-protected money flow information obtained by verification. This information also contributes to improving the accuracy of AML/CFT actions. In order to ensure the security of this system, the central bank and intermediaries operate certificate authorities that issue and distribute certificates for use by institutions and individual users, thereby positioning themselves as Trust Anchors of the digital society. By standardizing and adopting these protocols, countries can streamline cross-border processing and AML/CFT.

12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?

Electronic cash can be distributed securely with complete protection of consumer privacy through a chain of digital signatures each time it is transferred. In addition, since only Trust Anchors have consumers' personal information and issue and distribute certificates used by consumers, we can ensure traceability of financial irregularities. For e-cash, the government adopts a "token-type" CBDC that central banks or intermediaries will not manage. In the case of token-type CBDCs, there is a general concern that counterfeiting and copying of tokens, facilitating money laundering, etc., may occur. To prevent such financial irregularities, we will use a system of digital signatures, in which central banks and intermediaries become Trust Anchors. The initial issuing entity (central bank) signs on the public key information of receiving entity, using its private key, then add the receiver's public key information and signing information to the token. Each receiving party can check whether the token is forged or duplicated by verifying the signature chain information contained in the target token from the root in each token distribution process. At this point, since the signature chain includes only the public key information of each party, the consumer cannot read privacy information such as "Who bought what, when, where, and where" from the token. On the other hand, there is an opinion that central banks and intermediaries should not identify individuals for any reason; it is necessary to establish governance in a different aspect from technology. These Trust Anchors should be able to identify individuals only on an exceptional basis and only after appropriate legal processes (ex. orders from courts, etc.) for particular purposes, such as identifying perpetrators of financial misconduct. And central banks and intermediaries can achieve AML/CFT by analyzing signature chain information as information about the flow of

money when tokens are finally returned.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

In order to enhance operational and cyber resilience, it is adequate first to establish a system to conduct regular inspections in accordance with federal standards such as NIST. However, the social application of CBDCs may involve risks that existing standards cannot address. Therefore, reviewing the standards themselves is necessary and considering creating new standards with relevant organizations. From an architectural perspective, it is essential to limit the impact of each part of the ecosystem, so increasing decentralization is an effective approach. A centralized architecture based on a traditional database is a system managed by a single organization. It can be completely shut down in the event of a failure, cyberattack, or operational error. Blockchain-based distributed ledger architectures, as opposed to centralized architectures, allow for greater decentralization through the management of multiple organizations. Still, each user accesses value through a node, so if one of the nodes' fails, it affects all users connected to that node. Increased decentralization results in an autonomous decentralized architecture where each device owned by a consumer manages value independently. If one device fails, the impact is minimal because it does not spread to other devices. Improving decentralization can create an ecosystem resilient to natural disasters and cyberattacks. However, since the maintenance of the overall sound operation of the system is based on security technologies such as encryption and tamper resistance, it is impossible to avoid the risk of soundness being violated by the discovery of compromise or vulnerability. Establishing a mechanism to perform continuous technical risk analysis and system updates is essential to minimize such risk. In addition, considering that all citizens use CBDCs, it is necessary to consider measures to cover all users based on the difference in literacy. For example, it is possible to devise a UI and provide education.

*14. Should a CBDC be legal tender?*

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Whether to have offline capabilities depends on how CBDC is positioned against existing cash. For example, when CBDC is required to have a function equivalent to cash, it is necessary to enable settlement even in a state where communication is interrupted due to a natural disaster. In order to realize the offline function, it is required to have (1) a mechanism for safely managing value on the device side, (2) a mechanism for detecting illegal acts such as double use, and (3) an AML/CFT mechanism capable of responding on the device side. Regarding (1), if a smartphone is used as a device, we can use a secure element (SE) built in a SIM card or a terminal. The SE is resistant to attacks that steal secret information by observing and analyzing power consumption, radiated electromagnetic waves, etc. (side-channel attacks). It is possible to protect the value cryptographically based on the secret key stored in the SE. As for (2), we can detect double-spending by matching the history of cryptographically verifiable value transfer. It is necessary to prevent the parties to a transaction from being identified by historical data to protect personal information. In addition, by verifying the transaction history, it is possible to confirm later the correctness of the transactions conducted during the disaster. Finally, for (3), we can combine KYC with the public key cryptography infrastructure (PKI). By verifying the public key certificate issued by the certificate authority based on KYC information at the time of the transaction, it is possible to prevent value transfer to terrorists and anti-social forces in advance. However, depending on conducting the certificate revocation check, it is not possible to completely take the certificate offline. Therefore, it is necessary to consider the optimal method while balancing with reliability.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

We answer yes to the question. There are several patterns of challenges in countries where

digital payments are widespread. One is the risk that information on money flows, which used to be concentrated in central banks and commercial banks, will flow to mega-platforms if major Big Tech firms dominate digital payments. The second risk is that if there are too many providers of digital payments, so many system developments will result in unnecessary costs, and overall optimization will not be achieved. Thirdly, for digital payments to always have the same level of availability as cash, it is necessary to ensure sufficient capabilities against emergencies and security incidents. However, there is a risk that such capabilities will depend on the capabilities of private business operators. For this reason, it is desirable for the promotion of digital payments that CBDC plays a role as a safe and inexpensive means of payment for consumers. As for the method is recommended to use mobile wallets and apps, considering the increasing rate of smartphone ownership in Japan and other countries. As mentioned in answer to # 11, the electronic cash technology can store tokens issued on tamper-resistant equipment to be used in various points of sales such as mobile wallets, cash registers, e-commerce sites, and PCs. Also, since electronic cash technology is a "token type CBDC" without ledger management, we can minimize server-side processing. By reducing the initial cost, we can set the settlement fee charged to the user each time at a lower price. (It should be noted that e-cash technology does not necessarily exclude other forms of digital payments but can promote innovation in the private sector as a fundamental platform.)

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

In the case of a ledger-managed CBDC system, to make CBDC transferable in real-time, it is necessary to connect with various external payment platform systems and to perform synchronization between the balance operation of the ledger of the CBDC system and the payment in the payment platform atomically. Exclusive access control is required when processing requests related to the same account from multiple payment platforms. For these reasons, how to tackle the performance constraints is a challenge. If it is impossible to realize the real-time processing, settlement risk increases. Our e-cash technology allows valuable tokens to be transferred and distributed across payment platforms, so the above performance issues and payment risks do not arise. This secure value transfer technology between devices is a more secure and programmable update of the nature of cash and can be applied to the implementation of CBDC. If you are interested, please let us know so that we can give you a presentation.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

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1. *What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*
2. *Could some or all of the potential benefits of a CBDC be better achieved in a different way?*
3. *Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*
4. *How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*
5. *How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*
6. *Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*
7. *What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*
8. *If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*
9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*
10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*
11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*
12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

There are two types of privacy considerations in a CBDC system: (1) transactional privacy and (2) identity privacy. As the name suggests, the former speaks to the fiscal details of a transaction while the latter is that of the participants' identity. As a strawman, creating a

platform with greater transparency around both transaction details and participant identity may enable compliance with AML/CFT regulations i.e., it avoids money being used for illicit activities. However, users are conscious about the data generated in their daily payment activities. Firms could harness this data and exploit individuals. At the same time, complete anonymity is not a prerequisite for privacy. Architects and developers must be mindful of both financial crime prevention compliance (ex. AML/CFT) and transaction and identity privacy. A CBDC should not enable mass surveillance or exclusion of individuals prejudiced on protected status (including not limited to race, ethnicity, age, disability, gender, gender identity, etc.) A two-tiered CBDC architecture where a payment service provider (PSP) provides CBDC services such as account management, digital wallets, identity management, and thereby preserves identity privacy, may be considered. In transactions where a small value is involved, pseudonymized wallets may be considered. Innovative solutions like “anonymity vouchers”, which allow users to anonymously transfer a limited amount of CBDCs over a stipulated time may offer an alternative to a binary choice. In order to improve safety, and prevent sybil attacks, auditability, or traceability (with say decryption) on demand are necessary.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Distribution and replication of data across different geographically spread nodes is an essential paradigm for improving resilience of a system. Distributed ledger technologies (DLT) often utilize this to provide security guarantees (Byzantine Fault Tolerance) that is resilient to significant portion (<33%) of the network being compromised. However, these guarantees often come with a performance tradeoff. If the performance (speed & efficiency) of settlement of CBDCs don't meet or exceed customer expectations, CBDCs will not see broad enough adoption and will fail their purpose. In general, all system architects need to make a judicious choice on the C-I-A triad: Confidentiality refers to not leaking information to those who don't have access. Integrity refers to correctness in storing and processing information. Availability refers to promptness in responses.

*14. Should a CBDC be legal tender?*

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

In our view, “offline” capabilities are essential for CBDC to foster adoption and inclusion. It should be able to work in the case of network disruption events (e.g., natural disasters, cyberattacks, etc.), and should also be designed to foster adoption in under-served and remote areas, promoting adoption and inclusivity to communities who, in some ways, may currently live beyond the limits of the current banking system. However, there are numerous challenges towards building a CBDC with offline capabilities, many of which result in the creation of what is ostensibly a parallel platform. This is primarily because real-time settlements would become very difficult in an offline environment. Without connectivity, validating transactions could only occur once the user is back online. This places tremendous design considerations into both hardware and security design. To illustrate this point, one potential method is to ask users to sign transactions offline and submit them later. Normally, this is not possible as transactions rely on the transport-layer security for freshness (to avoid replaying transactions). But one possible way would be to verify the signature of transactions as part of the transaction API; this requires the payer to generate a unique nonce (randomly created or using a secure counter) to allow the service to check that a transaction is not a replay. In any case, if a transaction was signed offline, there is a chance that it will fail to execute when it is submitted to the system (for instance, if the balance of the payer is too low when the transaction is submitted to the system). The system can return a verifiable receipt that proves that the transaction failed to execute; this receipt can represent a debt obligation from the original payer.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

There are numerous additional design principles which relate to a CBDC, all of which have their unique set of tradeoffs. The working paper has described many of these principles, either implicitly or explicitly. While it is difficult to provide all these design principles within this response, many of the design elements are dependent upon the trade-offs which arise from policy decisions from Congress. These policy decisions will guide the role of the Federal Reserve, the role of the banking sector, and the role of the private sector. Other key CBDC features, including privacy and anonymity, and centralized versus distributed control, have their own set of trade-offs. These design principles ultimately lead to solution principles, including system management, account management, and identity management, all of which affect the core ledger technology. Numerous ledger structures are possible for a CBDC, and any CBDC architecture will need to meet a range of requirements – including resiliency, availability, security, speed, throughput, and scalability. Ledger design could include elements of distributed approaches. Within this paradigm, accounts and token design come into play. There are various interpretations for accounts and tokens which come into play, which relates to the data structure – i.e. whether units of value are moved between different owners (“token”), or whether account balances are increased or decreased (“account”). Within the core ledger technology, come a host of other considerations. Privacy is of critical importance of a CBDC, and is key to the eventual platform’s trust and adoption. However, privacy should not be confused with anonymity. Transactions would need to be tracked in a secure, private manner, adhering to regulation while also providing users the ability to trust the network. Balancing privacy would need to address legal concerns, such as anti-money laundering, countering the financing of terrorism, and other possible sanctions. Programmability is also another critical design choice, which might be deployed in different parts of a CBDC ecosystem (e.g. in the core ledger vs external applications). It may be preferable for this functionality to sit outside the core architecture, to minimize security risks and complexity of the ledger. Programmability will be needed to design CBDC with future flexibility and extensibility in mind. Finally, as a general principle, the core ledger infrastructure of a CBDC should be kept as simple as possible, with more complex functions provided as overlay services. This simplicity may help enable higher performance, greater security, and greater extensibility. Adoption of standardized protocols and messaging standards will be key to enabling interoperability, promoting financial inclusion and market competition, as well as to better manage security and regulatory risks.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

This might be related to subjecting the end-user to quantity limits. The monetary policy influenced by quantity limits could achieve maximum employment. The supply of cash could never make this happen.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

This might be related to national security. Probably most important is that central bank money is planned to be the most secure form of money. Central bank money may simply have a sense of order that cash never could. That's ultimately what the general public would need access to.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

14. *Should a CBDC be legal tender?*

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

This sounds controversial, but this is the most intriguing question. It also sounds counterintuitive so it should happen. This could enhance management of the financial system and encourage expansion of artificial intelligence.

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

There are two major issues with CBDCs. First of all, in the case of a natural disaster, power grid failure, act of war, or other national crisis, relying strictly on digital or electronic payments would cripple individual's ability to purchase goods or support themselves financially. There is value in paper cash in that it can be exchanged with no barrier between the buyer and seller.

Secondly, a CBDC or cashless society creates a surveillance society where every purchase is potentially tracked and therefore no longer anonymous. This can be used by the government or third parties to monitor individual's spending habits, political affiliations, religious affiliations, leisure activities, and other spending. It creates the potential for a Chinese-style social credit score system that undermines our freedoms and liberties and even violates potential fourth amendment rights. Any system promising privacy could be hacked, and if impenetrable would require the user to reveal enormous amounts of personal data (biometrics, pins, social security numbers etc) leading to other concerns, some of which run counter to our core values.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

I see very few benefits, but yes, certainly they could be better achieved in a better way. The goal to bring the dollar into the 21st century and keep the dollar as the world's reserve currency would be better achieved simply by sound monetary policy that adds value to the dollar.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

CBDC would be a net negative for inclusion, ultimately hurting the poor, elderly, and those distrustful of digital means of payment or government involvement in our lives. The CBDC does nothing that the private sector doesn't already do through personal banking/checking accounts. Many of the unbanked are unbanked because they simply do not want to be. Any public policy that forces the CBDC upon the homeless, unbanked, impoverished, or skeptical would be unethical. Further, those on the extreme fringe of our society live off of spare change and loose bills handed over by generous givers. Forcing these members of society to try to use a smart phone app, chip card, or some other means of digital payment make life less convenient, not more.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Maximum employment comes through less regulation, a business-healthy environment, and the free market, not monetary policy.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

It would be a net negative for stability. Even fiat cash is tied to a tangible product. The CBDC would allow the fed to create even more money on a whim and devalue or add value to the currency without any actual market forces. It's likely the CBDC would lead to higher inflation

and less trust in our currency, not more.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

The CBDC would destroy the private financial sector. Private banks, bailed out only a decade ago, would likely be negatively affected by those who retired their credit and debit cards, as well as bank/savings accounts in favor of a CBDC system. It would effect the financial sector differently than stable/crypto coins because cash is king, and at the end of the day, cash is backed by the government of the United States. A CBDC would undermine that philosophy. I believe it would force MORE people to turn to other nonbank money, not fewer.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

I do not believe a CBDC is a viable option. However, if it were implemented, it would need to be pegged to physical cash and hold the same value at all times. I fail to see the benefits of a CBDC.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Cash use (both physical cash and the current electronic payment system) will not decline without a CBDC. However, the CBDC undermines cash entirely. At the end of the day, if a CBDC is approved by congress, legislation should be written to A.) require all businesses to take physical cash. B.) Require the Fed Reserve to continue printing physical cash in the same quantities as present day.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

It doesn't matter, honestly. If the US Dollar is still the reserve currency (and it will be as long as our nation maintains sound fiscal policy, is economically vibrant, and remains the leader of the free world), our trade partners and other overseas agencies will continue to honor or adapt to our means of digital payment.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

We are the leader of the free world. Our decisions should influence other nations. We don't do things because other countries try them. We do things because they are constitutional and benefit our citizens.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

All of the risks can be managed by simply moving on from the idea of a CBDC. The risk/reward isn't in digital currency's favor. We are trying to solve a problem that doesn't exist.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

There is no way to do this. Either the CBDC provides total anonymity (which is technologically impossible) and is prone to illicit activity and theft or the CBDC offers no privacy and can be monitored/hacked/controlled by both the government and bad actors. There is no middle ground available, and both options are negatives. Any system that requires the user give biometric data or be forced to carry a semiconductor on them at all times is unethical and would eventually end up in fourth-amendment violations. Even if the CBDC is implemented, physical cash should ALWAYS be an option, participating in the CBDC should be voluntary, and there should not be coercion through making the CBDC worth more than physical cash or incentives to join the CBDC system.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

It's unavoidable that CBDC accounts would be hacked, fraud would be committed, citizens would lose access to their money at times, and disruptions in infrastructure could provide citizens with no means of payment for vital goods.

14. *Should a CBDC be legal tender?*

No

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

No. If it is enacted it should be treated like a traditional currency.

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Yes, if that promotes the use of traditional cash.

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

This is a complex issue that would be resolved by simply avoiding the CBDC altogether.

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

I can't see how this is possible using our current technology, and any "offline" possibilities I can think of seem to bring about ethical concerns.

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

There are already current payment options that work well, thanks to private sector innovation. The easiest method, however, continues to be "hand someone a dollar, and they hand you a Coca-Cola"

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

This would create a nightmare entanglement of private payment platforms and government-run bank accounts. Again, solving a problem that doesn't exist.

21. *How might future technological innovations affect design and policy choices related to CBDC?*

I think regulators/legislators must think long and hard about potential violations of privacy, liberty, freedom of movement, and bodily autonomy that would be introduced by emerging digital technologies. Any CBDC should include regulation that secures our rights to the above and mandates the continued availability/use of physical cash.

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

I'm not convinced of any legitimate benefits of CBDC.

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*Name or Organization*

Standard Chartered Bank

*Industry*

Bank, Large (\$90 Billion or More in Assets)

*Country*

United Kingdom of Great Britain and Northern Ireland

*State*

*Email*

yinteng.choy@sc.com

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The Federal Reserve has already provided a comprehensive overview of the benefits, policy considerations and risks of a CBDC in this paper, of which we would consider banking disintermediation to potentially be one of the most critical changes to the financial system, with subsequent knock-on effects for bank funding costs, and credit creation and availability for households and businesses. The Federal Reserve has identified an intermediated model as a potential core design principle for a U.S. CBDC, and we are supportive of this. Nonetheless, the private sector's role in a CBDC ecosystem must be clearly understood, with the creation of a level playing field, including whether/what new and alternative revenue models will be permissible for regulated institutions. As the paper notes, without a CBDC, households and businesses might increasingly use nonbank money such as stablecoins as a substitute for bank deposits. Due to the network effects of innovative payment offerings, new private players could quickly dominate the monetary system, leading to competition concerns, risks to consumers and the public interest, and the stability of the financial system. While CBDCs should not crowd out private innovation or supplant new forms of digital money, CBDCs could responsibly anchor emerging digital commerce ecosystems, provide a regulated platform on which programmable and composable financial products can be established, mitigate concentration risks in payment systems and encourage competition and innovation between banks and new entrants, while remaining a neutral public good.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

It is possible that some of the potential benefits of a CBDC, such as efficiency gains, enhanced resilience, greater financial inclusion and consumer confidence in digital systems may be realised through improvements to existing payment systems. However, other forward-looking enhancements may be more difficult to realise in the context of existing infrastructures, such as programmability (in commercial applications and potentially, fiscal/monetary policy applications) or real-time data flows to supervisors. Nonetheless, as a general observation, the issuance of a CBDC, improvements to existing payment systems, and the development of new forms of digital money do not have to be mutually exclusive. A CBDC could be a component of improved payment systems and/or interact with existing or new forms of payments infrastructure. Any type of future payment innovation will need clear regulatory treatment and frameworks. Interoperability (e.g., between payment systems and new forms of money, including but not limited to CBDCs) will also be critical going forward, particularly to enable smooth transitions between formats and infrastructures.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Yes. It is not however a panacea. It is important to identify the root cause of financial exclusion in the U.S. and appreciate the limits of a CBDC to address broader societal and economic obstacles. For instance, a CBDC may not be as impactful should financial exclusion stem from different policy issues such as digital illiteracy, a lack of documentation or inability to qualify for bank/intermediary services. The introduction of a CBDC may increase inclusion in digital-only retail environments, which could result in greater inclusivity challenges where digital illiteracy is prevalent. To address this risk, the U.S. CBDC could be distributed to those that lack basic digital skills through a simplified technical platform that would not need access to the internet or a smartphone. A "low-tech" CBDC would pose some technical

implementation issues around the capture of transactions on a real-time basis, which may require limits on the frequency and amounts transacted on an off-line basis. A “low-threshold” CBDC could provide a different solution to financial inclusion, e.g. users could be permitted to open a CBDC wallet for low value transactions by providing a mobile number only. The creation of a CBDC financial footprint may in turn enable access to other financial products.

*4. How might a U.S. CBDC affect the Federal Reserve’s ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Any interaction between a CBDC and existing monetary policy tools will need to be carefully scrutinized and understood. Some CBDC designs could enable the implementation of monetary and fiscal policy, for instance by targeting interventions to specific sectors depending on the needs of a particular economic sector at a specific point in time, and allow near real-time and more precise monitoring of supply, utilization and consumer pricing data for the Federal Reserve. The potential impact of a CBDC on monetary policy will need to be factored into key questions around design and distribution, including remuneration rates, ease of use, holding limits and potential intermediary services such as deposit services.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

The effects of a CBDC on financial stability will depend in part on the design of the CBDC and the role of commercial banks in the CBDC ecosystem. We are supportive of a public-private model that leverages existing roles and responsibilities, including commercial bank intermediation between the central bank and consumers. A CBDC could potentially change the financial sector’s market structure as it could create an alternative to commercial bank money and banks rely on deposits to fund credit creation for businesses and consumers. These risks could be mitigated by the design choice of the CBDC, as well as by ensuring a careful and gradual transition period. This would allow the CBDC issuance to be monitored and adjustments to be made to the policy environment as needed, based on data analysis relating to a bank’s funding model, shifts and impacts on deposits, the overall size of a CBDC issuance and its liquidity and other market indicators such as lending rates and costs. In addition, the Fed could also consider initially limiting the use of a CBDC to specific purposes only thereby managing any potential disruptions to the financial services ecosystem. However, the effectiveness and use of limitations will be dependent on the chosen use cases for a CBDC. Examples could include: designate the use of the CBDC for specific transactions only, place transaction limits on certain types of transactions, enforce limits on holdings to discourage the use of CBDCs as savings or implement different limits for individuals and businesses. Careful management would need to be undertaken to ensure that limits across different accounts belonging to the same beneficiary are able to be identified and enforced.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Yes. It is possible that a CBDC could adversely affect the financial sector, the extent of such impact is difficult to predict. It is subject to variables such as technological design considerations, the regulation of CBDCs in relation to the regulation of other new forms of digital money as well as market dynamics such as adoption rates and consumer preferences. Consumer education on the difference in risk profiles, liability and redemption rights between CBDCs and other forms of non-bank money will be critical. In times of market stress, the availability of a CBDC could cause a run from commercial bank deposits to the comparative safety of a CBDC, which could have an acute impact on the financial sector. While some risks may be similar between a CBDC and stablecoins/non-bank money, for instance the potential impact on bank deposits and credit creation, there are other risks that are significantly different. Stablecoins represent an iteration of the existing monetary system, and to be trusted, they must engender the same confidence in users as well-established commercial bank money. Stablecoin backing models are yet to be clearly regulated in most jurisdictions, along with core operations such as issuer authorisation, reserve management and redemption rights. As a privately issued form of money, stablecoins and its regulation must also address legal claims, capital requirements, liquidity requirements and what support would be expected from the central bank during a stress event as a backstop to compensate depositors in the event of failure. The variety of stablecoins’ backing models, e.g. by central bank reserves, high quality liquid assets or commercial bank deposits may also cause broader impacts to banks’ balance sheets, liquidity positions or sources/costs of funding. Different types of stablecoin may be treated differently from a regulatory perspective. Many jurisdictions are currently considering how to implement stablecoin regulation and considering how stablecoins, non-bank money and CBDCs may or may not co-exist alongside traditional forms of money. In contrast, as the Federal Reserve has noted, a CBDC would not require deposit insurance, or backing by an underlying asset pool to maintain its value, providing it is

a safe digital currency with no associated credit or liquidity risk.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

As previously mentioned in Q5, a gradual and carefully managed transition with close monitoring that allows for data-based calibration of policy may be a mitigant to any potential adverse impacts of CBDC on the financial sector. Other possible mitigants include holding limits and remuneration models, though each will require more research and analysis. For instance, a cap on holdings and non-interest-bearing features of the U.S. CBDC would present practical implementation issues, such as a potentially unfair distribution of accrued interests to CBDC holders and the handling of involuntary breaches of limits by holders. A clear understanding of the benefits expected to be achieved and their tracked progress for the researched and chosen use cases would also be important.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes, as direct consumer access to central bank money is one possible mechanism for anchoring confidence in payment systems and money in a digital world. It is difficult to predict what consumer models, preferences and behaviours will emerge as the economy becomes more digital. We therefore share the view expressed by central bank authorities globally that CBDCs can and should coexist alongside other forms of money, much as banknotes and deposit accounts coexist today. CBDCs can help ensure the availability of reliable exit and recourse options for holders of private forms of digital money, as well as promote interoperability and substitutability across existing and future payments systems both domestically and internationally. A CBDC that coexists with other forms of money and leverages the experience and structures of the commercial banking system, while enabling payment innovation, could ensure that consumers are safely protected in a well-regulated and established financial framework, able to choose from a wide range of secure and innovative financial services products while reducing the risk of activity becoming concentrated in any single service provider or network.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

This sector remains in the early stages of development and it is difficult to identify the future evolution of payments as technological capabilities and understanding grows. In the absence of a CBDC, larger private players may dominate the payments space, potentially creating concentration risks and data siloes that are further reinforced by network effects. CBDC could offer smaller entrants a secure platform to equally participate and innovate in payment or financial services, which could potentially boost consumer choice and provide new products.

Regarding cross-border payments, there are a number of ongoing cross-border payment initiatives, though not all rely on CBDCs. At this early stage of evolution, it is not yet clear whether a CBDC will be a pre-requisite to participation in future cross-border payment frameworks.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The future scope and extent of use of CBDCs in global commerce and trade is not yet clear, with research literature on the cross-border spillover effects of CBDC still developing rapidly. The U.S. should seek to understand the rationale, use cases, design and issuance models of other large economies, and when quantified, whether these would also apply to the U.S. The cooperation and information sharing among central banks on their CBDC research and progress with one another will be helpful in this regard, particularly in investigating the possibility of harmonized standards for technology, inter-operability and shared policy goals. Another aspect to be considered is that it is possible that in the absence of a local CBDC, a foreign CBDC issued by another major market central bank could be favored over local currencies, particularly in jurisdictions with volatile currencies or fragile banking infrastructure, which could exacerbate risks and concerns relating to cross-border capital flows and FX rates. The decision to issue a CBDC will also need to take into account the balance between cross-border interoperability and access and other policy objectives such as control over CBDC use and financial crime controls. The issuance of a CBDC could anchor public trust in a jurisdiction's central bank money, in an increasingly digital global economy with rapidly evolving consumer needs, and the falling use of cash alongside new forms of non-bank digital money. As mentioned earlier the existence of a national CBDC may also be a precondition for participation in future international cooperative payment initiatives or networks that could enhance cross-border payments.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

As mentioned earlier, we are supportive of a gradual and carefully managed transition to a CBDC, to minimize any abrupt systemic shocks and to ensure time for needed adjustments. This could entail the imposition of initial limits on CBDC use, and such limits may mitigate macro financial stability risks, but also test operational resilience and system performance. Other than limits, calibrated incentive structures (e.g., via regulatory requirements around liquidity at a wholesale level, or negative remuneration for consumers above thresholds) could be used to control incentives for use. Sharing of findings from CBDC experimentation and industry consultation across jurisdictions will also be important factors to identify and figure out how to tackle risks as they arise.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

A holistic approach should be adopted so that, for example, data privacy and protection requirements are aligned with cross-sectoral rules for the use, processing, and management of data. Data rights in a CBDC system will need to be made clear, including the degree to which the central bank or intermediaries may have access or ownership over them. Privacy does not mean anonymity and many controls to combat financial crime are designed to aid traceability and counterparty identification to establish the purpose of a payment. To execute these controls, the relevant information only needs to be available to select parties including private firms performing identification services. A well-designed CBDC ecosystem may in fact help to increase the privacy of transactions while enhancing traceability and identification of counterparties and the purpose of a payment. Service providers and regulators will need to continue to work together to strike a balance between privacy of the individual and the integrity of payments and banking ecosystems.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

The network effects of private bigtech entrants into the payments space may amplify concentration risk and the creation of data silos for exclusive use of such private firms. A CBDC might reduce such digital or payment system monopoly by private players, helping to increase the diversity and resiliency of the domestic payments landscape. In building a CBDC ecosystem, all participants should be regulated to meet similar robust standards equal to existing industry operational or cyber resilience standards, such as the CPMI-IOSCO's guidance on cyber resilience for financial market infrastructures, or the U.S. National Institute of Standards and Technology cyber resilience framework. Other considerations may include compliance with national security standards or regulation for critical national infrastructure.

Any technology used in a CBDC must be proven to be "enterprise grade" for the use case being considered and potential issues such as scalability need to be considered.

*14. Should a CBDC be legal tender?*

Yes, CBDC should be legal tender, particularly if intended to be used as a means of payment in the U.S.. It will also be important for CBDCs (including non-U.S. CBDCs) to be treated from a regulatory standpoint as a digital form of fiat rather than as a cryptoasset. The legal characterization will inform complex considerations around what rights will be associated with it, questions of title and whether it constitutes property, amongst other things. In turn, this will have an impact on issues such as how transfers will occur, how lost or stolen CBDCs would be traced or treated and what liabilities may arise in this context (in this respect, CBDC may be closer to bank deposits than physical cash but this is not necessarily a foregone conclusion and will depend on how the instrument and the rights associated with it are structured), and whether security can be effectively created over the CBDC. It may also be important to consider whether there are material impacts of a U.S. CBDC being accepted as legal tender in jurisdictions beyond the U.S., as the U.S. Dollar is currently used in other jurisdictions globally today.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Remuneration rates will likely be one of the most critical tools to manage the risk of bank disintermediation and prevent financial instability, even in a low interest rate environment by flipping to negative rates. The Federal Reserve should be able to utilize interest rates (including negative interest rates) to control the use of a CBDC (e.g., as a means of payment or a means of investment) in a way that might mitigate the replacement of current forms of money. The impact of remuneration rates on the commercial sector should be clearly

understood and carefully calibrated. For instance, the implementation of a negative interest rate policy may cause consumers to exchange the CBDC for central bank non-digital liabilities such as banknotes. Any attempt to limit such flow may result in the U.S. CBDC being traded at a discount over its nominal value. Conversely, an uncapped and interest-bearing CBDC may contribute to further strengthening the haven demand for the U.S. currency. Sustained demand from countries suffering from currency substitution may result in significant capital flows which could accentuate the risk of contagion. A tiered remuneration system could minimize run risk in times of stress. The utilization of interest rates on a CBDC should also be considered alongside other features, such as holding limits and offline storage. We also note that the rate of interest policy may need to differ between the retail or wholesale application of a CBDC.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

As mentioned earlier, holding limits may be a valuable tool in the context of a managed transition to a CBDC. The effectiveness of quantity or holding limits will be contingent upon the ability of the CBDC ecosystem to identify and limit CBDC wallet amounts to each individual, digital national identity or corporate. For instance, an ability to aggregate CBDC holdings across different corporate entities, trusts or individuals, could diminish the effectiveness of holding limits. A cap imposed on individual holdings, a possibility contemplated by the paper, would constrain the use of the CBDC and, consequently, may diminish its effectiveness and usefulness as a means of payment. Technical challenges of implementing holding limits must be accounted for, such as involuntary breaches of the limit on a recipient account when a payment to it is made, though this could be mitigated by sending the excess CBDC to a linked commercial bank account.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

We are supportive of an inclusive level playing field, supported by strong regulation, particularly in a conduct, capital and financial crime context. Competition must also be regulated within the CBDC ecosystem, such that incumbents and new players are regulated equally. Depending on the nature and functionality of the CBDC and the precise role envisaged for ecosystem participants, regulatory requirements for intermediaries may vary depending on the activity undertaken, the level of risk presented and the principle of “same risks, same regulation” should be upheld. Banking risks should not surface in a non-banking sector. Where currently unregulated entities are permitted to become intermediaries, the central bank must consider the process by which such entities might become intermediaries with potential access to a central bank’s balance sheet, and how such entities will be supervised and regulated to meet the high standards expected within the financial services industry. Regardless of the CBDC ecosystem structure, one of the most important considerations will be the liability framework amongst the various participants, identifying liabilities or risks in respect of the CBDC and any overlay services provided, for instance in the event of fraud, failed transactions or privacy violations. The allocation of liabilities must be clearly articulated.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes. Offline capabilities will be a critical feature of a CBDC in the event of any disruptions to the network, to accommodate circumstances where the network cannot be reached, or to mitigate social barriers to financial inclusion such as a lack of internet access or electricity. Other jurisdictions have explored offline options such as smart cards where settlement on to cards takes place in real time, with tokens moving between cards and without the need for a back-end settlement system, or information transmission through protocols available on the 2G and 3G networks, and QR code-based payments. However, this may still require mobile network functionality such as Bluetooth, camera-enabled mobile phones or NFC point-of-sale devices. Offline functionality could also be enabled to a limited degree, for instance, in certain payment circumstances, or within certain monetary limits or tiered wallets. However, practical challenges include the enforcement of holding limits, addressing potential double spending, risk of fraud via fake tokens, and recovery of lost CBDC storage.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes, a retail CBDC’s success will depend on its adoption rates, and ease of use and wide acceptance will be critical to its adoption. Beyond that, regulated intermediaries will play a critical role in offering attractive value-added overlay services. CBDC users could also be offered, where possible, the choice of a variety of payment devices, such as prepaid CBDC devices, cards with offline capabilities or smartphone wallets that are standalone or integrated

with payment (bank or non-bank) apps.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Interoperability and convertibility between a CBDC and other forms of money and platforms will be critical to the adoption rates and success of a CBDC. Common technical standards will need to be set out and enforced within the CBDC ecosystem, to ensure a robust operating environment that safeguards data and privacy while supporting an open ecosystem for future development of innovative services, and where incumbents and new entrants can equally compete. Common standards should be established around any future services or functionalities that could be developed and offered by intermediaries, such as programmable payments.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Interoperability will be a key policy choice that needs to be fostered, including across existing financial market infrastructures, other cross-border CBDC systems and future new forms of money. Without such interoperability, a CBDC may lose its relevance and attractiveness to consumers. Private payment infrastructures may not support interoperability across one another, and a CBDC ecosystem might play a role in bridging such a gap. New technologies should be explored with a view to understanding how they might be applied to increase the overall benefits and value proposition for a CBDC e.g. future-proofing, analytics, AI or technologies that could be deployed to enhance operational resilience or security with a view to designing the next critical payment infrastructure of the future. Advancements such as a federated CBDC architecture or sharding may offer a better balance between performance speed and security, or future functionalities like the tiering of interest and fiscal policies.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

The paper's identified preferences of "privacy protected, intermediated, transferable, identity-verified" are principles for a CBDC that we are supportive of. However, additional design principles will be influenced by the primary use case for a CBDC, such as availability (e.g., 24/7 payments), inclusivity (e.g., digital literacy, compatible hardware), or competitiveness. A key design principle that must be considered is security – a CBDC must maintain the highest standards of cyber security against cyber-attacks, as well as clearly identifying responsible parties and methods of recourse in the event of a fraudulent attack. However, a strong secure system may require a tradeoff with system transaction processing speed or ease of use when multiple verifications are required. Centralised security features may also be more difficult to implement with offline capabilities. A CBDC's infrastructure should also be flexible and scalable, to accommodate any future technical or policy changes as the CBDC system matures, transaction volumes increase and new findings are made. However, such flexibility in computational loads will need to be balanced with the cost of computationally demanding privacy methods or any other features that add to processing demands on the system. The paper already notes the difficulty in balancing consumer privacy rights and the transparency necessary to deter criminal activity, which is a core tradeoff.

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*Name or Organization*

*Industry*

Individual

*Country*

United States of America

*State*

Hawaii

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

No benefits to the general public if monetary regulation by the Federal reserve. Federal reserve has become too political it no longer has the confidence of the American people. The risk far outweighs the benefits for the general public, as the federal government and the federal reserve helped moved us into this rising inflationary period that is causing the general public to be in such economic pain that only benefits the rich.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

the individual account holder (general public) have a 2 step authentication process with passcode for monies to be withdrawn or expired or frozen. Security that allows for privacy and full control over ones own digital monies that does not get filtered through the federal reserve before being withdrawn or deposited into an individuals bank account. The government already has enough control over personal finances and has already corrupted the federal reserve system.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

It could have been positive. But the federal reserve compromised itself by becoming to entangled with federal politics and the stock market. The has enhanced insider trading and lobbying for personal gains in congress and the house of representatives. The federal reserve is clearly not working in the best interest of the people. How can there be any integrity when this information of CBDC regarding public feedback has bare minimum coverage for education or understanding for the people.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

First, its position of appointment. Additionally, how can it effectively implement monetary policy when they are in direct contact with congress and members of the house of representative being able to have insider trading knowledge, lobby for personal gain, and exposure to elite pressure for financial gains. The federal reserve has been unable to work independently of the Federal government and its direction. If this was not the case the federal reserve would have closed off trillions of dollars of tax payers money from leaving the country without proper accounting and subject to fraudulent and excessive inappropriate use of funds. Example- Rush through a 40 billion dollar package to Ukraine while we cannot get unanimous votes to fund feeding our starving babies here in the US. Not to mention the subpar care and sub standard of living for our elderly & veterans. These are just the ongoing issues. lets address how the middle class is shrinking, needing to jobs to get by, but yet are the ones that pay the most in taxes. Trust needs to be fixed first before we can do better in the future monetarily.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Under the current policies for the last 30 years, no matter if you are republican or democrat it cannot help. The money (fiat or digital) is not the problem, it is the people running the show

that is the problem. Federal reserve, the federal government, along with the elite have sucked everything out of US for pure profit, corruption, and greed. You are the entities that have negatively affected the financial stability of this economy. Weaponizing the greenback and pumping the economy with liquidity and stealing everything from tomorrow.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

With its corruption- see response to above #1,2,3,4, and 5 question. The difference is the blockchain technology and the ability stable coins have to decentralize. CBDC is the exact opposite and centralizes all monetary transactions that can be used as a source of monetary purchase control over people and invade their privacy. We should be focusing on education to citizen on how the backend transaction technology will work for digital currency. the problem with disinformation is that the federal reserve and the federal government does not tell the whole truth. The truth is, not many people know about this CBDC 120 day open public response page you have here. Why was there not so much propaganda on this as there is on everything and everywhere else the US government wants to spend all of the taxpayers hard earned money? How can people make decision when they do not know or understand the information being presented? Is this what the free world looks like or does that word free only apply to some?

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Lets first state the obvious, the blunt tools currently available to the federal reserve is not working! We are in a world recession with many factors, one of them being the USD. The US financial decline started in January of 2022 because we did not get financial grip on GDP in 2021. This is because of GREED, everyone wanted to make up for the lost time monetary time in 2020 and the federal reserve let it happen! If the federal reserve is a private sector then they need to be a private sector that is not swayed by politics. This reserve would need to open to the competitiveness of the world where the CBDC would be pegged to either oil, gold, or exports funds. We may need to come to grips that the US dollar may not be in the first position, stop the GREED!

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

yes, once the federal reserve is back to being a private sector provider all pensions and retirements funds should have the option to be put into a CBDC that is pegged to gold. That can be drawn on from the age of 65. We should start somewhere to untangle the complete disaster of greed and fraud that has occurred in this country. This fallacy has allowed for the biggest transfer of wealth to occur rapidly in the last 3 years.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

We cant. If we are really a part of the free world and land of opportunity, then we need to stop this corruption of looking for the cheapest labor for the most maximum profit at any long term cost to the American people. This is the reason why everyone became "off shore" workers and we started importing all of our goods. We need a change of culture, we need to start producing our own, taking care of our own first, and practicing what we preach from a humanitarian level. This current culture of supremacy and blaming everything on everyone else is not working for the American people, it is only perpetuating a new breed of self centered entitlement and distrust.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

If we want to effectively be in the world market we will need to regardless.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

1)Separate the federal reserve from federal government. 2) do not allow anyone in congress, the house of representatives, or anyone in public office to be able to trade on the stock market. 3) Make shorter terms for how long someone can stay in government. They MUST be voted in by the people and not appointed or represented by unions or private interest.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity*

*and facilitating illicit financial activity?*

The only way is blockchain technology, but that is still in the works and education would be key for the people.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Individual passkeys, external wallets?

*14. Should a CBDC be legal tender?*

Yes

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Yes, because it is the peoples money.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Single end user with multiple authentications if external wallets are not an option which they should.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Crypto banks with high levels of cyber security/servers, with people that can provide training and education to individuals. End user should have full control and understand either how to use it or appoint a chosen custodian.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes, personal external digital wallet.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Smaller general bank accounts that is uploading funds securely. Similar to how we currently use a checking and savings account.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Ofcourse, Intellectual property and all. I dont think that information should be just given out, this is something you hire people for and not just the cheapest people who don't care so criminals can skim off the top.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

It can be very similar to Bitcoin.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Yes, the principle of working for the people!

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*Name or Organization*

Alliance For Just Money

*Industry*

Other: Civil Society Organization

*Country*

United States of America

*State*

Illinois

*Email*

reform@monetaryalliance.org

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

A potential benefit, not considered in this paper, is that CBDC can provide a pathway toward ending bank creation of money altogether. Compelling reasons for ending bank creation of money have been given recently by Omarova in "The People's Ledger" (<https://scholarship.law.vanderbilt.edu/vlr/vol74/iss5/1>) and previously by many others (see THE LOST SCIENCE OF MONEY, by Stephen Zarlenga, 2002). In that way money creation through the Fed can become available to serve the needs of society as a whole. Banks can continue to meet borrowing needs by lending pre-existing CBDC instead of creating it themselves out of credit. Money created by a public central bank can be directed to meeting public needs. Indeed, we believe the only logical, viable, stable, Constitutional, economically sound and just way for CBDC to be introduced is part and parcel with sovereign money reform, as laid out in the 2011-12 National Emergency Employment Defense Act (<https://www.congress.gov/bill/112th-congress/house-bill/2990>), which the Alliance For Just Money (monetaryalliance.org) has updated for 2022 as the American Monetary Reform Act (AMRA, available upon request, reform@monetaryalliance.org). Another potential benefit of the shift from bank created money to central bank created money is that it could begin to address the extreme maldistribution of wealth that currently threatens democracy and social stability. New money created by banks goes to those who already have money; it concentrates wealth. Spending of newly created money on public needs through CBDC provided to the government with no corresponding debt has the potential to counteract wealth concentration by distributing the country's resources more evenly, and more justly.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes. Digital currency could be issued by the Treasury Department instead of by the Fed. New money could then be spent into circulation, as the Greenbacks were, rather than being lent into circulation. That could bring the expansion of public debt to a close. It would have to be done with guardrails against government spending exceeding the capacity of the economy to use it for expanded production of goods and services. The above-mentioned legislation lays out how this transition to wholly public money can be achieved in a graceful and timely manner and be effectively maintained and modulated over time by an independent monetary authority in the Treasury.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

It could have a positive effect, but it depends upon how it is done. Automatic opening of Fed Accounts for everyone, plus access through the post office could certainly improve financial inclusion.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Monetary policy, via the setting of interest rates and open market QE, has never been very effective in achieving these ends. A. A CBDC which can be channeled into government spending in the public interest could certainly do a better job of keeping people employed. There is certainly much to be done that can be done by human power. B. Having the central

bank (or monetary authority in the Treasury) actually control the money supply would do much to control booms and busts that are known to be accentuated by bank creation of money. Price stability is shaken by booms and busts, although it is also affected by other things. Central bank control of the money supply could potentially eliminate or at least attenuate the boom/bust oscillations, but it would depend on the ability of the government bureaucracy, including elected representatives and monetary professionals all working as public servants, to be able to respond with adequate speed.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

As pointed out in #4 above, central bank or public control of the money supply could switch the money supply system from being an unstable, positive feedback system to being a stable negative feedback system. In the current system of bankmoney creation, the money supply grows when growth is not needed and shrinks when it is needed – the boom/bust amplifier. Central bank control, done in partnership with the Treasury Department could reverse that and stabilize the system.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

The financial sector will have to change in response to the introduction of CBDC. If money creation shifts from commercial banks to the central bank, banks will have to shift their business plan. They will have to shift to credit intermediation from credit generation, in the terms of Hockett and Omarova's "The Finance Franchise" (<https://scholarship.law.cornell.edu/clr/vol102/iss5/1/>). Stablecoins are an entirely unsatisfactory basis for a money supply. Despite promises of staying linked to the dollar through risk-free investment in treasuries, they will go beyond it, just as Money Market Mutual Funds can and did. Stablecoins will have to be bailed out in the next crash just as MMMFs were in 2008.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

During the transition from money creation by commercial banks to money creation by the central bank, banks may have to borrow from the Fed in order to sustain their liquidity. In the long run, investment money flowing into banks for lending on a credit intermediation basis will sustain liquidity.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes. It is also clear that digital access is not available to nor preferred by all, and we also must be ready for internet and/or electric grid disruptions. Thus, cash must remain a sanctioned and accessible medium of exchange. It should be forbidden for a business or unit of government not to accept legal tender of any form.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

In the absence of a CBDC banks will continue operating their payment services, but other private digital currencies and so-called "stablecoins" will compete and are likely to destabilize the system.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The decision of whether, how, and when to implement CBDCs should be based on a studied conclusion that it will help the United States people, not on whether other countries are doing it. But if we don't move to have better control over our monetary system and economic resources, we will fall behind. Credit guidance, that is, directions from the central bank over how and from Congress over where newly created money goes—can play a major role. It was essential for the rapid recovery of Japan following WWII, as documented by Richard Werner in his 2003 book, PRINCES OF THE YEN, and for the rapid industrialization of China in the recent past decades.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

**A. RISK OF CHANGE TO FINANCIAL-SECTOR MARKET STRUCTURE.** A non-interest-bearing CBDC is the way to go. A CBDC must function to protect the payment system, not serve as an investment vehicle. Investments should reside in the private sector. CBDC must provide safety, not a profit source. **B. SAFETY AND STABILITY OF THE FINANCIAL SYSTEM.** It is not clear that limits will need to be placed on CBDC holdings, especially if the CBDC is non-interest bearing. Should a need for limits become apparent, it can be achieved via demurrage on the portion of a balance that exceeds the limit for longer than allowed, a charge that can be easily avoided by the account holder moving the excess CBDC to a time deposit, savings-and-loan account, or investment fund. **C. EFFICACY OF MONETARY POLICY IMPLEMENTATION.** The real purpose of monetary policy is to determine how much money is and should be in the system and how needed new money is introduced into circulation (i.e., spent, lent, given, or invested) or (much rarer) how to withdraw some existing money from circulation (i.e., taxed or borrowed out of the economy). Congress then decides who gets the new money for what public purposes. Currently the Fed does not control the money supply. It influences it by the setting of interest rates and open market operations, but these are weak tools. They are clumsy, imprecise, and only indirect. With CBDC, money creation by banks could be halted and the Fed could actually control the money supply in the public interest. In addition, all the seigniorage from the creation and first use of newly issued CBDC, coins, and even paper bills can go to the public sector, unlike in our 109-year-old FRBS in which banks gain the seigniorage from all the paper notes and bankmoney, which together comprise over 96% of our money supply. This would be a net gain for the public.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Government needs to know financial information from individuals in order to receive or refund taxes and to determine if they are paying their taxes appropriately. Anonymity would only facilitate illicit activity. Powerful private companies already monitor how we spend our money. We see a strong need for privacy and respect for privacy, but no need for anonymity. What is needed is more transparency, not less. There are already certain "firewalls" within the government to protect financial information, particularly between the IRS and other branches. Such could be created to protect CBDC accounts to strike the proper balance among privacy, confidentiality, accountability, and transparency. Within commerce, the vast majority of money transactions are transparent; we write checks, use credit cards, bank transfers, etc. That private information is protected and regulated and subject to normal legal accountability and due process. A relatively small amount of money is in the form of cash which does provide near anonymity, though each bill has identifiable serial numbers and dates. The same level of legal protections and privacy should and can be provided to CBDC as is provided for our current form of digital money (bankmoney). The same level of accountability by users of the public utility, legal tender, should also be expected. Despite our belief in the possibility of good government, much of the public is skeptical. The Fed being bank-focused and the limitless role of money in politics today are reasons for distrust. This skepticism and wide-spread ignorance about money and our monetary system are the best protections our current system has, a state of affairs we find tragic. Recent actions by federal governments to shut off the bank accounts of people and foreign governments when they don't like what those parties are doing, without the formal processes required by law, makes achieving CBDC and Just Money much harder.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

This is an important concern. But it is not unique to CBDC. It is a growing challenge that CBDCs and any sovereign Just Money system share with all types and levels of industry, financial and otherwise. Regarding operational and cyber resiliency for CBDC, central banks and their associations such as the Bank for International Settlements (BIS) have been developing payment, clearing, and settlement systems over centuries already, for the digital age since 1980 (<https://www.bis.org/cpmi/history.htm?m=3066>). Technologies like blockchain, cryptography, and distributed ledgers can also play a role in CBDC if they prove to be compatible with the demands of ecological sustainability. Regarding cybersecurity, correcting our money system will not alleviate all financial fraud. But it will eliminate the moral hazard widely understood to be built into modern banking (see McMillan's 2014 *THE END OF BANKING*, pp. 16, 40-46, 84, 98, 117, 179-80). That will foster operational, cyber, and human resiliency not only for our money system but also in the wider economy, especially in big tech, and in the culture at large.

*14. Should a CBDC be legal tender?*

Absolutely. Without it being legal tender, you would just be playing games at the expense of

people and planet.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

No. As stated above, a CBDC must function to protect the payment system and to protect the money used in the payment system by providing a safe digital account. Money is not a liability but our liquid asset. CBDC is not to function as an investment vehicle. Investments and profit-making should reside in the private sector. CBDC must provide safety, not a profit source.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

This is not likely to be needed as long as CBDC accounts remain non-interest-bearing. The rules should apply equally to all forms of money. See also our response to #11.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

For CBDC to be inclusive, many intermediaries have to be involved. For transaction accounts, as long as the contracts with the intermediaries are well written, it could be a variety of firms, public or private, including post offices and public banks. They will have to be compensated appropriately for the work they perform as intermediaries. In the case of usage of private firms, the cost could be borne by the individual holders of the Fed Account as the market bears. In the case of usage of the post office or other public providers, the cost, if borne by users, must be kept low. Savings-and-loan and investment services for central bank money (CBM), including CBDC, should be entirely in the private sector. Trying to placate private industry is not the job of government. Banks or peer-to-peer lenders should do what they do best, authenticate and facilitate loans to credit-worthy borrowers, lending their own money or savers' time deposits; they should no longer be able to create money out of credit. Investment firms will invest their and their shareholders' or investors' funds at their own risk. If Congress wants to appropriate funds for certain types of public purpose lending, this may be funneled through the Treasury's underwriting facilities. The payments system of banks, savings-and-loan, credit card providers, etc. has to be appropriately regulated, and so should any fintech competitors among those systems. But, as McMillan (2014) points out, once money and credit are distinct, with the public creation and modulation of money and the private organization of credit, "credit no longer requires a special treatment....Government should implement a competitive regulatory framework around credit that treats the financial industry just like any other industry. In essence, such a framework includes an effective and efficient legal system to enforce private contracts, the prosecution of market participants that engage in fraudulent practices, and antitrust laws to ensure that markets are not cartelized or monopolized by powerful actors" (pp. 165-6).

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Probably not. This is a digital currency; that means online and/or in electronic accounts. Offline transactions can still occur using US bills and coins issued by the central bank or Treasury Department. Small denomination and refillable CBDC smart cards like gift cards or sim cards could be purchased and used at retail stores that have or develop their own internal point-of-sale swiping systems.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes. Payment by check or electronic transfer should be made possible to convert one's bank money to CBDC. Use of debit cards should continue with CBDC. The so-called fintech industry is developing and providing these services already. Again, we advocate all US money in circulation, whether paper, coin, digital or account-based, be public money and legal tender, what we call sovereign or Just Money.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Different payment platforms will simply need their own CBDC accounts. As described by Hockett and Omarova in their 2017 "The Finance Franchise," this occurs now with "peer-to-peer" payment systems in that these platforms all have their own bank accounts.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Technology does drive change, but it should not obscure the fundamentals of policy making in a democracy. The fundamentals are that we need a monetary system, free of special privilege, that serves all. We need a reliable, secure, and easily accessible payment system, but we do not need to optimize wealth accumulation by pandering to the needs of financial traders for ultrafast transactions.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Design principles to achieve the potential benefits of a CBDC are the following: A. In shifting to CBDC, money creation itself must shift entirely from commercial banks to the Fed or central bank, as detailed in Omarova's 2021 "The Peoples' Ledger," and Huber's 2017 "The case for a central-bank currency register"

(<https://sovereignmoney.site/how-to-account-for-sovereign-money>). The payment system must come to reside wholly in an institution that can offer the full faith and credit of the United States Government. The "tradeoff" here is that it will require a change in business plans for commercial banks, in which their lending will no longer be based on creating deposits, but will utilize pre-existing money coming into banks from savers as time deposits, or from investors, or from the Fed itself, if needed. B. The Fed or central bank must be enabled to fund the federal government directly with zero-interest loans—essentially grants if not actually sovereign money—issued either in perpetuity or with guaranteed, unlimited role-over privileges in order that government can meet public needs by spending (or giving, investing, or lending interest-free) in the public interest limited, not by money, but only by the availability of labor and of sustainably available raw materials. C. CBDC accounts must be free of interest payments and be available to all who participate legally in the nation's economy. Access to accounts must be easily and safely available through both private and public intermediaries, for instance through post offices, as suggested above, for those without internet service. FURTHER COMMENT: The definition of CBDC given in the 2nd paragraph of the Executive Summary and on p. 13 of the Fed paper "Money and Payments: the US Dollar in the Age of Digital Transformation" is inappropriate. It is an anachronism, a holdover from the age of gold-backed dollars; it does not describe a monetary system of fiat money. There is absolutely no justification for regarding CBDC as a liability of the central bank. Rather it is described properly as our social equity (Kumhof et al., 2020, [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3730608](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3730608)) or our liquid asset (Huber, 2017, cited above). These features of a monetary system, which can be utilized in or be the context for CBDC, were put in the form of legislation and introduced into Congress in 2011 as the National Emergency Employment Act (NEED Act, <https://www.congress.gov/bill/112th-congress/house-bill/2990>). The Alliance For Just Money (AFJM, [monetaryalliance.org](https://monetaryalliance.org)) has updated this legislation for 2022 as the American Monetary Reform Act (AMRA, available upon request, [reform@monetaryalliance.org](mailto:reform@monetaryalliance.org)). Finally, at AFJM's annual meeting in July 2020, the AFJM membership ratified a "Resolution on the Establishment of a National Commission of Inquiry Into the Monetary System of the United States of America" passed by our Board in March 2020 and first proposed in 1994 by renowned U.S. economist Dr. Hyman Minsky. This Resolution, including a link to Dr. Minsky's paper, are available at <https://www.monetaryalliance.org/resolution-number-one/>. AFJM continues to believe the US Monetary System is our most primary matter of public policy, and it warrants open, broad, public dialogue in the halls of Congress, in the state houses, county boards, city and town councils, and in the classrooms, community centers, and places of business across this country, including within the Board of Governors and the 12 FRBs of the Federal Reserve System. We would be at your service for fuller exploration of and collaboration on the ideas presented here. Thank you for your time and consideration. We look forward to hearing from you. ~Board of Directors, Alliance For Just Money, Inc., May 19, 2022

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*Name or Organization*

Sanjay Sharma

*Industry*

Individual

*Country*

India

*State*

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

“The Federal Reserve” will get benefitted in numerous ways : - Eliminate high Cost of Currency Printing. - Eliminate high Cost of disposal of soiled notes. - Zeroise the impact of Counterfeit Notes. - Remove cash as a medium of corruption; source for Black Money. - Remove high cost risk in Currency Transportation and Distribution. - Enforce various kind of cash transaction limits as per law. - Achieve 100% Financial inclusion. - Achieve 100% currency / payment digitisation. - Cash related crimes would be negligible. - Eliminate currency smuggling across borders and illegal transporting of money. - Strengthen anti-money laundering operations by removing element of Cash. CBDC-GULORI solution would enable “The Federal Reserve” to achieve all the above listed benefits.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

CBDC-GULORI solution would enable “The Federal Reserve” to achieve and maintain 100% financial inclusion at all the time.

*4. How might a U.S. CBDC affect the Federal Reserve’s ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public’s access to a form of central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Pls. refer the response submitted against question 20 & 22.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

CBDC deployment by "The United States" OR "The Federal Reserve" should be based on the merits rather than be guided through issuance of CBDC by other large economy nations.

"The Federal Reserve" has already seen the benefits of CBDC ( pls. refer response submitted against question – 1). Considering the benefits and inevitable nature of CBDC, it is important to expedite the decision, for comprehensive CBDC deployment.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Central Bank Digital Currency, it is evident that CBDC would be a solution based on digital technology. Therefore, CBDC being a digital solution, by default facilitate logging / recording of all transactions. CBDC-GULORI solution can be customised to support data privacy laws of US. CBDC-GULORI solution can - Log all transactions and transactions are visible to those two persons only. - Log all transactions and transactions are not-visible to even those two persons. - Logged transactions are getting uploaded into independent CBDC transactions repository, being maintained by The Federal Reserve / US Government only. Entire transaction history would be available for analysis and monitoring to designated authority by "The Federal Reserve" OR US Government. - In case US Laws do not permit to log CBDC transactions, it would be a plain vanilla type of digital currency solution.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

CBDC-GULORI solution, being a network independent and platform independent solution is immune from all kinds of cyber attack.

*14. Should a CBDC be legal tender?*

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

"The Federal Reserve" may recall that, as per best banking practices, cash / banknotes are primarily non-remunerative in nature. This means, banks are not liable to pay any interest on cash / currency notes held by customer / account holder. Therefore, CBDC balance should also be treated at par with cash / banknotes balance and hence it should be non-interest bearing. CBDC-GULORI solution would facilitate "The Federal Reserve" to maintain non-remunerative nature of cash / currency notes without stipulating changes in existing banking procedure.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

CBDC solution being a digital solution by nature, would enable "The Federal Reserve" to enforce various transaction limits e.g. -Daily Credit / Debit Transaction Limit -Only Debit Transactions Allowed -Only Credit Transactions Allowed - Max. Amount (Credit / Debit) per transaction\*\* "The Federal Reserve" would be able to enforce above limits using CBDC-GULORI solution through authorised bank(s) and their branch network. It would not be the responsibility of "The Federal Reserve" to directly maintain and supervise various types of limits. It may please be noted that various government(s) are finding extremely difficult to enforce cash transaction limits despite required rules / acts were pronounced time to time.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

"The Federal Reserve" is not required to involve / engage any intermediaries, when CBDC-GULORI solution is being used to provide CBDC services. "The Federal Reserve" would be able to provide CBDC services using existing infrastructure and setup.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

"The Federal Reserve" already achieved transformation of various payments into digital payments, using network centric solution through Bank(s) or other similar institutions. However, a breakthrough is yet to be achieved to transform all CASH TRANSACTIONS (especially person-to-person OR P2P cash transactions) into DIGITAL TRANSACTIONS in NETWORK INDEPENDENT ENVIRONMENT. In simple terms, "The Federal Reserve" need a solution / device to digitise all banknotes in circulation and facilitate "The Federal Reserve" to

stop printing of banknotes. It may please be observed that NETWORK INDEPENDENT nature of CBDC solution necessitates that CBDC must have "Offline Capabilities". CBDC-GULORI solution, provides complete offline capabilities to all account holder(s), to undertake CBDC transactions in network independent environment, without utilising any type of services from any network service providers.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

CBDC-GULORI solution is designed, keeping the needs of all category of users in consideration. Some of the important feature(s) and functionalities of the solution are: - Uneducated population would be able to use the solution. - Voice activated solution for physically challenged people. - No dependency on communication network. - Record and maintain all transactions for future tracking and monitoring. - Enabling The Federal Reserve to enforce transaction limit. - Finger print based / PIN based mechanism for secure usage. - Continue to recognize and respect "The Federal Reserve" as custodian of banknote(s).

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

"The Federal Reserve" may kindly note an important point about existing cash / currency notes – Transferability in physical form would be possible only when two party(s) would be in hand-shaking distance and no payment platform would be required. CBDC-GULORI solution in a similar manner, does not require any platform to achieve transferability. CBDC-GULORI uses near field communication features and standard financial message architecture to achieve transferability and undertake CBDC transactions between two entities. Thus, CBDC-GULORI is a completely platform independent solution.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

"The Federal Reserve" may kindly note that cash / currency notes transactions are mainly Person-To-Person (P2P) transactions. The main aim of any CBDC solution is to digitise P2P transactions. It may please be observed that all other types of transactions e.g. funds transfer between two accounts, programmable money, cross border payments etc. are already being taken care by existing core banking solutions having interface with different payment systems. Any CBDC solution provider, includes these feature in the solution, "The Federal Reserve" should consider this, an attempt to overload CBDC functions with already available core banking functions. Therefore, CBDC-GULORI solution focuses to provide P2P transactions and suggest that all other types of transactions, requiring network availability, should be performed using core banking or other solutions.

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*Name or Organization*

Neeraj Chawla

*Industry*

Individual

*Country*

United States of America

*State*

Washington

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

A US CBDC can be a great option and essentially an extension of the current US Federal Reserve and US monetary policy, where along with notes issued by Federal Reserve, a CBDC can be a new form of "legal tender". It can be a new medium of exchange of "legal" currency, in addition to coins and notes in circulation. In one aspect, the unique alphanumeric serial no. on the notes is similar to a cryptographic key of a CBDC. The digital wallet, blockchain, transmission, security and validation aspects may be new, that can also be applied to existing currency notes. However, a number of policy concerns and risks have not been considered in the CBDC paper, which are becoming evident in the current state of turmoil in the markets, and crypto mania that continues to add risks and uncertainty to financial markets. 1. Simplicity of monetary terminology. a. Terminology and financial concepts used should be simple and something the larger public can understand. It is not necessary that complex cryptographic concepts and algorithms will equate to a sound monetary policy, and in fact the opposite maybe true if the complexity of such instruments can be used by companies and individuals to take advantage of people, e.g. convincing them into speculative investments they don't understand. b. Most people can't differentiate between Credit and Debit Cards, and don't understand the variable interest rates and behavioral challenges of using such instruments that often put them into debt that they can't recover from. c. Similarly, CBDC and Crypto can be very dangerous terms that can be confused with each other, and innocent investors will not know the difference. d. Clear differentiation is needed, and legal laws to prevent manipulation that is rampant in Crypto market today. 2. Speculation in the name of innovation and decentralization needs to be avoided and eliminated, and "after the manipulation" regulation is not enough. a. Federal laws and policies should clearly make illegal to provide speculative information to non-accredited investors that is rampant in crypto markets. b. Federal laws should also make it illegal to invest public money from IPOs, 401Ks, and other institutional investors that are siphoning off billions and trillions off the public markets into speculative virtual currencies. c. Any such virtual or alternative currency information that promotes such speculative assets for its appreciation, store of value, etc., any such articles should be held to the highest standards of scrutiny by Federal Reserve and SEC, with significant penalties for violations. d. A digital currency should be designed to be stable, and there should be a single national currency, that is equal for all. e. Laws need to be enhanced to protect people against any speculative manipulations. f. Most people don't even understand what is crypto, but get enamored by the speculation which is driven by the crypto speculators and daily dose of speculative articles and statements, made without any action being taken against such misleading information. g. Young generation, schools and colleges, and especially financial institutions need to be educated for not falling prey to what they don't understand, and held accountable to not mislead a new generation of students and young minds, as they are the least experienced in understanding the risks and pitfalls of speculative currencies. h. Federal Reserve and other federal institutions should be chartered to evaluate and frequently report on the demographics of investors of such virtual currencies, regardless of whether CBDC is put in place or not. Reports on the numbers and types of accredited investors, what age-groups, demographics, and how are they getting manipulated into such schemes should be published. i. Crypto features designed to evade the monetary systems need to be eliminated. 3. Federal Reserve should clearly articulate what specific issues it aims to address, and goals that CBDC and such monetary instruments and policy aims to achieve. e.g. a. Eliminate speculative crypto currencies, and protecting investors from such speculative and unregulatable decentralized currencies, b. Create a regulatory framework for such

decentralized currencies, c. Creating a centralized US legal currency that eliminates need for other such speculative or decentralized currencies etc. d. Address fraud in the existing currency notes by replacing them with new and more secure form of legal currency.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Clearly, several of the potential benefits are related to the inefficiencies and high costs and manipulations built into the current financial systems, which need to be addressed. Also, many of the potential benefits the early adopters of crypto are seeking are unrelated to what CBDC or any currency can influence, and more driven by having good opportunities of investments, sustenance and growth. A sound policy for job creation, wealth distribution, and financial laws and regulations governing stock markets are the other ways of achieving the same benefits that are probably the fundamental drivers and issues that need to be addressed.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

A CBDC issued as legal tender by the Federal Reserve should be similar to current currency, and can be fairly accessible, and equally valuable for all users. Equitable structure favors inclusion, and does not position some early adopters in an advantageous position over other users. It should be a net positive compared to other alternatives in the markets.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

A US CBDC can successfully regulate and eliminate the misleading and illegal activities in the crypto markets, the net effect would not only be positive, the confidence in the financial markets should soar, which should lead to price-stability and maximum-employments.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Federal Reserve should evaluate how such a system will ultimately be used by general public, commercial markets, investors, and at what costs to the public and markets. That analysis will determine how the choices impact the financial stability. Assuming the concerns related to speculative crypto markets are addressed by CBDC, the net effect would be positive for financial stability of markets. a. What percentage of users are going to adopt a digital wallet, and in what time period? b. What are the true benefits common people will see while using it at the grocery store or in their checking, savings or digital wallet accounts? c. What are the incentives that can be offered, in terms of lower costs, higher interest rates, that can be sustainable over the long run? d. What will be the costs of enabling changes in the financial systems? e. How much speculation and investments will be poured into the markets due to lack of clear policy or regulation? f. Does it prevent and change the speculative nature of crypto markets and how does it impact the trillions that are being siphoned off the public markets?

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

The recent failure of some of the crypto stablecoins is clear evidence that there is a huge degree of speculation in crypto markets today. In the recent fallout of some of the crypto stablecoin currencies, an estimated \$60 Billion that was invested by the markets in 9 months evaporated in a few days. Overall, estimates over \$1 Trillion in speculative investments in Crypto markets are not only concerning, the future possibilities of even more speculative investments in crypto creates even bigger risks for the economy. A CBDC may negatively impact these speculative currencies, but majority of these are already expected to fail. In general, it should bring stability to the financial sector.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Most importantly tool is proactively coming up with laws and regulations, and timely implementation of policy, and not a wait and see approach often taken by the federal policy makers.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Cash usage is already a small percentage of overall digital money usage, and should not be a

major concern. The cash users are not going to be the early adopters, and cash can coexist with CBDC. Whether CBDC will even offer significant improvements in efficiencies over current inefficiencies in banks and financial institutions remains to be seen. How will CBDC treat transactions? Will there be fractional usage similar to cash and coins, or other mechanism will be needed. How does that impact the usage and adoption of CBDC? Hopefully, it will be much better than the confusion from complex new virtual currencies, which can be expected to be more detrimental for markets than the standardized, stable, and simpler and legal tender CBDC.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Digital payments are facilitated today domestically and cross-border in many different ways. A major concern is the high costs of currency conversions and fees charged by the banks, credit card companies, and other such financial institutions. Peer to peer crypto transactions aim to eliminate such overhead, but add other challenges such as money laundering, lack of accountability, and other illegal activities that are impossible to manage with the anonymous nature of such technologies. Why the transactional costs can not be reduced by better policies, regulation, competition, and oversight, is a subject that free market economists should address, instead of enabling large powerful interests to create new forms of currencies that evade the monetary systems, in the name of decentralization, and innovation. Money laundering in any form is not innovation, but a cost being passed on to public markets, directly or indirectly.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

CBDC and monetary policy have global impacts, and US should work in concert with leading countries decision to issue CBDCs. However, the world will also be influenced by clear leadership from US in addressing issues arising from crypto.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

An estimated \$1 Trillion has been siphoned off public markets into crypto schemes, and any delays in addressing these issues will only increase the exposure of public markets, and make any corrective actions more damaging to economy.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Just like privacy for digital transactions is enforced with laws and regulations, CBDC should be designed to safeguard privacy of information, but not create anonymity which creates huge risks of money laundering and illegal activities. Any schemes to create anonymity should be considered illegal activities, and penalties should be imposed by law.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

CBDC should be designed for ensuring accountability and ownership of money, and transactions. It does not need to be anonymous, or use blockchain or complex cryptographic algorithms for mining. What are the characteristics of a stable, national currency? By definition, it is a national currency, and a transact-able unit of money held by an owner. It should be stable, and hold its value over a long period of time, and not be subject to market ups and downs. Issuance of currency notes should be managed by a lawful process that ensures fair and just process for offering to investors, institutions, and public. In the CBDC context, much of these features should remain intact. Only the medium of issuance should be changing to digital. It can aim to address monetary policy problems and operational inefficiencies in the existing system and financial markets, but does not have to address such problems if they are unavoidable, nor should it be morphed into new concepts that create new risks in the financial markets.

*14. Should a CBDC be legal tender?*

Yes, CBDC should be a legal tender, like currency notes.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

A digital currency does not inherently pay interest. Interest is a separate function of banking

and financial markets. Such processes should be maintained. The process of adding interest by new instruments to attract investment is misleading public into believing they are sustainable policies.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

The benefits of creating such limits in a free-market economy are not clear. If there are inherent limitations on the currency issuance, some mechanisms to add such quantity limits could be considered for a period of time to understand the market behavior in usage of CBDC.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

First and foremost, the crypto schemes, and companies with crypto mining activities should be eliminated, and not be a part of CBDC intermediaries. Banking and financial institutions that currently act as custodians of digital currency can evolve into CBDC intermediaries. Regulatory frameworks should be inherently built into the design without a significant need for huge regulatory bodies. Initially, laws and regulatory frameworks will need to be developed, however CBDC should provide an opportunity for inherent accountability, ease of traceability for taxation and other monetary policy goals.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Ideally, yes. However, just like today's digital transactions require network connectivity, CBDC transactions can also have a similar model. However, some ability to do offline transactions would offer CBDC to be used similar to cash.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

One option is to make it very similar to current digital currency, and/or currency notes denominations. Also, making it easy to access CBDC based on biometrics in POS, so no additional wallets or cards are needed.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Yes, standards and guidelines for usage of CBDCs should be put in place.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

As much as possible, CBDC should be designed to be simple, and not be constantly changing, which brings uncertainties in the financial markets.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Some key design principles mentioned in Fed's paper need to be clarified. 1. What is CBDC, and why is it different from today's digital currency? Fed states "a CBDC would differ from existing digital money available to the general public because a CBDC would be a liability of the Federal Reserve, not of a commercial bank." Even today's digital money held in banks is insured by FDIC, the Federal Deposit Insurance Corporation. However, even if CBDC is a Federal Reserve liability, how different is it from today's digital currency? A run on any currency can be equally damaging to any system. When the banking system or federal reserve fails, it doesn't matter who takes liability, it is a catastrophic failure of financial markets. What is important in both systems is that there is a fair, transparent, and accountable system, that can not be manipulated by market forces to their advantage, and even when financial powers of the world will try to influence, arbitrage, and misuse the monetary system, there are safeguards that hold them accountable. For such a system to exist, Federal Reserve, and the Federal Government, along with other financial institutions such as SEC, collectively must have regulatory control, and that checks and balances are in place, and ownership and responsibility to maintain integrity of the system are clearly understood. If there is just a namesake CBDC under control of Federal Reserve, but there are many other decentralized and anonymous backers running crypto that Fed has little or no control over, that will be a huge problem regardless of whether CBDC is issued by the Fed. The damages to the system from the crypto mania engulfing the financial world under the name of

innovation can put the entire financial system at risk, and that's why having CBDC under federal reserve liability is a much better option. 2. Fed's paper states: "Cross-border payment currently face a number of challenges, including slow settlement, high fees, and limited accessibility. The sources of these frictions include the mechanics of currency exchange, variations in different countries' legal regimes and technological infrastructure, timezone complications, and coordination problems among intermediaries, including correspondent banks and nonbank financial service providers. Regulatory requirements related to money laundering and other illicit activities introduce further complications." How does CDBC address these problems? It's also important to consider how crypto and decentralized systems, under the name of innovation, are claiming to address these problems, but in fact are adding more regulatory complications. Time zone and other legal and financial differences between countries are going to remain with CBDC and crypto. In fact, new uncertainties are added to an already complex system, and money laundering is getting far worse. If the average cost of remittance from US to other countries is 5.41%, these issues need to be addressed in the international monetary systems, but not by creating work arounds the system, by creating decentralized, unregulated, anonymous, non-traceable systems that defy all logic of any manageable and controllable financial system.

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*Name or Organization*

*Industry*

Bank, Large (\$90 Billion or More in Assets)

*Country*

Japan

*State*

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

We have separately sent a comment letter by e-mail (to Digital-innovations@frb.gov) . Please kindly refer to the separate e-mail that contains our response to this discussion paper.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*
14. *Should a CBDC be legal tender?*
15. *Should a CBDC pay interest? If so, why and how? If not, why not?*
16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*
17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*
18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*
19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*
20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*
21. *How might future technological innovations affect design and policy choices related to CBDC?*
22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

AIMICHIA TECHNOLOGY CO., LTD.

*Industry*

Technology Company

*Country*

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*State*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

To increase efficient value transfer, integrate the automation technology of artificial intelligence with CBDC. If there is no risk management for AI technology in sensitive areas, once an uncontrollable error occurs, the system risk is difficult to assess.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

No comment.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

If low-income households are unable to own or study the digital economy, CBDC has no real impact on financial inclusion. Therefore, only by improving the basic digital capabilities of low-income households can CBDC have a certain effect.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

There are many variables in employment and price stability, and CBDC should not be used as a tool that can accomplish its goals.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

More observations and research are needed to determine how CBDC can affect financial stability. However, using CBDC to increase the efficiency of financial operations is one of the options.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

CBDC and stablecoins have a certain impact on the management of HQLA for financial institutions. They increase the cost of bank financing and the cost of credit to households and businesses.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

No comment.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Uncertain. If the cost of electronic payment is low and the popularity is high, CBDC may not necessarily be issued.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S.*

## CBDC?

The priority is to improve the efficiency of payment. For example, the time of cross-border payment can be realised T+0. Even, T+3 hours.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Because the world's main international settlement currency is the US dollar. Therefore, the policy impact of CBDC should be based on the United States.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

No comment.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

This can be achieved from the private key or credential management of the electronic wallet. For example, a specific unit authorized by the government to escrow additional private keys or credentials of consumers.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

No comment.

*14. Should a CBDC be legal tender?*

We agree.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

No interest is paid, just like cash. If interest needs to be paid, it will cause difficulties in accounting recognition.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Quantitative limits can be used to manage liquidity risks and prevent financial crime.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Banks, credit unions and insurance companies. These units have more experience in risk management than other units, and they are more willing to take risk appetites.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

If it is a trusted electronic wallet device, the CBDC of the wallet can be directly transferred to another trusted electronic wallet through the QR code.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Barrier-free and easy-to-understand guidelines can increase usage and acceptance.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

No comment.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

No comment.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential*

*benefits of a CBDC?*

No comment.

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*Name or Organization*

League of Southeastern Credit Unions

*Industry*

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*Country*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

A CBDC has the potential to provide a great many benefits to consumers and financial institutions across America. If designed properly, a CBDC could become a replacement for a lot of the infrastructure that currently exists within the financial space. If the CBDC can be made to be a more efficient way of transferring funds between financial institutions and for customers/members of a financial institution, then we could categorize it as an improvement to the system overall. When designing the CBDC, the Federal Reserve needs to address how it would be superior to the current wire system and how it could outcompete comparable cryptocurrencies or peer-to-peer ("P2P") financial apps, which have come to dominate money transfer space. Current cryptocurrencies and P2P services are going to pose the greatest risk to the mass adoption of a CBDC. Other than having the endorsement of the United States government, what benefit would this CBDC have compared to a similar stablecoin? There are stablecoins that are connected to all sorts of currencies and goods and a CBDC will be specifically trying to get into this market. Tether, one of the main stablecoin issuers, already has a dominate position in this marketplace with Tether coins that are pegged to the dollar and to gold. There are other stablecoin providers as well who allow for a great degree of anonymity, something a CBDC can not have by design due to Bank Secrecy Act regulations and the fact that any CBDC will necessarily have to be tied into the traditional financial space. Anonymity is a major selling point for cryptocurrencies in general, while cryptocurrencies built in the Bitcoin or Ethereum framework are too volatile to be a good means of transferring value. Stablecoins are more currency-like than their Bitcoin relatives as a way of fulfilling the original intention of cryptocurrency versus the reality of what cryptocurrency became, which is a vehicle for speculative investment. Stablecoins are filling this niche successfully at the moment, save for some concerns from the government on whether the issuer of the stablecoin has a sufficient amount of liquid reserves to maintain the peg. This is where a CBDC could outcompete a privately issued stablecoin. The Federal Reserve has a theoretically infinite balance sheet and as such could guarantee the peg of any CBDC to the dollar. The Fed needs to be prepared to back this peg fully in order for this coin to compete with the already existing stablecoins. In a sense, it is a trade off between anonymity and security. A privately issued stablecoin may give the buyer of that coin the anonymity they desire for their transaction, but they would not have the government backing to be certain that the peg will be maintained. P2P has become a major subsection of the financial space and has moved away from paper checks, wires and even the utilization of cash. When a member of a credit union or a customer of a bank can pull up their financial institution's app and have Zelle already downloaded, allowing them to send money without having to utilize any traditional financial tools, we can say that we are already moving rapidly into a new era of payment systems. A CBDC will need to compete with these P2P systems as well as the stablecoins discussed earlier. A solution for a possible CBDC to compete with these P2P systems would be resolved through ease of use. Most integrated P2P systems do have a basic sign-up process, even when operating within the app of a financial institution. If a financial institution is offering CBDC services to its members or customers, then having a wallet tied to the account from the moment it is opened would put a CBDC ahead of a P2P app as far as ease of use is concerned. The clearing of any transaction between two people utilizing a CBDC should also be faster than any other comparable services. A Bitcoin transfer can take anywhere from an hour to and hour and a half to complete. A CBDC should be transferred much quicker than that in order to be viable and competitive.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

The proposed CBDC would be specifically competing in the already existent stablecoin market, there are a variety of stablecoins available to the public pegged to a wide variety of assets. A CBDC will need to be better than all of its competitors to be the game changer that the Fed would like it to be. From our understanding of it, the Federal Government is exploring this CBDC mainly due to distrust around the existing CBDC companies and concerns regarding these companies' ability to maintain their cryptocurrency peg. Should the government decide against issuing a CBDC, it should consider the way it regulates the companies that have stablecoins on the market. Wider acceptance of a private stablecoin might be less burdensome to the administration while increasing access to financial resources as is desired with a CBDC. We are not saying that this is necessarily preferable to a CBDC, in fact, we feel that a CBDC would go a long way to legitimizing stablecoins as a whole and would be beneficial to the cryptocurrency ecosystem.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

According to the white paper on CBDCs, Money and Payments: The U.S. Dollar in the Age of Digital Transformation, "inclusion" is noted as one of the key reasons behind the creation of a CBDC. Depending on how the CBDC is designed, it could be a marginal net benefit for financial inclusion in the United States. We say marginal because many of the reasons that a digital asset is preferred over traditional banking is due to how easy it is to access and use them. This ease of use coupled with anonymity is the foundation upon which stablecoins are built. The white paper notes that about 5% of all U.S. households remain unbanked. We in the credit union industry strongly support adding these people to the financial system so that they can avoid many of the financial institutions that prey on the vulnerable like payday lenders and check cashing businesses. Outreach and education would probably be a more effective way of banking these individuals than a CBDC, if the CBDC is designed as an addition to the financial system as opposed to a more independent system. The Federal Reserve should consider this, any person can go to Bitcoin's website, create a wallet on their hard drive, and start accepting Bitcoin as a payment from that moment on. There is no know your customer/member ("KYC/M"), there is no Office of Foreign Asset Control ("OFAC") check, and there is no Bank Secrecy Act ("BSA") compliance involved. This comes back to the Libertarian roots of cryptocurrency, the individuals involved in the creation of these digital assets were extremely dubious on the reliability of the Fed and distrusted the government overall. As such, the design of Bitcoin and most other cryptocurrencies is centered around anonymity and independence. People who are not banked but are attracted to cryptocurrency would be turned off by a CBDC due to the regulatory requirements that go in hand with any financial tool created by the government. If a CBDC wallet is only available at a traditional financial institution and the financial institution has to collect personal information just like they would, to open a traditional account, then those who believe in cryptocurrency's original mission will not utilize it. Conversely, if the Fed was to set up a website where any person, banked or unbanked, could create a CBDC wallet and start trading in this hypothetical dollar pegged cryptocurrency, then the financial industry will be building a massive hole into its Anti-Money Laundering ("AML") defenses. We are supposing in the second scenario that CBDC wallets would be available at traditional financial institutions as well. In order to solve this conundrum, the Fed should look at a variety of solutions, ones that would provide access to this CBDC to as many people as possible, while reducing or eliminating the money laundering risk. For those who wish to utilize a CBDC but do not want to, or are unable to, become banked for whatever reason could have access to a CBDC wallet through the Fed's website, but that wallet should be limited based on what KYC/M information that person is willing to provide. While it may seem heretical to suggest this, but an anonymous CBDC wallet that is extremely limited in the amount of funds it can hold and the amount of value it can transfer would encourage some unbanked people to start using this financial ecosystem. This wallet may not allow for more than \$3,000 to be stored in it at one time, or it may limit the amount of CBDC that can be moved at one time to an amount even below that (\$500 for instance). Any sort of anonymous wallet would need to be designed with the purpose of making money laundering as slow and painful as possible. It is entirely possible that a CBDC will lead to a mass movement of unbanked people to the financial industry, we feel this scenario is improbable though, given the current environment around cryptocurrency. What is more likely is that a CBDC will improve the efficiency with which money is able to move within the financial industry. A CBDC may allow banked individuals to send money in a cheaper and quicker manner than writing a check or sending a wire. Overall, a CBDC might provide a slight improvement to the problem of financial inclusion in the U.S., however, we do not see it as being a game changer for this issue.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

A CBDC is unlikely to meaningfully impact the Fed's ability to implement its monetary policy goals. As long as the CBDC is being exchanged for dollars that already exist there should be no impact on inflation. A CBDC would also not be much easier than using a credit card to purchase goods and services and as such would likely not increase the velocity of money either. In the event of a recession, the Federal Government could utilize a CBDC to quickly get stimulus into the pockets of Americans, should the need for stimulus checks arise again. We also do not expect a CBDC to significantly impact the Fed's ability to meet its full employment target.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

A CBDC is unlikely to meaningfully affect financial stability. If designed properly, there should be no doubt as to the government's ability to maintain the peg of the CBDC to the dollar which is one key area of stablecoins that is the riskiest. Private companies do not control the dollar and as such it is a balancing act for them to maintain the peg of their stablecoin to the dollar, whereas the Fed can guarantee that peg forever. There is a risk that the system could be compromised by hackers on a grand scale, and this certainly could elevate the risk created by the CBDC that might not have otherwise existed. Strong passwords coupled with dual authentication to access a CBDC wallet is a method for mitigating this risk. The last risk we would like to touch on is one of the harder ones to predict. Exotic financial instruments created around a CBDC could destabilize its convertibility. Could a credit default swap ("CD") be paid out in CBDC? Could a major financial event lead to many of these CDs being called in leading to a large amount of CBDCs being transferred and converted to dollars? How would the Fed deal with this situation? These are all factors that need to be considered. A smart contract could hypothetically be created that uses CBDC that is immediately paid from one account to the another when the contract is fulfilled or terminated. Would a CBDC have an ability to be integrated to such a scheme? The ability of investors and other financial experts to take something that should be stable and bend it in such a way that they can make a profit is remarkable and the Fed will need to be prepared to contend with these possibilities.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

It is unlikely that a CBDC could adversely impact the financial sector aside from the risk that the peg might not be maintained. A CBDC would be unique in that it is designed with financial institutions in mind whereas the Stablecoins that are currently on the market were created by private companies who wanted to provide a way around the erratic price swings of cryptocurrency without using the traditional financial space. Stablecoins are not built into the traditional financial space and can only be accessed by intermediaries like Coinbase or Kraken, whereas a CBDC would be available without those intermediaries. We see a CBDC being able to increase the usage of cryptocurrency in America while posing a minimal risk to the consumer.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

The main adverse impact that we are concerned with is the potential for money laundering through a CBDC. This is also an area where the adoption of the CBDC could be hurt as there will need to be controls in place similar to a traditional bank or credit union account in order to combat potential money laundering. These requirements will reduce the number of individuals who might adopt the CBDC as those who are currently unbanked in America are likely so due to not meeting KYC/M rules and regulations. These rules against anonymity would also push away more conventional cryptocurrency users who value their privacy much more highly than the general public or are distrustful of the government in general. There are other elements to be considered too, such as how will the login system for this currency be designed? Will the login system be sufficiently secure to protect against hacking and other malicious actors? These problems, though, occur at the developer level, and while we have concerns about it we feel that a well designed coin will address them right from the start.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

We agree with the sentiment that some form of central bank currency needs to be available for payments even if the usage of cash declines. The number of transactions that are conducted in dollars has been on the decline for years. Credit and debit cards gave people access to the full funds of their bank accounts without needing to write checks or carry cash.

Couple this with the computerization of finance and we have a system where the amount of physical cash in the United States is, but a tiny fraction compared to the amount of money stored in the form of ones and zeroes. Comparing the current system with one that includes a possible CBDC does not lead us to believe that there is going to be a need to do away with paper money

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

We feel that cross-border and domestic payments will continue to evolve along the lines they have been for the last couple of decades. P2P will continue to dominate the transfer space while privately issued stablecoins will be utilized for the transfer of funds between people who desire to maintain their anonymity for certain transactions. Credit unions and banks will also continue to fulfill the role of issuing checks and sending wires for people who do not wish to utilize one of the newer FinTech systems.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The United States should look to see what other nations do, should those other nations choose to issue their own CBDC. While the United States is unique due to the size and complexity of its economy, we can still study how smaller nations handle the rollout of a CBDC. Of particular interest should be the rate of adoption that we see from these other countries. China, for instance, is also looking to issue its own CBDC while at the same time outlawing the mining of cryptocurrency. The data that China provides on economic and financial matters has been dubious at best for the last couple of years, but what we might be able to learn about adoption of a CBDC from China could be potentially valuable, if the Fed can parse the truth from the propaganda. Other factors should also be considered when analyzing another nation's launch of a CBDC, factors like access to the internet, electricity and the percentage of the population that is already banked will affect how the rate of adoption and utilization of a CBDC.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Many of the risks around a CBDC as were brought up in the paper and in this letter pertain to the possibility of it being used as a tool for money laundering and criminal financing. The amount of anonymity that the CBDC is willing to give to a potential user is directly correspondent to the degree to which it can be used for these criminal actions. There are also the technological risks that are posed to the CBDC from hackers and other elements looking to do harm or gain unlawful access to the CBDC system. Without a more in depth look at how this currency is going to be designed, what encryption method will be used, how it will be mined and stored, and a myriad of other technical elements, we cannot say with certainty what potential risks there are or how to mitigate those risks.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

It is unlikely that such a thing could be done. The Fed could state that the transactions in the CBDC ecosystem are not monitored by the government beyond what must be monitored according to regulation, such as with SARs and CTRs. The Fed could even say that it was designed to not let them monitor every transaction, the problem though, is that people who are concerned about this are also going to be disinclined to believe what the Fed is telling them. Many of the people who are interested in using a CBDC are going to initially view it as a novelty, those are going to be some of the very first adopters. The demographic that the Fed is trying to reach out to (cryptocurrency enthusiasts) do not trust the government enough to utilize a CBDC coin unless they can find a workaround for it to give themselves total privacy. They would also be dubious about using such a currency as they do not agree with the Federal Reserve's "money printing" as they would call it. The Fed stepping in during the recent crisis to buy up U.S. Treasuries and keep the government funded while Congress passed big spending packages like The American Rescue Plan and the CARES Act. These actions are largely blamed for the recent surge in inflation, as such, there is a deep distrust from certain elements of the public in the Federal Reserve and in the government's ability to manage the dollar. These problems are a bigger issue for the adoption of a CBDC than the ability to meet cryptocurrency advocates halfway on the issue of privacy

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

There is not one mention in the white paper as to how these coins are supposed to be mined, transmitted, or stored. Without these key details it is hard to give a definitive answer as to what risks are posed to a CBDC in the cyber space. Will the mining of these coins be done centrally by the Federal Reserve? Will they be stored in traditional cryptocurrency wallet like with Bitcoin? How will the password system to access these coins be set up? Will dual authentication be utilized to access these coins? The Fed needs to address these questions if they want to get a good reading on what risks are posed to a CBDC. If the Fed decides to mine or create these coins centrally, what protections will they put in place to ensure that their mining is not disturbed by bad actors? Will the Fed facilitate every transaction since they would be the miner and distributor of these coins? Alternatively, the Fed could allow the verification of transactions be done by financial institutions in exchange for a fee, much like how Bitcoin operates. In that case the Fed needs to consider how they would prevent a few large banks from forming a cartel around the facilitation of these transactions. There are simply too many questions around the design of this coin to give a definitive answer as to what risks are posed to it by the cyber space.

*14. Should a CBDC be legal tender?*

Any CBDC should be considered legal tender for several reasons. In line with the drive to make the adoption of this digital asset as attractive as possible, individuals that know that this CBDC will have the same status as a regular dollar will encourage people to utilize it and knowing that it is a safe way to hold and transfer value. Another avenue that would encourage the adoption of CBDC even further would be allowing for the payment of taxes with CBDC. This will further legitimize it in the public's eye and could allow for the quicker and easier payment of taxes or of tax refunds. This is something that would be up to the Treasury to decide, but if they are willing to work with the Fed on the creation of this coin, then we hope that they would work with the Fed on the adoption of this coin as legal tender on par with the dollar.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

We would not be opposed to a CBDC paying a moderate interest rate as that could encourage the adoption of the Stablecoin, there are several possible mechanisms to pay out this interest. The Fed could allow for the creation of CBDC savings accounts at depository institutions that would pay out interest in CBDC. The Fed could also have an interest payout scheme where the Fed pays the interest rate on CBDC accounts. This could be used as a way to add money to the system during times of recession. While we are uncertain of what legal limitations the Fed would have on engaging in this sort of scheme, it could act as a way of enticing people to use the CBDC and be a mechanism to help the Fed in its goal of stimulating the economy in a downturn. This interest rate could also be used to pull money out of the economy during periods of high inflation as a CBDC savings account with a higher than market rate of interest would draw in more people than a traditional savings account would. We are neutral on this matter, we would like depository institutions to be able to set up savings accounts using CBDC, but we would need to know more about how this cryptocurrency will work before we can give a definitive answer.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

A bank or credit union account has no limit on the amount of funds that can be deposited into it in theory. In practice it would not be advisable to deposit more than the \$250,000 that are insured by the Federal Deposit Insurance Corporation ("FDIC") or the National Credit Union Share Insurance Fund ("NCUSIF"). We would not support putting a limit on the amount of CBDC that can be deposited into a wallet, accept for unique circumstances that are mentioned elsewhere in this letter. If the Fed does decide to limit the amount that can be deposited into a single CBDC wallet, then we feel that the CBDC wallet should be insured just like a regular account would be and that limit be the same as what the insurance will cover. This will do two things to encourage adoption of this coin. First, it will give very rich Americans a place to park their money where it will be insured, and while that is not inline with the mission of financial inclusion that the Fed is putting this coin forward as, it would do a great deal for the wider adoption of this coin. Should the transmitting of these coins be easier than a wire then those very same rich individuals might use it for day-to-day transactions. The other thing that giving these wallets insurance will do is that it will give people a sense of security when converting funds into CBDC, knowing that their funds are insured just like their normal depository account will encourage them to utilize this new tool as well.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

We see an environment where credit unions, banks and MSBs are the main intermediaries for

a CBDC. A CBDC account should be very similar to a regular account at a bank or credit union in that the account must be compliant with BSA and KYC/M. This is necessary in order to preserve the safety and soundness of any CBDC system that is created by the Fed. All three of those entities are already regulated by either a federal body or a state regulatory agency and as such will be familiar with what information they need to collect for a CBDC account or will already have the information on hand if they are adding CBDC as a new service to existing accounts. There is also the possibility of one other entity being an intermediary for a CBDC, that being FinTech companies built around the CBDC or cryptocurrency in general. There are plenty of FinTech companies that are already built to cater to those who are interested in digital assets and as such have a unique interest in utilizing a possible CBDC. They would also have the technical knowhow to quickly add CBDC to their app or website, making them possibly the very first adopters of this cryptocurrency while more traditional financial institutions would need time to decide if they would want to participate and get the technical experts, they would need to access the system. Despite the slowness with which traditional financial institutions may have in regard to adopting a CBDC, we still feel that a CBDC should be more oriented towards them given the regulatory reasons noted earlier and because the traditional financial space remains much larger than the FinTech space in America. By designing the CBDC to fit well with traditional finance, the Fed will be giving it the best chance they can at mass adoption.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

If a CBDC is to have offline capabilities, then we would like to see those capabilities severely limited. The online element of the CBDC is going to be the main facet through which an AML program can be run. By giving the CBDC an offline capability, the ability to conduct AML will be severely limited. If two CBDC wallets could transfer funds without the internet, then it is possible that those transfer could be successfully hidden from the financial institution hosting the wallets. It might make sense that any wallets hosted completely within a single financial institution may have a capacity to transfer funds without the internet and then it is up to that financial institution to oversee the AML risk for that transfer. A better utilization of any sort of offline capability would be for emergency situations. Should a natural disaster strike an area, it might make sense for the Fed to allow the transfer of CBDC without the internet through some sort of prebuilt mechanism. Designing a CBDC that has an offline capability will be difficult for the Fed as the public ledger is the backbone upon which most cryptocurrency is built. The ledger would need to have some way of updating without the internet or the Fed would need to have a mechanism in place to find coins that may go missing when utilizing offline transaction capabilities. We think that having some sort of offline capability would be good but designing a CBDC around this one niche use case would be prohibitively complicated.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Ease of use for both merchants and financial institutions will be key for the mass adoption of CBDC in the U.S. Setting up a CBDC wallet for a merchant should be as easy as adding it to whatever account they have with a traditional financial institution, or they should be able to go to the Federal Reserve's website and be able to set up a wallet there. Merchants may end up utilizing CBDC in mass if the fee to transfer funds is comparable or less than a credit/debit card and the transaction can be cleared as quickly as a credit or debit card. Giving people more ways to pay for things will contribute to financial inclusion, not everyone can get a rewards credit card (one of the main drivers of the card industry today), as such, someone who wants a quick and easy way to pay for a good or services without using a check or debit card could use a CBDC. However, we do not think that this will replace card transactions entirely, our member credit unions have mentioned how popular rewards credit cards are with their members and it is unlikely that this could unseat those cards from their current dominance. Ease of use for both merchants and individuals is going to be a key element for the mass adoption of a CBDC.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

A CBDC should take elements from Bitcoin in this respect. Anyone who has a Bitcoin wallet can transact in Bitcoin. All it takes to do that is an internet connection and a storage medium to put the wallet on. While a CBDC can't be as simple as Bitcoin is to create a wallet, it should be simple for merchants, financial institutions and FinTech companies to plug a CBDC wallet into their apps and websites. This ease of use and necessarily self-contained system will allow for transferability across a wide range of platforms. The Fed can control who is able to create these wallets through a licensing scheme that will give them the power to allow certain institutions into this network. The Fed could also contract with a third-party vendor to give out

these licenses if they do not wish to control that process themselves. At a fundamental level, cryptocurrency is designed with integration into as many electronic systems as possible and a CBDC should consider how it would rework the ease of use to allow for as many individuals in institutions to use this currency as possible while minimizing the money laundering risk.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

A unique element of cryptocurrency is the computing arms race element. Bitcoin was designed to require more and more computing power to mine new coins, as such early miners of the coin became extremely wealthy as even a basic desktop computer could mine a few Bitcoin a day during the early period of Bitcoin's life. The actual mining of the coins has become much more difficult over the years as the algorithm that decides the difficulty has increased every few years. A regular desktop computer would likely only be able to mine a tiny fraction of a Bitcoin a day. The people who make money off Bitcoin mining at a large scale are those who have large mining operation that are optimized for that task. There are two problems that exist based on this design: what happens when over 50% of the mining operation is controlled by one miner or mining group, and what happens if someone builds a better computer. Bitcoin has a weakness that in that it is majority rules in regard to the verification of transactions. As part of the mining procedure, miners can also verify transactions for a fee and earn their Bitcoin that way. Since it is majority rules, there is a problem of what happens if a single entity has over 50% of the mining power in the network. If this happens, many actions that were thought impossible in the Bitcoin network become possible, such as being able to reverse transactions or move all the Bitcoin in the world to one wallet. A possible CBDC cannot have this same weakness. It is one thing if a group of private entities are mining Bitcoin as a means to make a profit. It is another if the coin is issued by the government and is mined by government computers. There are foreign actors who would have an interest in attacking that infrastructure or finding a way to undermine it. It could be as simple as finding a way to quietly add their own computers to the network until they have 50% control of the computing power in the network. They could then use that control to cause havoc with the CBDC. It isn't just foreign state actors that could cause this harm to the network, there is currently a race among private companies to build a new type of computer that could change the way we encrypt everything. Traditional computing, computers that use ones and zeroes, appears to be reaching the limits of computational power and speed. The gates that make up the ones and zeroes used to compute everything are getting so small that the principles of quantum mechanics is starting to interfere with the ability of these computers to function. This is where a new form of computing is coming about. The quantum computer is a computer that uses atoms as its ones and zeroes, but, because they use individual atoms, they also have a third state that is both one and zero. This interesting quirk of quantum computers makes them vastly more powerful than a comparable traditional computer. These machines are so much faster than traditional computers that they can easily break the encryption method that is used by most cryptocurrencies, SHA-256. The point at which these machines would be able to break the encryption of SHA-256 is around the one million qubit mark. The current largest quantum computer in the world is a 127-qubit machine built by IBM. It may seem like we are a long way from the million-qubit machine, but IBM plans on more than doubling the number of qubits every year with the goal of a 4,000-qubit machine by 2025. At that rate, a million-qubit machine could be a reality by the early 2030s. A CBDC that has its long-term viability in mind needs to be prepared for a world where a private company could have vastly more computing power than the government. This is the main future technology that we are concerned about, and the Fed should give some thought as to how to counter it.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

The Fed must make key choices between the privacy of an individual using the CBDC system and the risk that privacy poses to the wider financial system. There are more technical elements that the Fed did not raise in their white paper like would the coin be more like Bitcoin or more like Ethereum? What method of encryption will be used and what kind of log in protections would be utilized to ensure the safety and soundness of the system? The main tradeoff for having a more secure system is that the bar for entry is made much higher and the rate of adoption may be lower than desired. Which institutions will be able to use the CBDC system is another design element that the Fed will need to answer for. If it is just depository institutions then how will those institutions access the system, set up wallets for their members or customers and how will the transfer network between wallets work? There are numerous cryptocurrencies out there with different types of wallets and ways of transferring the coins, the Fed should carefully inspect some of the larger ones and see if that fits with the mission of a CBDC. There should be an emphasis on the speed with which a

transaction is cleared, people want their money as soon as a transaction is made and in the traditional financial world it can usually take 24-48 hours to clear most debit and credit card transactions. A CBDC would be highly competitive in this market as having the transfer of funds be almost instantaneous would be a major selling point for the utilization of the CBDC. At this point it is hard to give a definitive answer on design principles since we only know the goals of the coin but not how the Fed wishes to reach those goals in a definitive technical sense. With another white paper detailing the preliminary designs of a CBDC we would be able to give better and more in-depth feedback. We would like to thank the Federal Reserve for the opportunity to comment on this matter. If you would like to discuss this matter or our comments further, then please feel free to reach out to us.

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*Name or Organization*

Lex Futurus Group

*Industry*

Other: Law

*Country*

Nigeria

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

“additional potential benefits” i. Money printing production cost expenses reduction. CBDC has the potential benefit to avoid wastages and keep printing costs under control, or eliminate same. Central banks incur huge expenses printing and producing money for economic activities and consumption, and keeping sovereign economies afloat and operational. Per some sources including the US Fed. Res. Board itself, there are relevant costs for paper dollar money minting. A CBDC could potentially cut and reduce the United States dollar printing and production costs as a USD CBDC money supply cryptographic algorithm would only need be programmed based on the Federal Reserve Board monetary policy tool preferences, i.e. expansionary monetary policy, contractionary monetary etc. ii. Distribution, circulation, and enhanced digital money spending convenience. A CBDC would allow distribution and circulation enhancement, both in spending and transacting convenience for the reasons that technology is fast-becoming ubiquitous, and especially distributed ledger technology adoption on upward spiral growth trend. iii. Frictionless transaction operation Another additional CBDC potential benefit is frictionless transactional operation, and real-time transaction settlement and finality hitherto impossible with fiat paper money transaction payment guardrails. “policy considerations” Some of the other policy considerations not mentioned and discussed in the paper range from security, architecture, governance, smart contract policy to auditing: CBDC Security How sound and secure should US CBDC dollar be in terms of payment system infrastructure resilience? This is a threshold question. Though there are many CBDC design choices, the security consideration question permeates the length and breadth of all these different CBDC design choices. The security consideration questions encompasses factors like fraud, double spending, counterfeiting, Denial of Service (DoS) attack, Anti-Money Laundering(AML), Countering the Financing of Terrorism(CFT), financial system stability, consumer protection and the likes. Since Distributed Ledger Technology (DLT) solution is most often considered for CBDC implementation projects by sovereigns, there is every possibility that regular cryptocurrency distributed ledger cybersecurity and security consideration questions arise in the eventual CBDC operations. Thus, there are certain unique security benefits which could accrue to a US CBDC as a direct result of the cryptographic distributed ledger system implementation and leveraging for a USD CBDC. Some of these are: i. Single point of failure minimisation ii. Availability enhancement iii. Transaction record security strength enhancement via cryptographic hashes The security question ubiquity with CBDC implementation irrespective of the design choice technology adopted, is prerequisite for any CBDC implementation strategy effort. Though there are not many different security consideration questions between blockchain technology-based CBDC on one hand, and legacy monetary and financial systems i.e. incumbent payments systems, regular online banking, and related financial services on the other hand, the common legacy security questions that exist range from phishing attacks, malicious insider attack, malware attack (to obtain asset private keys for instance) to nation-state critical infrastructure espionage attack to mention a few. To forestall against these, and more, having in place a virile and resilient USD CBDC robust information security programme becomes imperative. CBDC Architecture The underlying system atop which a USD CBDC dollar would be implemented is a fundamental question yearning for consideration short term and long term both. Should the US dollar CBDC be implemented atop a blockchain architecture, or any other distributed ledger technology, i.e. Hedera Hashgraph etc.? Or should the USD CBDC leverage a distributed ledger system at all? What are the tradeoffs, if any, and why? To answer in the affirmative, almost all the sovereign nation-state central bank authority CBDC projects so far have leveraged one distributed

ledger system or another. Though a CBDC project can either be account-based or token-based, there are further retail CBDC and wholesale CBDC design principles as well. There are multiple combined CBDC design architecture questions liability, issuance, operational role, and record keeping to be considered. REFERENCES <https://www.postgrid.co.uk/reduce-printing-costs/> <https://www.investopedia.com/news/fed-will-print-more-50-bills-year/#:~:text=Printing%20a%20one%2Ddollar%20bill,because%20of%20fewer%20security%20features> [https://www.federalreserve.gov/faqs/currency\\_12771.htm](https://www.federalreserve.gov/faqs/currency_12771.htm) <https://www.sciencedirect.com/topics/computer-science/cryptographic-algorithm> <https://corporatefinanceinstitute.com/resources/knowledge/economics/contractionary-monetary-policy/> <https://www.federalreserve.gov/econres/notes/feds-notes/>

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

The potential benefits of a USD CBDC which have been identified thus: “Spurring innovation. ... Cross-border payments. ... Support the international role of the U.S. dollar. ... Financial inclusion. ... Extend public access to safe central bank money. ... Changes to financial-sector market structure. ... Safety and stability of the financial system.”. cannot be achieved in a different way, which leaves out CBDC as the latest technology iteration of, and innovation on money, and derivative finance as we know them. Though some of the potential benefits of CBDC can be achieved in different ways, all of the potential benefits of CBDC cannot be better achieved in a different way except through leveraging the blockchain technology money, payment, and finance platform use cases. The reasons for this are not far-fetched, and they are the main features and characteristics of the blockchain or distributed ledger technologies generally for instance, which introduce process efficiency gains, and specifically introduced money, payment and finance operation efficiency gains into the markets et al. Here below are some of these reasons the germane and pertinent ones: Real-time USD CBDC transaction data transparency Real-time USD CBDC transaction data accessibility USI CBDC transaction ease and data recognition USD CBDC transaction data distributed ledger cryptographic security assurance USD CBDC transaction data verifiability. REFERENCES <https://www.skadden.com/insights/publications/2022/02/the-federal-reserve-weighs-risks#back-to-top> <https://lexfuturus.io/wp-content/uploads/2019/09/CBN-PBoC-currency-swap-deal-and-the-blockchain.-Research-Paper-1.pdf>

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

A CBDC could have a far-reaching effect on financial inclusion, as it could enable sovereigns to lower the money and finance space entry barrier for the unbanked, and underbanked through the CBDC onboarding layers and requirements. More to the datapoint, technology-oriented financial services provision have led the charge globally to financially include the unbanked and underbanked. Per the World Bank financial inclusion data: “Financial inclusion means that individuals and businesses have access to useful and affordable financial products and services that meet their needs – transactions, payments, savings, credit and insurance – delivered in a responsible and sustainable way.”. A CBDC financial inclusion would have positive net effect since it would expand money and finance through an overall value chain digitisation process. REFERENCES <https://www.worldbank.org/en/topic/financialinclusion/overview#1> [https://www.researchgate.net/publication/356382835\\_Can\\_central\\_bank\\_digital\\_currency\\_increase\\_financial\\_inclusion\\_Arguments\\_for\\_and\\_against](https://www.researchgate.net/publication/356382835_Can_central_bank_digital_currency_increase_financial_inclusion_Arguments_for_and_against) <https://thefintechtimes.com/how-to-bank-the-unbanked/> <https://www.worldbank.org/en/topic/financialinclusion/overview#1>

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

A potential USD CBDC can enhance the U.S. Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals. For instance, the CBDC financial inclusion benefit factor, which has been critically and objectively identified, can prominently enhance the Federal Reserve monetary policy implementation ability, and engender attendant maximum employment and price stability in the process. More specifically, economic price stability could be potentially guaranteed through a centralised money supply blockchain cryptographic consensus algorithm, where price is programmed and controlled from the central source(though there is a potential central point of failure risk inherent), and thus its stability can be achieved and maintained. Further, since making an economy sustain full employment entails avoiding unwelcome inflation, a potential USD CBDC can be programmed to prevent inflation; imbued with anti-inflationary monetary and fiscal policy guides; blockchain/Distributed Ledger Technology(DLT)-based, and programmed with a fixed supply for a long period of time, so that economic growth without inflationary tendencies overtime can be guaranteed. Anti-inflationary fiscal policy

guides viz: government expenditures adjustments borrowing debt management policies taxation wage and price controls et al. can be programmed into the CBDC blockchain cryptographic distributed ledger code system. This is the same as the Bitcoin blockchain platform, whose monetary system value chain policies are embedded into the code itself. REFERENCES <https://www.imf.org/en/News/Articles/2021/11/15/na111621-five-observations-on-nigerias-central-bank-digital-currency> <https://www.google.com/amp/s/www.brookings.edu/blog/up-front/2022/02/23/how-does-the-fed-define-maximum-employment/amp/> <https://www.economicsdiscussion.net/fiscal-policy/anti-inflationary-fiscal-policy-economics/26178>

5. *How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability? Per CBDC financial stability implications report 2021 by the Bank for International Settlement(BIS) and a certain of central banks, a CBDC could affect financial stability in the following ways: Possible significant commercial bank deposits decline/Possibility of CBDC substitution for bank deposits. Aggregate reserves level reduction sufficient for pressure exertion on key market rates short-term. CBDC adoption influence on household sector balance sheets and incomes. Bank funding and lending implications. CBDC adoption possible systemic bank runs effects/abrupt money-market withdrawals. Pursuant to above consideration, a potential USD CBDC net effect would not be positive for financial stability, but rather negative for financial stability. Nonetheless, there are available, constructive optional safeguards (which could overall make a CBDC adoption net effect to be positive for financial stability, if introduced alongside), which the BIS financial stability report above mentioned also touched upon. These are: Central bank reserves supply adjustment for rate pressures stability. Measures to manage bank run risk. Quantity-based safeguards.

Price-based safeguards. REFERENCES <https://www.investopedia.com/terms/c/central-bank-digital-currency-cbdc.asp#:~:text=A%20CBDC%20also%20provides%20a,currencies%20in%20their%20current%20form> [https://www.bis.org/publ/othp42\\_fin\\_stab.pdf](https://www.bis.org/publ/othp42_fin_stab.pdf)

6. *Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Since a CBDC has no liquidity and credit risk issues, a CBDC is safe and stable value guaranteed within any jurisdictional legal tender law system better than any other exchange medium. A CBDC could have both national and cross-border adverse financial sector stability implications, but there are constructive, optional and complementary safeguards, as highlighted and discussed in #5 above. CBDCs generally are potential stable moneys, since they are sovereign-backed fiat currencies which have been around overtime, and have seen worse days, but still maintain their relative value and remain stable. CBDCs have different infrastructure, maintain different design choices from stablecoins, most of which at the moment are cryptocurrencies backed either by other cryptocurrencies, or in few cases, backed by the regular sovereign paper fiat moneys. CBDCs and stablecoins are going to affect the existing financial market infrastructures in ways profound. Though the jury is still out regarding how CBDC will affect the financial sector differently from stablecoins or other non-bank moneys, is almost certain that money and payment system efficiently, and financial inclusion short-term and long-term both are guaranteed..

REFERENCES <https://www.moneyandbanking.com/commentary/2022/2/27/comments-on-fed-cbdc-paper#:~:text=How%20might%20a%20CBDC%20affect,plunge%20in%20periods%20af%20strain>. <https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2351-c8c18bbd60.en.pdf> <https://www.mckinsey.com/industries/financial-services/our-insights/cbdc-and-stablecoins-early-coexistence-on-an-uncertain-road>

7. *What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

8. *If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*
12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*
13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*
14. *Should a CBDC be legal tender?*
15. *Should a CBDC pay interest? If so, why and how? If not, why not?*
16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*
17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*
18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*
19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*
20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*
21. *How might future technological innovations affect design and policy choices related to CBDC?*
22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

Oracle

*Industry*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Most of the benefits, policy considerations or risks have been largely outlined at length in the paper. The extent to which these risks outweigh benefits changes from central bank to central bank, considering that each of them have different goals towards rolling out a CBDC – some for financial inclusion purposes alone, some for promoting an alternative currency to reduce cost of physical currencies etc

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

As mentioned, some of the benefits need to be evaluated on a case-to-case and country to country basis. While the benefit derived from a centralized CBDC framework may apply to one country, it could be a completely different story for another country that is better off implementing a decentralized, node level framework, for instance. The benefits to the problems arising from a CBDC implementation have largely been addressed in the paper already

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

The key premise around financial inclusion is availability of financial services to individuals or businesses that are not part of the formal financial services net. Therefore, there need to be a couple of key framework and technology design elements for CBDC to positively affect financial inclusion efforts of various banks: 1. Recognition and inclusion of non-bank players such as fintechs, mobile service providers as part of the CBDC framework 2. Technology design framework that allows integration between mainstream banks, the central bank and non-bank financial service providers in the chosen design approach. Notwithstanding this, we believe that the effect of CBDC on financial inclusion would be largely positive owing to the recognition and availability of a central bank backed digital currency that can be made available to individuals irrespective of financial or non-financial channel availability

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

The CBDC, while not being the panacea, could be a very effective tool that assists the Fed's goals of effectively implementing monetary policy in the medium to long term. One of the most talked about aspects is the interest rate zero lower bound. It would simply eliminate the need for interest rates to be left at zero percent when it is unsustainable in certain scenarios such as in a deflationary scenario. Also, charging an interest on a CBDC allows a central bank to control interest rates more effectively. The availability of a CBDC in more hands would mean that no one would lend at less than a CBDC interest rate.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

In the event that a CBDC holding value or time period is not regulated, after a point of time when reasonable CBDC embracement has occurred, there is a possibility of a flight towards CBDCs away from traditional deposits at commercial banks and financial institutions. This could lead to the Fed needing to maintain a larger balance sheet in normal times than it

possibly does, while purchasing more from government and private securities. However, if any of these were to happen gradually and there are regulations in place for a CBDC holding value or time period for individuals and businesses, the long term effect could still be positive since there is a larger, more flexible legal tender that can be managed by the central bank

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

It is clear that if a CBDC were to achieve its intended state as an alternative legal tender or currency, there is bound to be disruption in the financial sector. There could be flight of capital from traditional deposits to CBDCs which could lead to massive amounts of liquidity requirements for banks to maintain deposits and interest rates, there could be potentially systemic risks for a few banks. But while this is being done, it is important that central banks identify risk areas for existing banks and financial institutions and address policy and regulation in the CBDC framework to safeguard some of these risks.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Any tools to counter the adverse impact of CBDC need to be complementary in nature and not at the cost of negatively affecting CBDC adoption. From an incumbent financial institution's perspective, some measures could include enhancing deposit insurance for individuals and businesses, strengthening banking and insurance regulation. From a CBDC perspective, some key measures to be considered could include limiting the number of transactions or value of transactions using CBDC, clearly defining permitted criteria for access to users

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

One of the biggest advantages offered by cash as a currency is anonymity in its usage. Apart from that, it is one of the most complex and difficult modes of legal tender that can be handled by a central bank, especially considering its printing, distribution, maintenance and replacement costs. There is a traditional segment of the population that always prefers cash and will continue to do so for the near future. Offering a CBDC as a digital alternative to cash alone would not help achieve the required adoption for this digital currency. The benefits of CBDC are far beyond that and pushing and defining policies for larger usage is a better option.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Domestic and cross-border digital payments continue to evolve rapidly across boundaries driven by complexities of regulation, security, privacy and adoption. Global payment standards bodies such as SWIFT and Fedwire are setting the standards in terms of digital payment regulations and guidelines. The emergence of ISO 20022 for payments is a game changer and expected to drive global adoption towards a common standard in payment transactions. The US CBDC, as envisaged at the moment, is an alternative digital currency to cash. The pace and quality of impact on domestic and cross border digital payments will entirely depend on the extent to which the shift is made from cash to CBDC and also to a larger extent on how CBDC is viewed as an alternative payment method to existing digital cryptocurrencies and digital payments.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Some factors that are worth considering and looking into are the benefits that most of these large economies are looking to reap from CBDC. Additionally, what are their data privacy and security regulations and how they are trying to fit in CBDC around this framework? What are the long term costs of moving to CBDC? Do they eventually outweigh the benefits? Is CBDC a sustainable long-term alternative to cash? These aspects need to be considered irrespective of whether the other large economies are going ahead or not with issuing CBDCs

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

None beyond those mentioned in the paper at this stage.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity*

*and facilitating illicit financial activity?*

While a CBDC system would require to comply with existing privacy norms the world over, a few basic aspects need to be considered in the design. The questions on privacy frequently center around what data is to be protected, from whom it needs to be protected and to what degree it needs to be protected. There is always a trade off to be made when payment systems capture increasingly personal information. It is clear that boundaries and policies need to be set for the extent of information that can be shared with each stakeholder within the payment value chain, for example data about the payment parties needs to be shielded from the issuer of the money, the payment network or service provider or any other non-relevant parties. Additionally, the CBDC system will need to leverage some of the upcoming developments in cyber security and cryptography such as layered data management in payment systems, offline smart cards etc. Evaluating and implementing these on a case to case basis may help alleviate some of the privacy concerns

**13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?**

We believe the future revolves around enhancing privacy of the individual for which various countries are taking concrete steps in defining and legislating guidelines around identifying and protective confidential data of individuals and businesses. The second aspect is around security of data with most countries mandating data residency norms for technology providers and financial institutions that handle this data. For a CBDC system design, the above two elements play a crucial role especially in a cross-border or multi-country transaction scenario. System design needs to be flexible enough to allow incorporation of country level data privacy laws through parameterization. Additionally, cloud based deployments across geographies that confirm to data residency norms also need to be thought through. These aspects would improve resiliency and make a CBDC system fairly future proof. A CBDC system may not necessarily be exposed any more operational or cyber risks apart from the risks associated with a centralized payment system including fraud and AML, infrastructure unavailability etc. These need to be addressed holistically through adoption of frameworks that have inbuilt resiliency and capabilities to handle these potential risks.

**14. Should a CBDC be legal tender?**

Yes, a CBDC needs to be a legal tender. Governments that are keen to adopt CBDC need to promulgate policies that recognize this as legal tender. In the absence of a legal backing, a CBDC is no different from a privately traded cryptocurrency.

**15. Should a CBDC pay interest? If so, why and how? If not, why not?**

To start with, a CBDC needs to be promoted as a mechanism for buying and selling goods and services and efforts need to be made to push it towards mainstream acceptance. A CBDC needs to pay interest since it needs to be incentivized for adoption and also be offered as a reliable alternative investment option apart from the traditional deposits in financial institutions. A prime example that comes to mind, by way of suggested promotion elements, include the Universal Payments Interface (UPI) in India that saw exponential adoption in a very short timeframe. It was first launched in 2016 after being piloted by the National Payments Corporation of India (NPCI) by 21 banks. Today it has evolved to being used by more than 164 banks. Today most banks have their UPI apps uploaded on Google Playstore. Banks believe that three things have been driving the widespread use of UPI – easy interface, two factor authentication and interoperability. The emergence of the pandemic also contributed to accelerating adoption of UPI in lieu of cash transactions

**16. Should the amount of CBDC held by a single end-user be subject to quantity limits?**

To some extent, there need to be checks and balances to the extent of CBDC held by a single end-user. This shouldn't be strictly quantifiable but a mix of qualitative criteria such as restricting CBDC transactions to certain categories alone – for instance, utility bill payments etc. Additionally, transaction limits can be set, for instance, a CBDC could only be used as legal tender for transaction values up to USD 1000.

**17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?**

The central bank needs to be the key authority that allows creation and maintenance of digital certifications for CBDCs. The primary intermediaries need to typically be accredited financial institutions and payment service providers that have a successful record of being in the lending and payments businesses for a significant amount of time. These primary

intermediaries need to be allowed to strictly operate within the regulatory confines of a CBDC framework. A certain proportion of reserves need to be maintained by the primary intermediaries at all times with the central banks and any breach of reserve limits needs to be replenished within a reasonable time frame. Moreover, ring fencing of liabilities against CBDC exchange values also could be considered

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Having offline capabilities for CBDC is critical to remove load from critical transactional systems that record and update the amount of legal tender being exchanged as well as accounting systems that need to maintain a record of CBDCs. Moreover, in geographies where a CBDC is being used to complement financial inclusion, an offline system is the best way to get around deficiencies in any technology or network connectivity infrastructure. The CBDC system needs to be designed to allow exchanges to take place up to a certain value limit in an asynchronous mode and logs or batches of all tanked transactions need to be maintained. Peer to peer offline payments should be encouraged and allowed to improve efficiency. Further, there needs to be a timeframe defined for the system to ping back the central CBDC network and refresh values of transaction logs and update the status of all transactions.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

The primary goals of CBDC are centered around reducing cost of distribution, improving access to financial products and services, irrespective of eventual adoption by various countries. CBDCs therefore need to be designed to eventually become one of the chosen mainstream methods of payment even at Point of Sale (POS). Integration or addition of CBDC method of payment to existing payment gateways both through traditional switch networks that handle POS settlements as well as the modern network payment gateways is one of the ways to achieve this.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

The global scenario when it comes to achieving interoperability among payment platforms starts with defining and implementing common minimum standards for messaging and processing among various payment platforms and schemes. A CBDC payment rail would also need to conform to some of these minimum standards to achieve transferability of interoperability. Global payment networks are transitioning to ISO 20022 to achieve significant economies of scale through common processing capabilities. While each networks interpretation of ISO 20022 varies, the standard framework of messages exists for network players to build upon. Some of these considerations would need to be built into the design of a CBDC payment rail.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

We believe the future revolves around enhancing privacy of the individual for which various countries are taking concrete steps in defining and legislating guidelines around identifying and protective confidential data of individuals and businesses. The second aspect is around security of data with most countries mandating data residency norms for technology providers and financial institutions that handle this data. For a CBDC system design, the above two elements play a crucial role especially in a cross-border or multi-country transaction scenario. System design needs to be flexible enough to allow incorporation of country level data privacy laws through parameterization. Additionally, cloud based deployments across geographies that conform to data residency norms also need to be thought through. These aspects would improve resiliency and make a CBDC system fairly future proof.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

At this stage, two of the most common design principles being considered: • The distributed ledger system which consists of a central authority responsible for issuing digital certificates pertaining to the CBDC and multiple intermediaries that act as nodes and are responsible for authorizing and validating the currencies across the network • The central system where a single authority is responsible for issuing, maintaining and managing digital certificates pertaining to each instance of the CBDC issued Obviously, at this stage and based on the experience of various central banks across the world, there is no single cookie cutter design

principle that fits a CBDC framework. There are inherent benefits and trade-offs associated with both the above design principles identified. As the market evolves, there are likely to be hybrid design models that combine the best of both these principles to suit individual country requirements. For instance, the digital certificate issuance and updation process could be completely centralized with a single authority while intermediaries are responsible for other associated functions around maintenance, tracking, infrastructure and network connectivity.

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*Name or Organization*

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*Industry*

Trade Organization

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The Federal Reserve's paper exploring the efficacy of a CBDC raises several prime concerns the credit union industry has with a centralized, digital currency. Mainly, the fact that a CBDC runs a significant risk of disrupting private banking; specifically, how a CBDC would affect the cost and availability of credit, the safety and stability of the financial system, and the efficacy of monetary policy. The Federal Reserve should withhold any final determinations until those issues are addressed. Additionally, if the CBDC is as efficient and widely used as posited, a CBDC would divert deposits from existing, brick and mortar, financial institutions to the Federal Reserve. Credit unions are committed, even formed, to serve the communities they are a part of, and deposits are necessary to fund personal and commercial lending. Specifically, if credit unions lose the regular inflow and outflow of account activity, members and communities may experience lesser access to capital and affordable and safe lending options. Lastly, it is more important than ever to ensure the United States' digital currency policy maintains the dollar's dominance and cultivates innovation while continuing to protect financial privacy. According to the Federal Reserve, 18% of U.S. households are either unbanked or underbanked. Of those underbanked individuals, privacy concerns and mistrust are often cited as reasons behind those Americans who are financially unbanked or underbanked. Any design framework for a CBDC would have to delicately balance the idea of personal data privacy and the need to combat and thwart financial crimes without further driving people to leave traditional banking. A CBDC originated and operated exclusively by the federal government would centralize large amounts of sensitive consumer data, raising concerns on data privacy and security.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Some, if not all, benefits of a CBDC could be achieved by empowering credit unions with digital currency custodian authorities. Credit unions already have the infrastructure and regulatory framework necessary to offer depository and payment services. An ambiguous patchwork of state laws, and unclear direction from federal and state regulators inhibits credit unions from leaping into digital currency. The National Credit Union Administration (NCUA) recently announced federal credit unions are authorized to establish third-party provider relationships to extend digital asset services to their members. This authority includes third-party provided services to allow federal credit union members to buy, sell, and hold uninsured digital assets with the third-party provider outside of the federal credit union; thus, rather than creating a novel government program to buy, sell, and hold digital currencies, grant credit unions the authority to do so. Rather than recreate programs currently thriving within the private market, the federal government should partner with established and well-regulated financial institutions, like credit unions, for increasing public access to CBDC opportunities.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

As stated above, OCUL is concerned that a CBDC could negatively affect financial inclusion. Specifically, the underserved, underbanked, and technologically challenged population could be further removed from safe, affordable banking. The digital age will continue to expand general access and opportunity but may further the technological divide for some populations.

A prime example of this is the current usage of remote banking. As of May 2021, mobile banking penetration has grown to 95% of Gen Zers, 91% of Millennials, 85% of Gen Xers, 60% of Baby Boomers, but only 27% of Seniors. This study shows that while one end of the generational spectrum is moving into the digital age at an overwhelming rate, the other end of that spectrum is slower to adopt technology. This trend of nearly 75% of seniors choosing more traditional banking options in lieu of digital or remote banking now exposes a potential generational gap that a CBDC might widen. On top of demographic considerations, banking deserts and areas without viable broadband access will be additional barriers to CBDC usage. Existing brick and mortar financial institutions will remain a necessary option for rural populations. Digitally migrating the financial services market could lead to financial exclusion for consumers who lack access or desire to participate. While there are real, tangible benefits that could stem from a well-run CBDC, OCUL cautions the Federal Reserve from marginalizing certain communities through exclusivity to digital currencies.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

At this time, OCUL has no response to this prompt.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Generally, cryptocurrency stability is unknown with noted, extreme volatility. Like any other currency, loan, or obligation, CBDC values should be expected to ebb and flow. However, with the extreme price fluctuations witnessed within existing digital currencies, the proposed CBDC framework would need to accommodate volatile values. In the event of a massive price shift, how will the current CBDC remain adequately capitalized? Additionally, Gresham's Law states that good money drives out bad, and vice versa. It is currently unclear how the introduction of a CBDC would interact with the current dollar or other decentralized cryptocurrencies. Creating competing currencies has a high likelihood of driving unnecessary competition, as well as opening the door to money laundering and illicit activities. As a result, financial unpredictability and uncertainty must be categorized as a net negative.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

The Federal Reserve recently stated that "a CBDC could also pose certain risks and would raise a variety of important policy questions, including how it might affect financial-sector market structure, the cost and availability of credit, the safety and stability of the financial system, and the efficacy of monetary policy." OCUL agrees with the Federal Reserve's identified risks and the related effects on the financial sector. More specifically, the adverse effects to the financial sector could manifest through a continued move away from traditional banking solutions. Banking privacy is a primary cause for people to leave traditional banking. Creating a digital federal banking system may further add to this fear. Credit union members will be concerned about the government housing all their financial data with a CBDC as more recently revealed in a proposed IRS transaction reporting requirement. Additionally, a shift to CBDC financial system could take necessary capital away from existing financial institutions. When consumers begin moving cash, savings, and investments into a CBDC, private financial institutions will have less liquidity for lending activities. Credit unions' main purpose is to serve local communities, and without adequate capital at their disposal, credit unions lose the ability to help people, families, and businesses thrive. Lastly, a CBDC must have significant privacy safeguards without limiting the private financial sector. As this paper suggests, a thriving CBDC allows transactions to flow freely and in real time. There must be data privacy and security mechanisms designed and implemented for each consumer. OCUL believes strong cyber security standards are necessary to protect consumers and their partner entities, or credit unions. Credit unions and other financial services entities are already subjected to the Gramm-Leach-Bliley Act and have the infrastructure in place to protect consumer data. Empowering current providers to extend cryptocurrencies as an intermediary, specifically financial institutions, would better ensure data security and privacy.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

At this time, OCUL has no response to this prompt.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

OCUL believes cash, or tangible currency, will always play a role for entire generations of our

population. The push forward into a faster, safer, and digital financial system is generally a positive development for the system, however, the need to preserve a physical form of money is paramount to financial inclusion. Whether it is a personal choice, generational trend, or a business decision, the use of physical money will be necessary to a complete financial marketplace.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

At this time, OCUL has no response to this prompt.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

At this time, OCUL has no response to this prompt.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

At this time, OCUL has no response to this prompt.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

The most efficient way to ensure consumer privacy without fostering illicit financial activity is to operate any CBDC through existing financial institutions. Credit unions deploy Bank Secrecy Act (BSA) and Anti-Money Laundering (AML) programs to capture illicit or suspicious activity for FinCEN oversight; therefore, the consumer privacy concerns would not extend beyond normal banking activity if a CBDC is operating through BSA/AML compliant institutions. By empowering credit unions as CBDC custodians, existing BSA/AML channels be used to ensure consumer privacy, as well as safety and soundness of the financial market.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

At this time, OCUL has no response to this prompt.

*14. Should a CBDC be legal tender?*

Any permanent CBDC, assuming volatility can be controlled, should be a viable, legal tender. If the goal is widespread, efficient access and use, making a CBDC a legal tender is the only outcome suitable. Having a cryptocurrency-style dollar, backed by the full faith of the federal government, allows a CBDC to become a more normalized, trusted currency. Anything other than being a full-fledged legal tender would render the CBDC unnecessary, and harmful to the financial market without apparent positives. However, the simplest option for successful execution of a CBDC still remains in existing financial institutions. While the CBDC being a legal tender is necessarily tied to its ultimate success, allowing financial institutions to be its custodians will ensure its widespread, trusted usage.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

At this time, OCUL has no response to this prompt.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

At this time, OCUL has no response to this prompt.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Simply, the existing, heavily regulated financial institutions that are already in place should serve as intermediaries. If given the necessary authority and regulatory framework, credit unions are a prime candidate to serve as CBDC intermediaries. A credit union's role would be to do what it already does best: serve people, families, communities, and businesses with safe and reliable financial access. A digital currency, or CBDC in an intermediary capacity, would be another service option that a credit union could offer to its interested members. As stated above, federal credit unions already can partner with cryptocurrency platforms; thus, a digital currency is already within a credit unions' capabilities. Moreover, the credit unions' role would be to act as a neutral third party in these transactions. As the Federal Reserve has

repeatably identified, consumer privacy is vitally important to the success of the CBDC. Thus, allowing trusted financial institutions, or credit unions, to serve as intermediaries puts a buffer between unnecessary additional government monitoring and consumer financial decisions.

Lastly, the current financial regulatory structure for a CBDC is already in place. Credit unions are already regulated by the National Credit Union Administration (NCUA) and Consumer Financial Protection Bureau (CFPB) at the federal level, and even more entities at the state level. Should a CBDC be put under a new financial regulatory scheme, it opens the door to conflicting regulations for what ultimately amounts to be the same currency, albeit different mediums. Existing financial institutions demand regulatory parity, clear and conspicuous laws, and predictable regulations, and the CBDC should be no different.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

At this time, OCUL has no response to this prompt.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes, to be successful, any CBDC design should make ease of use a primary focus. If the CBDC serves as legal tender, it needs to be as efficient and acceptable as every other form of currency currently in the marketplace. A CBDC would need to operate and function like every other form of currency at the point of sale, or its widespread usage will suffer. Credit unions constantly seek out experience efficiencies, so comparatively, a CBDC would need to be designed to keep pace with the constantly changing and evolving financial payments market.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

At this time, OCUL has no response to this prompt.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

At this time, OCUL has no response to this prompt.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

At this time, OCUL has no response to this prompt.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

GLEIF is not able to provide a response.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

GLEIF is not able to provide a response.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

GLEIF is not able to provide a response.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

GLEIF is not able to provide a response.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

GLEIF is not able to provide a response.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

GLEIF is not able to provide a response.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

GLEIF is not able to provide a response.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

GLEIF is not able to provide a response.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

GLEIF is not able to provide a response.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

GLEIF is not able to provide a response.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

GLEIF is not able to provide a response.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

GLEIF is not able to provide a response.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

GLEIF is not able to provide a response.

*14. Should a CBDC be legal tender?*

GLEIF is not able to provide a response.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

GLEIF is not able to provide a response.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

GLEIF is not able to provide a response.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

GLEIF is not able to provide a response.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

GLEIF is not able to provide a response.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

GLEIF is not able to provide a response.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Established by the Financial Stability Board in June 2014 under the mission of improving financial stability and transparency due to the aftermath of the financial crisis, the Global LEI Foundation (GLEIF) is tasked to support the implementation and use of the Legal Entity Identifier (LEI). Even though the primary and initial usage and adoption of the LEI was around financial markets and financial instruments, the LEI is use agnostic and therefore has been embraced by different industry sectors and regulators since its introduction by the Regulatory Oversight Committee, which includes the Federal Reserve Board, and the Financial Stability Board in 2012. Further details on the use of the LEI in regulatory initiatives is provided here: <https://www.gleif.org/en/lei-solutions/regulatory-use-of-the-lei> The LEI is the only global standard for legal entity identification. There are innumerable national or regional standards for entity identification across the world. Different identifiers might serve national needs; however, these differences create conflicts and inefficiencies when it comes to the reconciliation of data across borders. Therefore, the LEI responds to the critical need for a universal system of identifying entities across markets, products, and regions. The LEI connects to key reference data that enables clear and unique identification of legal entities participating in financial transactions, while also providing free access to verify parties to transactions, including in payments. GLEIF recommends that the design of a CBDC should include the LEI to identify each party involved in a CBDC transaction. The inclusion of the LEI would allow the Board, Reserve Banks, and payment platforms to know the legal entities behind each party in the payment messages through the use of richer, structured data. The Inclusion of the LEI could improve interoperability between the Board and other future CBDC payments systems. The LEI would also be the key to achieving real time settlement. In a recent interview, Merlin Dowse of J.P Morgan sums it up best "Corporates have to connect with multiple providers, each of which issues them with a client reference number that is meaningless outside of that provider's system. Every time they interact with a third party, they

have to share their information again. Reducing all of this to one unique identifier in the shape of the LEI allows for interoperability across networks and removes friction, saving time and costs.” Lastly, ISO 20022 is driving the inclusion of LEIs in payment messages as it becomes the global standard language for financial transactions. Within five years, ISO 20022 is expected to be the main language for payments. Many experts believe that ISO 20022 will be beneficial for CBDCs by standardizing the communication instructions for electronic payments within CBDC technologies, which promotes interoperability and makes the LEI more accessible for CBDCs.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

GLEIF has developed a fully digitized LEI service capable of enabling instant and automated identity verification between counter-parties operating across all industry sectors, globally. GLEIF invited stakeholders from across the digital economy to engage in a cross-industry development program to create an ecosystem and credential governance framework, together with a technical supporting infrastructure, for a verifiable LEI (vLEI), a digitally verifiable credential containing the LEI. See <https://www.gleif.org/en/lei-solutions/gleifs-digital-strategy-for-the-lei/introducing-the-verifiable-lei-vlei> The vLEI will give government organizations, companies, and other legal entities worldwide the capacity to use non-repudiable identification data pertaining to their legal status, ownership structure, authorized representatives, and employees in a growing number of digital business activities. This includes approving business transactions and contracts, onboarding customers, transaction within import/export and supply chain business networks and submitting regulatory filings and reports. GLEIF already is engaged in research partnerships and technical trials with stakeholders across the pharmaceutical, healthcare, telecom, automotive and financial services sectors. The credentials in the vLEI Trust Chain are chained to each other as vLEIs are Authentic Chained Data Container (ACDC) credentials. This allows for the provenance of vLEIs to be traced back to GLEIF as both the Root of Trust for the vLEI Trust Chain as well as the entity that ensures that operational integrity of the Global LEI System. The vLEI infrastructure is a network-of-networks of true universality and portability, developed using the Key Event Receipt Infrastructure (KERI) protocol, along with other supporting technical specifications. The infrastructure will support the full range of blockchain, self-sovereign identity and other decentralized key management platforms. vLEIs will be hostable on both ledgers and cloud infrastructure supporting both the decentralization of ledgers plus the control and performance of cloud. Portability will enable GLEIF's vLEI ecosystem to unify all ledger-based ecosystems that support the vLEI. One example of supporting technical capabilities is the above mentioned chaining of credentials. The vLEI infrastructure can support approving business transactions and contracts, onboarding customers, transactions within import/export and supply chain business networks and submitting regulatory filings and reports, signed in whole or in part by one or more persons representing their organizations (the multi-sig feature). Combining these two new features within the infrastructure takes the level of security to a new level for both the identification and verification of the credentials.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

GLEIF is not able to provide a response.

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*Name or Organization*

*Industry*

Bank, Large (\$90 Billion or More in Assets)

*Country*

United Kingdom of Great Britain and Northern Ireland

*State*

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The Fed paper outlines well what the vast majority of central banks around the world engaged on this topic, and HSBC, believe to be the main policy considerations, benefits and risks of a retail CBDC. Ultimately, the most important element to the success of any CBDC is trust. As the discussion paper mentions, a U.S. CBDC would be the safest digital asset available to the general public because it would be a digital liability of the Federal Reserve, free from liquidity and credit risk. It is critical that the public trust all forms of available money, whether digital or not, so that they may be used in confidence for daily transactions and as a store of value.

Existing digital money and associated infrastructure brings real benefits to the public. Consumers are increasingly able to transact from anywhere, at any time, using mobile phones and existing payment infrastructure such as the RTP network and the forthcoming FedNow Service. Improvements to critical US payment infrastructure, such as Fedwire, have already been planned. These improvements have, and will bring, real benefits, and offer the potential for further innovation, in terms of transaction speed, efficiency and settlement finality. All of these benefits are being achieved while maintaining full public trust in money. This balance of realising tangible benefits through innovation, while retaining full public confidence, should be maintained for any U.S. CBDC, and we believe that the tangible benefits of a U.S. CBDC should be specifically identified, over and above existing and planned improvements. People interact with commercial banks and commercial bank money daily. It is likely that the majority of the public is not aware that existing digital money is commercial bank, rather than central bank, money. It can be reasonably inferred that most people trust private money either because they do not understand the difference between private and public money, or else see no practical difference. The stability of money represents the practical reality of financial stability for most people rather than the technical infrastructure of central bank money, financial regulation and other tools that keep the relevant institutions safe. We believe that the public perception of any changes to money, and the confidence that this creates, will be critical. In all circumstances, we believe that a healthy and resilient financial system will require the presence of both commercial and central bank money. We therefore support the view that the optimal CBDC model for building trust is an intermediated design, due to its basis in partnership between central banks and authorised financial intermediaries. If designed well, CBDCs offer the possibility of faster and lower cost payments for consumers and businesses and could drive other innovations, such as programmable transfers to consumers and smart contracts to stimulate demand. They could improve identity and verification and security while respecting privacy, and enable business growth and investment. Furthermore, if designed well, CBDCs would also not incur the energy costs of some other digital assets. In addition to the risks raised in the discussion paper, we also think that the potential impact of dependencies on wholesale markets requires careful thought. The replacement of commercial deposits with wholesale funding could lead to a number of undesirable consequences. If the cost of wholesale funding compared to commercial deposits is higher, there would be cost of credit implications. It could lead to less diversification of funding or increased concentration risk for bank liabilities, increased refinancing risk due to reduced market windows, and increased exposure to market volatility. Market capacity is also a factor and increased dependency on less stable investor bases may exacerbate exposure to market conditions and thus refinancing risk. These concerns align to the Fed's previous analysis regarding the significance of the risks presented if a CBDC were pursued. In particular, we think it vital to consider carefully the effect on aggregate credit provision due to the potential loss of bank deposits.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

As noted above, the specific benefits that CBDCs can deliver compared with the benefits from improving existing transfer approaches will need to be defined carefully. The paper references the already considerable ongoing work and investment by the industry and authorities in the U.S. to redesign and improve retail and interbank payment systems, namely the RTP network and the interbank FedNow Service, which will enable 24/7/365 payments. The required investment and change across the industry to adopt a retail CBDC will also need to be considered. As the paper also notes, there are remaining challenges for the U.S. payment system, such as the speed and cost of cross-border payments. We do believe that CBDCs may represent an important technological opportunity to resolve key issues in these areas. The principal potential benefit is near instantaneous payment. Many financial transactions can be thought of as 'delivery vs. payment'. Delivery is a transfer of ownership of the asset while payment goes in the opposite direction. Distributed Ledger Technology allows a secure, certain and near instant transfer of delivery, but this is of limited value unless you can also process the related payment in a similar manner. CBDCs have the potential to further this goal. Near instantaneous secure and certain payments and other transactions can reduce the number of intermediaries (and associated potential risks) involved in payment chains, reduce settlement risk, resolve issues related to time zone differences and reduce transaction costs. These benefits could be passed along to consumers. Well-designed CBDCs could ensure that this is all done in a manner that corresponds with existing approaches to tackling financial crime. There are continuing global efforts, notably by the Committee on Payments and Markets Infrastructure (CPMI), to enhance existing cross border payments infrastructure. This multiyear global effort aims to tackle identified frictions in order to enhance cross-border payments. These frictions include: fragmented data standards or lack of interoperability; complexities in meeting compliance requirements, including for anti-money laundering and countering the financing of terrorism (AML/CFT), and data protection purposes; different operating hours across different time zones; and outdated legacy technology platforms. HSBC is closely involved in discussing these developments with policy makers, and we are working to support improvements to the existing cross border payments regime.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

It is not clear how or whether a CBDC could help those that remain 'unbanked', or whether it is best-placed to do so in comparison to existing initiatives. As the discussion paper mentions, the private sector 'Bank On' initiative already promotes low-cost consumer checking accounts. Some claim that a CBDC with offline capabilities and which is mobile friendly might drive financial inclusion. This claim and others should be subject to evidence, and reference research regarding the factors that prevent some consumers accessing bank accounts, and others declining to do so. Others, citing examples in very small developed economies, have claimed that a direct CBDC could help drive bank inclusion, but, in fact, direct CBDCs have only been adopted or proposed in economies that have relatively under-developed banking systems. They have not been proposed seriously for any advanced economy, and even major emerging markets have so far declined to create direct CBDCs. We do not think that a direct CBDC is an appropriate approach for the U.S.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

The introduction of a CBDC could have an impact on the range and effectiveness of a number of monetary policy measures, and also a broader impact on markets. A CBDC should be designed so that it does not negatively impact the ability of the Fed to ensure financial stability and guide the positive development of the U.S. economy. We believe this may be possible but more research is needed to confirm the appropriate design considerations, as described below. We believe that an interest-bearing CBDC should be avoided, as it would likely encourage a loss of bank deposits, which could threaten financial stability and wider economic growth. The October 2020 paper 'Central Bank Digital Currencies: foundational principles and core features', by the Fed and a number of other leading central banks, states that an interest-bearing CBDC would create financial stability trade-offs and that more research is required in this area if such a possibility were to ever be considered. The CPMI has noted that greater demand for CBDCs could affect repo and government bill markets and also reduce interbank activity. CBDC design choices could therefore have broader implications for the role of central banks in financial markets and monetary policy transmission mechanisms. These need to be carefully considered, and extending the Fed's work to consider these impacts in more detail would be an important step. There is also the possibility that CBDCs could extend the range of policy options available to central banks and governments, via programmable money, or direct, and potentially conditional, fiscal transfers to citizens. Careful consideration must be given to questions of privacy and freedom of action, as well as determining whether new approaches would offer clear benefits over and above

the approaches that have been used in some countries, including the U.S., during the COVID-19 pandemic. We recommend that a 'do no harm' principle, as put forward by the BIS in the report on CBDC principles cited above, should be applied, so that the risks associated with a CBDC are fully considered before implementation. CBDC implementation requires a fuller understanding of how consumers and the financial markets would react to digital money before a CBDC can be issued in confidence.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

As the discussion paper indicates, there are trade-offs that must be considered fully. This includes the impact of a U.S. CBDC on financial stability both domestically and globally. The latter is important for the dollar's continuing status as the primary global reserve currency. As mentioned in our answer to question 1, state-backed CBDCs certainly offer the potential to be more robust, transparent, stable and less risky than private digital currencies, such as stablecoins and cryptocurrencies. The introduction of CBDCs may help counter the adoption of these riskier assets. Yet the behaviour of consumers in situations of general economic stress is a vital factor. We agree with the Fed that any 'flight to safety' from commercial to central banks that CBDCs could encourage might present or exacerbate liquidity issues for financial institutions and pose risks to the operation of markets and to financial stability. It is therefore vital that new forms of digital money do not lead to 'digital bank runs'. Any CBDC that is interest-bearing could have a significant impact on the creation of money in the economy. It would likely reduce the amount of available funding for commercial banks and some banks may choose to compete to protect deposits by offering higher interest rates in order to influence consumer behaviour. They may do this based on the economic trade-off between raising rates versus raising expensive and inherently riskier wholesale funding. Such a dynamic is undesirable for financial stability and credit provision. It is for these reasons that we believe an interest-bearing CBDC should be avoided. As noted in the discussion paper, additional measures to protect financial stability could potentially include introducing limits to the amount of CBDC held by any end-user. A U.S. CBDC could have a significant global impact, given the USD's continuing global primacy. Careful consideration should be given to the design of a U.S. CBDC so that it does not negatively impact global efforts to reduce financial crime, in which the U.S. continues to play a leading role. The Fed may also wish to consider whether a U.S. CBDC would materially increase the degree of offshore USD deposits, and what impacts this would have on the U.S. and global economies, and the Fed's associated management of the USD both domestically and internationally.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

As mentioned in our answers to previous questions, depending on the CBDC design, there are a number of potential impacts on the financial sector to consider when developing a CBDC. Benefits and risks both need to be considered carefully. The introduction of new forms of digital money, including a U.S. CBDC, may improve the range of transaction services provided to the public. However, depending on the design choice made, some forms of digital money may reduce the overall efficiency of credit provision in the economy. Any aggregate increase in the cost of credit as a result of a policy decision in relation to new forms of digital money could have serious economic and social consequences, which could in turn undermine trust and confidence in authorities and the financial system they oversee. The risks to financial stability are not just applicable to commercial banks but also systemic stablecoin issuers, where a rapid loss of consumer confidence triggering a material liquidation of the backing assets could have impacts for financial markets. As the financial system rapidly evolves towards a more digital environment, it is critical that regulatory regimes encompass the full scope of digital money instruments to ensure the safety and stability of the financial system. This should certainly include stablecoins, and we particularly note and support the conclusions of the 2021 President's Working Group on Stablecoins. As the FSB noted in their October 2020 report on stablecoins, authorities agree on the need to apply supervisory and oversight capabilities and practices under the 'same business, same risk, same rules' principle. We think that proper regulation of stablecoins will be a critical component of a safe regulatory regime governing the new and evolving forms of digital money.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

The discussion paper has set out the potential benefits and adverse impacts of a retail CBDC. As mentioned previously, we agree that an intermediated CBDC model is the most promising and could provide effective public access to central bank money in a digital world. It is the most similar to current market structure, with its basis in partnership between central banks and financial intermediaries and seems to us, and to many other commentators and

authorities, to be on balance the most promising option under consideration. Nevertheless, there are still substantial risks associated with this model. In particular, this includes potentially significant impacts on commercial deposits – with subsequent impacts on the supply of credit, financial markets activity and overall financial stability – that could develop very rapidly. The trade-off between the anonymity provided by cash, and potentially a CBDC depending on the design choices made related to anonymity, and the requirement to ensure high standards of AML/CFT must also be considered carefully. Some of the potential negative impacts could be mitigated by avoiding an interest-bearing CBDC and introducing withdrawal caps on commercial deposits, although the latter needs to be considered carefully and tested.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

We think it is critical that, even as new forms of digital money are introduced, cash remains available for so long as there is public demand. Cash is a direct, tangible form of central bank money that has anchored transactions in the existing economic system. Losing access to cash could have important consequences for the U.S. economy and public interaction with the financial system. Those consequences could be especially important with regard to financial inclusion and the elderly, who on average use cash more. We think that cash should be retained until such time as there is no public demand for it. As set out in our answers to previous questions, an intermediated CBDC would help to preserve sufficient access to cash by the general public, notwithstanding the risks and trade-offs that will need to be considered fully.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

We note the continuing global efforts – notably by the CPMI's Payments Roadmap – to enhance existing cross border payments infrastructure, both by improving existing systems and introducing new initiatives. This multiyear global effort aims to tackle identified frictions in order to enhance cross-border payments. These frictions include: fragmented data standards or lack of interoperability; complexities in meeting compliance requirements, including for anti-money laundering and countering the financing of terrorism (AML/CFT), and data protection purposes; different operating hours across different time zones; and outdated legacy technology platforms. HSBC is closely involved in discussing these developments with policy makers, and we are supportive of the ongoing work to improve the existing cross border payments regime.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The motivations for considering CBDCs vary for each jurisdiction, and are often driven by specific local circumstances. There are, however, common considerations that are seen across many major economies, and we think that these are well explored in this consultation. We appreciate the work of the G7 to coordinate global efforts on the development of digital money, particularly between advanced economies. We note that no major advanced economy has yet fully launched a CBDC and most that are actively exploring or piloting CBDCs are largely focused on domestic retail models. As such, we believe it is too early to assess accurately the overall potential geopolitical implications of CBDCs, if any. There has been much recent interest on whether certain potential or actual CBDCs could threaten the reserve status of the U.S. dollar. We note that economists and economic historians often suggest that reserve currency status requires a large and stable economy, perceptions of political stability from investors (that is, that the rules of their investment will not be changed as they hold it), and deep, liquid and accessible financial markets in that currency. It is often also noted that whilst some other global currencies have fulfilled these criteria for decades, they have not affected the U.S. Dollar's reserve primacy. It remains to be seen whether CBDCs change any of these considerations. This is a fluid and complex debate and we will continue to follow it with interest, but we suggest that it would be premature to draw any firm conclusions at this stage.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Please see our responses to previous questions. We think the paper is generally well considered and comprehensive.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

There are important design considerations regarding transaction data access, personally identifiable information and Anti-Money Laundering/Customer Due Diligence requirements that should be a primary focus of CBDCs research and testing. The ability to meet consumer privacy expectations, as well as legal and regulatory requirements around financial crime, will be critical to the success of any CBDC, because these factors are critical for trust. CBDCs could create data that could negate anonymity. In considering CBDC designs, privacy needs and expectations must be balanced against other public policy priorities. Cash is almost fully anonymous once obtained through a transaction or withdrawn from an ATM, but full privacy and anonymity in digital payments could lead to a breakdown of the current Anti-Money Laundering regime. Digital money should include data privacy and protection in designs to coexist with, and support, the wider legal and regulatory framework for the financial sector and the overall integrity of the financial system. Financial institutions must ensure that they comply with all laws related to privacy, and also that they respect their customer's privacy expectations. If a reduction in privacy is seen to outweigh the benefits to user, then confidence in these new forms of money will decrease, and usage will be negatively impacted. There are some potential benefits from the use of data obtained from a CBDC, such as improved products and services. However, considerations around privacy need to be included throughout the design process. That includes the acknowledgement that under certain circumstances (e.g. anti-money laundering screening during onboarding), consent may not be possible or desirable. In other circumstances, it must be clear that only specific actors have access to certain types of customer data (e.g. bank level transaction data). For CBDCs to be trusted widely and therefore used, end users need to have clear information as to what data is being held by commercial banks, central banks or other actors, and know how their privacy rights are being maintained. This design balance is possible with technologies that are under testing. There are options for developing new mitigations for privacy, as noted in the BIS paper "III: CBDCs: An Opportunity for the Monetary System". In certain retail CBDC designs the payment authentication process can be built to conceal personal data from commercial parties and public authorities. There may also be value in allowing different levels of information to be shared through reporting mechanisms, for example, by making more data on macroeconomic level monetary flows available to a central bank. This would need to be explored further and carefully considered.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

CBDCs have the potential to present increased operational and cyber resilience challenges, not least due to the significant monetary and data value for cyber threat actors. While cash is truly anonymous, any CBDC must enable the sharing of sufficient information for the purposes of tackling fraud and implementing anti-money laundering and countering terrorist finance measures. This provides the potential for threat actors to identify and track individuals, as well as hacking a CBDC both to disrupt operations and to steal currency. The architecture of a CBDC will have a bearing on the requisite degrees of anonymity and data privacy, cyber security and overall operational resilience. As mentioned above, we note that CBDCs could have potential to develop new mitigations for privacy, cyber and broader resilience risks in the existing payments system. Testing and careful gradual implementation of digital money in real world situations with an appropriate regulatory framework for digital money is necessary. This would likely include proper evaluations, rigorous use case modelling and code and attack vectors testing, while complying with standardized, dedicated frameworks. This would allow the U.S. to explore the potential risks and the appropriate design options to mitigate them.

*14. Should a CBDC be legal tender?*

We believe that, in principal, a U.S. CBDC should be legal tender as it would be a digital form of the U.S. dollar. However, in practical terms, we note that consumers, merchants, and other payment actors would need access to CBDC technology to access a CBDC on similar terms to cash. This may in some cases limit the ability of some to accept a CBDC as a form of tender. This aspect should be considered carefully.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Our answers to previous questions, particularly answer 4, explain why we do not think that a CBDC should be interest-bearing.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

We believe that four limits outlined in the Bank of England paper 'New Forms of Digital Money' are a good basis to manage the risks of a CBDC. These are aggregate holdings,

transaction limits, access eligibility and remuneration. Before allowing digital money to be widely used or accessible to the public, we encourage the Fed to undertake assessment and testing to see what impacts those limitations may have on the risk created by new forms of digital money, particularly a CBDC, and also the realisation of its potential benefits. We think that the first three limits mentioned are appropriate for any initial testing. It is possible that any final version of a CBDC should have all four limits in place when first implemented, with adjustments made as needed. Of the four, the most important, and likely candidates for longer-term controls, seem to be the aggregate holding and transaction limits, in order to minimise the potential for 'digital bank runs'.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

While competition and innovation should be encouraged and supported, authorities must also ensure the continued resilience and stability of the financial system, as well as the proper conduct of all market participants. The regulation to which banks are subject would appear at this stage to be appropriate for CBDC intermediaries. An intermediated CBDC approach would ensure the continuation of division of labour between central banks and the market. This would see the private sector continue to perform customer-facing activities and operational tasks and enable the potential for greater innovation and competition. Assuming that central banks grant access to existing payment systems for appropriately regulated and licensed firms, these firms could compete to provide both CBDC wallets for consumers and/or a myriad of overlay services. It is crucial that regulatory regimes encompass the full scope of digital money instruments, to ensure the overall safety and stability of the financial system. Authorities must apply supervisory and oversight capabilities and practise under the principle of 'same activities, same risks, same rules'. This will be a critical component of a safe regulatory regime governing CBDCs, and other types of digital money, such as stablecoins and cryptocurrencies.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

As with existing electronic payment systems, we believe it will be very important for a U.S. CBDC to have offline capabilities. For CBDC transactions to become ubiquitous, building and maintaining merchant and end user trust and confidence is paramount. Central to this will be the ability make CBDC transactions anytime, anywhere. Offline capabilities bring several benefits, ranging from enabling better operating conditions to providing resilience in the event of major incidents. It is also seen by many authorities as critical to increasing financial inclusion by providing services to communities with limited or no network coverage and inconsistent electricity supply. Offline transactions would operate in a similar fashion to cash payments. While further study would be required, this might be achieved either by a stored value card or through a mobile phone application, using NFC and/or Bluetooth. This could be linked to existing payment rails with the cooperation of third parties or settlement via peer-to-peer using tokens removing the need for back-end settlement systems. Several aspects would need to be considered in detail, including ensuring accurate balances and deposit outflows, frequency of transactions, transaction limit amounts, any offline periods, anonymity and traceability. Ensuring AML, CFT and fraud risks are mitigated and that double-spending is prevented would also be vital. Cooperation between software, hardware and service providers, in partnership with regulators and financial institutions, will be important in order to develop a harmonized framework and security standards.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

A retail CBDC will have to compete with existing retail payment systems in the U.S. In order to succeed, it will need to achieve high levels of participation and adoption by multiple stakeholders, including banks, non-bank intermediaries, merchants and end-users. This will require seamless integration with existing payments infrastructure, a strong end-user and merchant experience and competitive yet fair incentives across both sides of the market to drive adoption.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Any CBDC must promise, credibly and consistently, to be fully interchangeable with existing forms of money. We note that the discussion paper does not go into the details of the specific requirements to achieve this, including technology requirements. At this early stage of thinking we are supportive of technological agnosticism. For example, it is not yet clear which technical approaches (e.g. centralized/decentralized, DLT or traditional) may be most suitable for a CBDC. We also think it is important to support innovation, for instance with respect to

smart contracts or ‘programmable’ money. These developments should be allowed to be explored within an appropriate, safe framework, that is technologically agnostic – potentially in approved sandbox environments.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

At this early stage of design considerations, it is still unclear what the optimal technology solution might be for a U.S. CBDC. In our answer to Question 20, we have mentioned the importance at this stage of technological agnosticism. While this will be resolved in due course, new challenges will arise that may be solved by new technologies, so the underlying principle of technology neutrality – possibly combined with open architecture – remains. This needs to be supported by a flexible and outcomes-based approach to public policy and regulation, in order to encourage safe and responsible innovation.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

The previously mentioned joint report by the BIS and a group of central banks proposed that, however designed, there should be three underlying principles governing the design and use of CBDCs: 1. They should do no harm to monetary and financial stability; 2. They should co-exist with cash and other money in a flexible and innovative payments ecosystem; and 3. They should promote broader innovation and efficiency in the financial system. While these are sensible and valuable guiding principles, the report also recognises that there are trade-offs that must be considered. Most notable is that of financial stability vs. the usability of a CBDC. Measures taken to mitigate financial stability risk could affect the level of parity between a CBDC and cash and commercial bank money. Further study is required to better assess the impact. The report also identified other trade-offs that the Fed could usefully consider as it progresses its thinking on a U.S. CBDC: • Tackling fraud vs optimising user experience: to maximise consumer adoption, it is likely that multiple functionalities will need to be addressed. This added complexity would likely require additional safeguards to tackle fraud risk, which in turn could limit functionality and affect adoption. • Resilience and privacy vs system performance: the development and roll out of new technologies requires firms and public authorities to pay ever closer attention to new forms of operational and cyber risk. CBDCs must therefore be developed and managed with operational security – as well as data privacy – at the heart. Depending on the design features, this could have an impact the performance of a system that would be required to settle instantly very large numbers of authenticated payments.

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*Name or Organization*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

We believe that the Federal Reserve Board's (hereby referred to as 'the Fed') paper, Money and Payments: The U.S. Dollar in the Age of Digital Transformation provides a good starting point in the public discussion of U.S. central bank digital currency (CBDC). The paper covers many of the most salient points concerning the potential issuance and the potential implications of CBDC. In the answers to the following questions, we provide input on the key themes addressed and would be happy to discuss any topics that the Fed feels useful in future engagements. Amongst these are the potential for CBDC to: 1) encourage a new digital payments and services marketplace; 2) support the shift in payments infrastructure from the physical to the digital, thereby better servicing citizens; 3) providing policy makers with new tools for the transmission of monetary and/or fiscal policy through programmable money; 4) support the dollar's domestic role in payments from third nation or private sector competition; and 5) strengthen financial compliance tools. From our involvement in central bank CBDC projects including Jura, Dunbar, eKrona, eTenge, Khokha, Jasper, and Inthanon, the importance of identifying the specific motivating factors that require a CBDC solution and designing solutions derived from them should not be understated. This judgement should be based on considered and informed evaluation of the U.S. domestic payments environment in which any potential retail CBDC would be expected to operate. This will allow policy makers to determine what requirements are needed from a solution and provide specification for technical designs to deliver against. In this sense, we believe that the Fed is starting from the sensible place - by identifying the problem before it examines potential solutions. This is to be commended. By way of example, one motivating factor for the introduction of a retail CBDC, might be the trend in payments away from physical cash and towards digital payments. If we consider this trend permanent, absolute, and inevitable, a foundational question the Fed might ask itself is whether public money needs to be made available in a digital, so that it continues to circulate and provide a competitive payment option for citizens. We note that this issue is one that the paper highlights. If the answer is that public money should continue to be issued, identifying which, if any, of cash's distinctive properties should be replicated in a CBDC will also a design to form. This in turn, will allow for further, more detailed analysis of the potential impact that a CBDC might have. Cash has many properties, with several not currently replicated in the digital sphere. For instance, there is not any one digital payment medium that offers the ability to transact: - using central bank money; - on a peer-to-peer basis; - without the permission of a third party; and - without the knowledge of a third party. If the Fed were to decide that the right of the individual to privacy (at least at some level) in the payments sphere was an important element of citizenship, then the technical design choices of a retail CBDC would be required to reflect these requirements. We discuss privacy in response to the set of questions later in the consultation but use it here as an example to illustrate the connection between the benefits that any solution might deliver and the relevance of those benefits to the ecosystem.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

From our observations of working with central banks, we note a common thread running through the examination is the question of whether the provision to the public of a central bank liability should be made available in a digital format. This is naturally an issue for each respective jurisdiction to consider on its own terms, but we believe that the issuance of a retail CBDC is the only way to replicate the property of cash as a public liability in the digital

payments landscape. It should be noted that the issuance of a CBDC can be delivered through different underlying technologies; however, distributed ledger technology (DLT) offers considerable and unique benefits to existing infrastructure. The programmability of DLT-issued CBDC allows for new services and innovation to emerge that can serve the public. This might be issued directly by the State (for instance, welfare payments or helicopter money) or by private sector payment service providers (PSPs) who could utilise the core functionality and value of CBDC to wrap additional programmability into the tokens and offer that to users. The adoption of innovation at the issuance layer can therefore foster a new and innovative marketplace and service providers, which non-DLT solutions cannot deliver. Some examples of programmability being examined include the provision of CBDC to children that supports digital payments but with protections programmed into the token preventing spending on age restricted items such as alcohol or cigarettes. Another example could be services aimed at supporting those with mental health issues to manage their spending, for instance preventing purchases at certain times of the day or requiring a countersignature to complete. The State might also wish to utilise the programmability of CBDC to issue welfare funds to recipients with policy targeted restrictions, akin to food stamps. In our view, the benefits that programmability offers could be achieved through a regulated stablecoin regime, which would allow PSPs to mint their own DLT digital currency token, likely backed 1:1 by fiat or even CBDC. To enable the private sector to offer such services and for the public to have confidence in them, we believe requires a prudent regulatory regime within which PSPs would operate, and that would provide protections against risks to financial stability.

### *3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

The reasons for financial exclusion can be complex, meaning that solutions often require the support of a wide degree of stakeholders in the public sector, private sector, charities, and community to be effective. We recognise that financial inclusion covers both access to banking and access to financial services and believe that CBDC might have an impact upon both these elements. Given that the design of a CBDC is not yet in development in the U.S. it is difficult to make a precise judgement on how effective it may be as a tool for financial inclusion. From our experience, nations who are pursuing the development of CBDC with a view to widening financial inclusion do so on the understanding that the provision of a new payment settlement medium, CBDC, will be accompanied by the availability of digital identification to support it as a payment medium and as part of a package of measures aimed at widening inclusion. We note that in April 2022 the Bank of International Settlements and World Bank produced a joint report on the possible impact of CBDC on achieving greater financial inclusion. This report can be found using this link:

<https://www.bis.org/fsi/publ/insights41.pdf>. One observed issue with access to financial services is the difficulty for an individual using cash to build up a financial history. This blocks the route to credit facilities as there is insufficient data on which to assess credit worthiness. Were CBDC to be adopted by this user, they could build up a recorded financial history and, in turn, choose to share that data with potential providers to gain access to a wider range of financial services. For the financial services sector, it is important to recognise that compliance requirements determine the criteria that potential customers must meet to be provided with banking services. The capacity for CBDC to assist citizens in meeting these requirements is potentially a significant benefit of its introduction. The question of whether CBDC itself is the only way of achieving this end result is a good one, indeed, it may not be. However, CBDC does provide the opportunity for new innovative players to enter the market and provide services to customers, which have otherwise been underserved by the existing market. It also, and perhaps crucially, shifts the burden away from brick-and-mortar solutions to digital ones reliant upon internet connectivity. Given that some are financially underserved by virtue of physical proximity to infrastructure such as ATMs and bank branches, the adoption of CBDC could lead to greater adoption and confidence in digital tools and in turn increase participation, generating market demand. It is difficult to see how the introduction of a CBDC could negatively impact financial inclusion whilst the availability, interoperability and substitutability of physical cash remains. The current payment landscape, which includes card and digital payments alongside cash, provides us with a reasonable model for how CBDC could avoid payment fragmentation with respect to financial inclusion.

### *4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

We believe that CBDC is the third form of central bank money, in addition to cash and central bank reserves. In this sense, CBDC would represent an additional payment medium through which to implement monetary policy, with decisions over issuance and governance entirely within its exclusive control. Subject to design preferences, a CBDC solution could provide the central bank with new data sets from which to better analyse the effectiveness of monetary policy decisions. Such data might include the real-time flow of money across the system,

potentially strengthening the ability of the Fed to model the outcomes of monetary policy decisions and pursue policy goals such as maximum employment and price stability. One feature of DLT enabled CBDC is the potential for programmability to enable interest bearing tokens as an additional (optional) tool for transmission of policy decisions. We cover this topic in more detail in response to Q15.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

We do not believe that the introduction of CBDC would have any effect on financial stability in and of itself. We consider careful study of the potential impact it may have vital in designing a solution that generates adoption and creates positive economic and societal outcomes. From our experience, discussions concerning financial instability and the introduction of CBDC chiefly relate to a direct issuance model of CBDC. As the Fed's paper points out this would likely be in breach of existing legislation and runs the potential risk of disintermediating the existing commercial banking sector from retail customers. We note that the direct model of CBDC issuance has gained little traction amongst central bankers researching the topic. In contrast, we observe that indirect or hybrid models of CBDC are more common architectural choices being examined by central banks. In both these models, the central bank is issuing a CBDC and allowing licensed PSPs to compete for users at the distribution layer. This preserves the fundamental roles currently enjoyed by the payments landscape and would mitigate the potential for financial instability caused by the introduction of a new payment settlement medium.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

As outlined in our response to question five, there are different suggested models for how CBDC might be distributed across the population, each with different implications for the financial sector. From our experience of working with central banks across the world, this topic is a key area of investigation and one that has received significant attention. We believe that digital currencies operating on DLT have the potential to create a new ecosystem of financial companies, products, and services. In a vibrant and competitive financial sector, there will be winners and losers, as competition between new entrants and the existing providers will provide consumers with innovation and choice. As CBDC is a payment settlement medium its issuance does not, in and of itself, have any de-facto impact on the financial sector. To model the impact, adoption will be a critical factor, which itself will be influenced by the relative attractiveness of functional and non-functional properties of CBDC, availability, market readiness, and consumer preferences. As such, analysis of the impact will vary by the design of the CBDC solution itself. With respect to the impact of CBDC versus a stablecoin or similar, this is a complex issue that depends upon the design of those respective instruments to consider. In our view, CBDC and stablecoins have the potential to be complimentary payment mediums within a two-tiered digital currency landscape. PSPs could offer and distribute CBDCs and stablecoins with different programmable features alongside one another, with CBDC continuing to be the liability of the Federal Reserve and stablecoins the liability of a private (likely regulated) entity. Much like the relationship between private money and public money in the current payments landscape, the substitutability and interoperability of these two forms of money is key in maintaining the value of both to represent a dollar and the confidence of the public in using both. In this landscape, the capacity for a CBDC to be 'wrapped' (programmability layered on top of the underlying token) or used as collateral against the issuance of a stablecoin will provide the financial sector with the technical foundations to innovate and grow.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

There are multiple tools (separate from architectural choices) that could mitigate the impact of CBDC on the financial sector through deposit migration. As the question highlights, some of these tools might detract from the appeal of CBDC adoption, so their use will likely need to be tested against research and analysis to achieve the desired outcome. We note that the European Central Bank has undertaken research on the impact of CBDC on the financial sector, highlighting potential tools to protect deposit holding institutions from deposit migration into CBDC. This is available via this link:

<https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2351~c8c18bbd60.en.pdf> This report highlights potential tools: 1) restrictions on how much can be held in CBDC; and 2) a tiering of renumeration. We note that in the People's Bank of China's CBDC pilots, users are only able to exchange fiat for CBDC through designated financial sector intermediaries; that custody of CBDC can only be provided by designated financial sector intermediaries; and that access to CBDC has been limited to a set population size. Through such measures central banks would

also be able to mitigate the risk of widespread migration of deposits into CBDC. The impact of this could also be observed and validated/dismissed using a staggered introduction. In our CBDC Sandbox, these types of controls are available to users, with programmable controls imbedded in the design of a CBDC ensuring that the distribution of CBDC can be controlled, thus allowing for choices that might reinforce the role of existing financial sector players or to widen access to increase competition. In our view, the best way for a central bank to mitigate against any adverse impact of a CBDC is through a thorough examination of the payments landscape and by designing a CBDC with clear and specific purpose(s) in mind. Having a clear understanding of the role that CBDC will play within a payments environment will help establish what, if any, tools are needed to mitigate the risks of an adverse impact upon the financial sector. For example, if a CBDC is designed to be the payment medium of choice in cross-border remittances then its impact on the financial sector will be much different than a design that is targeted at general day-to-day payments and competing (possibly with new functionality) against cash, and credit card and debit card payments.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

N/A

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

We note that a common motivation for the examination of CBDC is the role that a third nation or a privately issued digital payment token might play in the absence of a domestic central bank offering. Analysis of this question is by its nature speculative and dependent upon key factors such as the utility of a CBDC/stablecoin, projected adoption of those tokens, and how the regulatory environment might support, hinder or prevent adoption. In a domestic setting, the capacity of the State to impose a regulatory regime on acceptance and use of such tokens is a key tool, and likely to mean that adoption of a third nation or private currency remains niche, if not non-existent. In a cross-border setting this might prove more challenging, and the availability and functionality of an alternative currency could lead to some levels of currency substitution. The popularity of bitcoin as an alternative currency has arguably been for its speculation potential, rather than as a payment medium. By extension, the attractiveness of CBDC depends upon it having features that make it appealing as a payment medium. In the wholesale space, we are seeing an increasing demand for CBDC to be made available to institutional players on DLT. Our work on Bank of International Settlements (BIS) supported projects such as Jura, Helvetia, and Dunbar with major G20 central banks illustrates how the benefits of DLT providing atomic, instantaneous delivery vs payment (DvP) and payment vs payment (PvP) has been established. The U.S. dollar currently dominates cross-border exchanges, however, if its functionality or availability does not meet the demands of the market, it presents an opportunity for the currency of third nations to replace the hegemonic role of the dollar. However, the extent to which this threat is real depends upon a multitude of political and economic forces that reinforce the use of the dollar remaining stable and may be worthy of specific independent examination.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

CBDC as a retail level payments instrument may not suit all jurisdictions and may struggle to compete in some payment marketplaces where consumers see no need for it. We encourage all central banks to examine the economic and policy case for issuance based on domestic factors and independent of decisions by third nations. We encourage the United States to engage with the private sector and internationally with central banks and multinational agencies to share information and learning points from CBDC examinations to date. Technology led studies – regardless of their geography – will be of interest to all nations and provide learning points that can be included in domestic examinations of CBDC, if even the underlying policy or economic conditions differ from that of the United States. At the retail level, R3's Corda is supporting retail CBDC examinations in Sweden and Kazakhstan together with numerous projects focused on wholesale CBDC, such as projects Jura, Helvetia, Dunbar, Khokha, Jasper, and Inthanon-Lionrock. We would welcome any opportunity to serve the Fed directly in your work also.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

N/A

*12. How could a CBDC provide privacy to consumers without providing complete anonymity*

*and facilitating illicit financial activity?*

When we consider privacy, we do so in respect to privacy of what and from whom? In our experience, the answer to this varies by jurisdictional preferences and should be assessed alongside the lens of adoption and through analysis of consumer choices where privacy is often traded against convenience and cost. For instance, it may well be that the consumer is more comfortable with a private entity having access to their transaction data (much as card companies currently enjoy) than the State, or vice-versa. It could also be the case that a CBDC designed to provide cash-like privacy and anonymity be an attractive prospect for citizens and lead to successful adoption. The design of a CBDC, its characteristics, and distribution model is one for nations to take themselves, but we believe that it is possible to achieve privacy and compliance in one solution using DLT infrastructure. With Corda enabled CBDC, the programmability of CBDC would allow for the implementation of policy decisions to spread across the CBDC system. Programmability can be applied at the token level, at the network level or both to achieve the desired policy outcome. It is important to note that on Corda consensus is pluggable/customisable. This means that whilst Corda's default model offers privacy by default, it can also be designed to enforce network rules that require a designated authority to have a view of specific or all transactions. With direct respect to privacy, the programmability of a CBDC system could enforce compliance at the technical level. For instance, transactions below an agreed threshold could be made private with the use of technical solutions, such as chain-snipping/reissuance, secure enclaves, or zero-knowledge proofs. These solutions would provide the CBDC network with the assurances necessary to process the transaction without revealing associated data. In contrast, programmability would also allow for the automatic reporting of certain financial transactions. For instance, payments over the \$10,000 threshold for Internal Revenue Service reporting could be done automatically and in real time. We would be happy to discuss our privacy solutions and development roadmap with the Fed should they find this helpful.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

N/A

*14. Should a CBDC be legal tender?*

Yes. We believe that to maximise the adoption and utility of CBDC that it should be recognised as legal tender and become the third form of central bank money, alongside cash and reserves.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

It is possible for CBDC to be designed and issued with an interest rate programmed into the token. This feature has not been examined or implemented in any CBDC project to date but is one of those available to users of our CBDC Sandbox and allows users to examine the possibilities that such an optional design feature might deliver. At the wholesale layer, the capacity for a CBDC to hold interest bearing properties could provide central banks with a technical tool to enforce monetary policy decisions concerning interest rates by attaching the rate to the token itself. This might also be a feature that is passed on directly to retail CBDC issuance, should the central bank wish. At a technical layer, this is achieved by attaching a smart contract to the token, which implements the accrual or erosion of value to the CBDC at the required predetermined interval. As such, this would allow for the potential of both negative and positive interest rates to be applied to a CBDC. The decision of whether to design a CBDC with interest bearing properties is entirely in the hands of the issuer but is possible using DLT. From our work in this space, we have increasingly seen great interest in this functionality and with a view to it being a tool likely to only be used in later phases of implementation. R3 has no opinion on whether a CBDC should have interest bearing properties, but simply note that it is technically possible on DLT and demonstrable in our CBDC Sandbox.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

From a technical perspective, limiting the amount of CBDC that can be held by a single end-user is possible. This would require the technical capacity for the holding of individual wallets to be controlled and for an identity system to ensure that the same end-user could not hold multiple wallets with different PSP wallet providers. Both could be achieved through technical solutions alone or in coordination with legal or regulatory compliance requirements placed on PSPs. In our view, the use of DLT would enable a highly configurable system that could respond to policy decisions designed to limit the use of CBDC and enforce those rules instantly across the system. This would allow for the enforcement of rules and the

implementation of them, including the potential tightening or relaxing of quantity limits in real time. The issue of account capping is often associated with the issue of disintermediation of the financial services sector should CBDC be introduced, although it is not the only tool to mitigate this risk, as covered in our responses to Questions 6&7, respectively.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

In a two-tiered retail CBDC solution, PSPs serving as intermediaries provide custody and payment services to account holders. PSPs could be made up from the existing deposit taking market players, eMoney entities who grow to facilitate payments in CBDC, or new market players. We believe that given the role of these entities they should be regulated with the current eMoney regulation providing a good starting point for the kind of activity that a narrow CBDC intermediary could undertake. This might include the registration of entities, regulation of custody arrangements, reporting and disclosure of capital or underlying assets, and requirements concerning the redemption of tokens for fiat (or other assets), to name a few. We believe that the assessment of the risks that this activity represents should be reflected in the underlying regulatory regime, including recognition of any existing regulatory frameworks that possible PSP participants might be adhering to.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

In examining the case for a new payment rail in CBDC, requirements are emerging for the inclusion of additional benefits that could be facilitated by its development. Existing digital payment mediums cannot facilitate offline settlement, but CBDC supported by DLT could through peer-to-peer transaction with instant settlement. This would provide resiliency in the payments environment and offer the potential for end-users to better manage their financial affairs. As work conducted on Corda has investigated in the most recent report by the Riksbank, offline payments are possible in a CBDC solution. When considering offline payments, from a technology point of view, it may be helpful to focus on settlement finality and double spend protections. With regards to settlement finality, solutions could range from payments acting akin to an IOU, with payments only settled with finality once connectivity has been restored, to a bearer asset (cash-like) design that facilitates finality in offline scenarios using technologies such as NFT or Bluetooth messaging. In the second model, a CBDC token would act as a true bearer asset and the instant settlement would allow for users to have an accurate and real-time view of their balance, something which is not currently possible.

With respect to protections against the risk of double-spend, offline payments could be achieved by using trusted hardware solutions, such as smart cards or secure enclaves in smart phones to custody and transact during offline periods. These hardware devices would be required to uphold the integrity of the network, so would need to validate transactions whilst offline by attesting that the token being transferred is unique and unspent. This is technically possible within today's commercial offerings, although retail focused last-mile projects have not been the focus on central bank projects to date. We are working independently with industry players to further develop this leg of CBDC distribution. It is perhaps important to note that pursuing offline payment functionality as a means of resiliency, should examine CBDC against a true picture of the resiliency of payments. Cash remains the only offline settlement medium that provides finality, however it should be noted that the system underpinning cash relies upon an infrastructure that is partially dependent upon online elements, messaging systems and electricity and wholly dependent upon physical infrastructure. Therefore, whilst the comparison to cash in the moment of transaction is a good benchmark, we should assess how access to cash in offline environments compares between cash and CBDC - and crucially, how the two can support one another. In this instance, the capacity for CBDC to be available instantly to users via their mobile phones may support user choice and needs should the physical cash supply struggle to meet demand in prolonged periods of outages or be unavailable in rural geographies.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes, we believe that this is essential for CBDC to be successful. As stated in previous answers, CBDC should be developed through the prism of a product seeking market adoption. Ease of design and acceptance at point of sale are essential factors in the successful adoption of CBDC. In our view, adoption of a two-tiered distribution system for CBDC will allow the central bank to continue to focus on its core functions, whilst inviting the private sector to design an innovative and user-friendly wallet product that drives adoption. We believe that the successful adoption of CBDC requires a collaboration of the public and private sector, with ease of use and acceptance one of the areas for joint work.

*20. How could a CBDC be designed to achieve transferability across multiple payment*

*platforms? Would new technology or technical standards be needed?*

Interoperability between traditional payment rails and DLT is a core focus of our work with central banks, in projects such as the E-krona and Jura. We would be happy to discuss this work with the Fed directly. In our view a two-tiered model of CBDC, whereby the central bank acts as the issuer of the token and the PSPs provides distribution to the end retail user creates a huge potential for the development of a new ecosystem of financial service providers and payment service providers. Whilst we believe that there are clear and strong benefits to the selection of our platform, Corda, across this issuance and distribution model, we are actively working on models that support interoperability across Corda and non-Corda platforms to facilitate the effective transferability of assets across ledgers and payment rails. In project Jura, we developed a technical solution called Proof-of-Action, which allowed for entirely separate and sovereign networks to transact using atomic swaps. In Jura, that allowed the respective Banque de France and Swiss National Bank networks to transact whilst maintaining absolute sovereignty of their network and currency. In this instance, the project did not require our Proof-of-Action solution to operate across different blockchain protocols, but the solution design could be employed to achieve interoperability more widely. To achieve this, certain technical primitives (core computing code) are required from the platforms involved, principally the capacity to encumber, lock, redeem and destroy an asset issued on that platform. This would enable transferability across multiple payment platforms. We would be happy to discuss this work and others with the Fed. More information on the solution deployed in Jura is available via this link:

<https://www.corda.net/blog/facilitating-cross-network-cbdc-interoperability/>.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

One of the benefits of a DLT system underpinning the CBDC system is the capacity for policy decisions to be implemented and enforced throughout the system at the technical layer. The rules of a DLT network are determined by its governance arrangements, with the architecture of DLT infrastructure providing enforcement of these rules at a technical layer, with the network and/or token design adhering to predetermined rules. The enforcement of policy choices at the technical layer provides an additional, but powerful, tool for regulators and acts as a potential compliment to governance measures charged through legal and regulatory compliance. Moreover, should changes be made to policy affecting the operation of the network, these can be proliferated and enforced across the DLT infrastructure. The programmability of a CBDC token also enables rules to be attached to its transfer. This is achieved through the attachment of a smart contract to the token and allows for the enforcement of the conditions contained in the contract in its use. For instance, programmability would allow for a CBDC token to only be transacted according to pre-set conditions, such as use within a certain geographic location or for the purchase of specific goods. If an attempt to use the token is made outside of these conditions, then the system prevents the transaction, thereby enforcing the relevant policy decisions. Many of our projects with central banks have included governance requirements within the technical design, most notably in cross-border projects Jura and Dunbar, respectively. Our CBDC Sandbox provides examples of the programmability available in CBDC, which the Fed may wish to examine. By way of example, one of those designs choices provides the issuer of a CBDC token to control which entities can receive, hold and transfer CBDC. In this specific example, functionality allows for this access to be granted and withdrawn, allowing for policy choices (such as the sanctioning of an entity) to be enforced at a technical layer, making it impossible for an entity to transact in CBDC that the issuer has not permitted to do so. As a detailed illustration of how a DLT infrastructure can provide the tools for the enforcement of policy decisions, we have recently published a blog on how sanctions might be enforced using DLT infrastructure – this is available via this link:

<https://www.r3.com/blog/blockchain-and-the-future-of-sanctions/>

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

The design principles outlined in the paper are an excellent start in considering the requirements for a CBDC technical solution, and any additional principles should flow from considered analysis carried out by the Fed following public dialogue, engagement with stakeholders, and interaction with the private sector. In our view, the four principles outlined could be accommodated within one architectural design and CBDC solution. Privacy protection is something we have discussed in previous answers and a solution requires more input from the Fed to cover in precise detail what data must be private and from whom, but nonetheless, we believe that we could design a solution that enables this requirement through DLT enabled functionality. The requirement for intermediation is one that is also deliverable

and could be achieved through a two-tiered architectural model, amongst others. From a technical perspective, the two-tiered model forms part of the distribution of a CBDC and we have different solutions available to facilitate the possible roles that a PSP might play and the function that their network node would play. The transferability of CBDC between different intermediary parties is a principle that we strongly support and our work in project Jura is a good example of where we have facilitated the use of CBDC tokens by different parties using independent and sovereign networks and assets. To facilitate this principle in a design, a CBDC token model would provide a better solution than an account-based model. The final principle, identity verification, is one that we strongly support. Corda's core design as a private-permissioned design recognises the importance of connecting real-life legal identities to the activities of nodes on the network and can be incorporated within a CBDC design. We recognise the role that intermediaries are likely to play in the on-boarding of users into the CBDC environment and in this sense, this principle marries well with the requirement for PSPs to play a role in a potential solution.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

A CBDC is an existential gamble in search of a problem that risks the stability of our financial system and threatens a radical expansion of both state surveillance and of financial control by unelected bureaucrats lacking appropriate judicial oversight. It is inappropriate for the Federal Reserve to even contemplate such a dangerous experiment without explicit direction from Congress. We have detailed several risks neglected in the paper including the potential of draining trillions from commercial deposits, resulting increases in financial instability, and concentration of economic power in what is, ultimately, a government agency. Broadly speaking, just as the federal reserve does not manage its own grocery stores, despite food unavailability potentially causing financial distress, it should not manage its own cryptocurrencies. Particularly when that management carries potential existential risks to financial markets, to fundamental political rights, and to the integrity of the US dollar. A large cost neglected throughout the paper is the precise economic and social consequences of the Federal Reserve owning a potentially dominant share of private-sector assets. The paper admits that CBDC's are likely to result in much higher levels of Federal Reserve ownership of assets, which should raise concerns not just about state domination of our capital markets, but whether the Federal Reserve would be inviting deeper political influence in its decisions and conduct. The Federal Reserve has heretofore taken care to avoid being seen as directing private capital beyond the minimum needed to ensure financial stability, and has been particularly cautious about purchasing discretionary assets like corporate equities. Were a CBDC to radically increase Federal Reserve holdings to a degree that ownership of controlling stakes in corporations became widespread, even standard practice, such prudence may become politically untenable. This would further move us away from free-market allocation of capital and towards a Communist model of capital allocation. Ironically, the paper cites a concern from the President's Working Group that stablecoins' consolidation could someday lead to a concentration of economic power. The paper does not address the corollary that a CBDC, by concentrating the entire stablecoin industry into a single government-run version, then potentially adding trillions in commercial deposits to that pool, would constitute by definition an overwhelming concentration of economic power, this time in the hands of a government agency that is already highly politicized on topics as varied as climate change and social equity.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

The paper states that a CBDC should provide benefits that exceed costs and risks, and do so more effectively than alternative methods. However, the paper does not engage in a rigorous assessment of the most obvious alternative method: private stablecoins. Instead comparing a putative CBDC to the strawman of legacy payment systems. On transaction cost and speed benefits, private stablecoins and even Bitcoin already offer instant settlement and near-zero fees; last August payments on Bitcoin's Lightning network averaged one satoshi, currently 1/3000 of a penny.

<https://markets.businessinsider.com/news/currencies/the-lightning-network-is-driving-mainstream-bitcoin-adoption-2021-8>. Meanwhile, stablecoins could increase financial inclusion even more than a CBDC, given their lower compliance burdens on customers as well as the fact that, being a competitive industry, they can likely design and market consumer-friendly products better than the Federal Reserve can. Finally, stablecoin run-risk, mentioned in the paper, can be straightforwardly mitigated with oversight of stablecoin reserves. In short, the

paper explores creating a good that already exists in the private sector: a version of the US dollar that works reliably on blockchain infrastructure, and that provides excellent payment service and cost to a wide population. Rather than re-inventing speculative wheels, it would be less burdensome and less risky to simply monitor the existing private stablecoin industry for fraud and for quality of reserves.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

A CBDC would likely reduce financial inclusion, by “occupying the field” currently filled by private stablecoins, which offer superior privacy considerations and likely offer superior costs and user experience given competitive dynamics. World Bank research has found that cost and trust are the most important reasons Americans are unbanked. An intermediated CBDC model that includes not just commercial banks but an agency of the US government is likely to be more expensive than existing unintermediated private stablecoins, while such a model may worsen trust issues and further unsettle Americans who might prefer their banking remain private to government. Many unbanked consumers are not financially or technologically sophisticated, so may resist banking on what is, to them, a cryptocurrency. While many others among the unbanked are abnormally privacy-minded, perhaps due to grey-market earnings, and may be strongly resistant to what they may see as a government-run cryptocurrency. In either case, a CBDC may be uniquely unsuited to address this population — too novel and risky for the financially wary, and too much government in the product for the privacy-minded. Meanwhile, the paper mentions excellent existing projects to promote basic bank accounts such as Bank One, so any CBDC must be measured against those projects which, of course, do not raise fundamental threats to our financial system nor to individual rights.

*4. How might a U.S. CBDC affect the Federal Reserve’s ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

A CBDC likely introduces several risks to implementation of monetary policy, as well as the potential for deeply harmful collateral effects. Because a CBDC can be easily programmed to impose negative interest rates on users, the monetary zero bound disappears in proportion to CBDC uptake. To the extent the Federal Reserve is pursuing maximum employment goals at the expense of current inflation, this could lead to magnification of interest rates swings, exacerbating economic and financial instability. Related, this increases the temptation for politicians to apply pressure to the Federal Reserve to, effectively, force consumer spending in order to drive up current employment. Adam Smith famously warned that discretion over the currency is akin to a “Waggonway in the sky” — a seeming benefit that carries enormous risk. Negative rates on deposits would be quite an escalation in this risk, and they further risk destabilizing the tenuous trade-off between employment and price stability with which the Federal Reserve already struggles. CBDC’s can also easily be programmed to impose limits on the amount bought or sold. Indeed, the paper touts this feature to potentially attenuate the heightened risk of bank runs it freely grants CBDC’s may cause. While the candor is admirable, the paper fails to address that, during a financial crisis, CBDC’s could similarly be programmed to limit sales, potentially to zero. This could lock depositors in, forcing them to go down with the ship. As inconvenient as a bank run is for the banks involved, forcibly preventing bank runs, not by prudential oversight of banks, but by brute-force preventing consumer withdrawals risks catastrophic harm to American families in a crisis. If the Federal Reserve is imposing such a welfare trade-off, it should be explicit about its reasoning and about the probability-adjusted economic costs.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

A CBDC could present a number of novel risks to financial stability, starting with the potential single point of failure inherent in the design. Considering the Federal Reserve has no expertise running anything on a blockchain, so would likely have to rely on partners chosen by an inevitably politicized process, perhaps not choosing on merit, this risk is magnified. Either way, that single point, as the backbone of the U.S. financial system, would become an irresistible magnet — a “honeypot” — for hackers, including state-sponsored hackers, seeking to steal money or assets, to steal or disrupt customer information, or to create mayhem in one of America’s most critical industries. Yet larger risks come from the potentially privileged competitive threat that a CBDC would constitute to commercial banks, discussed in answer #6.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

A CBDC raises serious concerns for the integrity of the financial sector. Because a CBDC lacks default risk, one of the core risks in commercial banking, without careful and ongoing design it could occasionally or permanently become inherently superior to a bank deposit. This means that, absent constant efforts to keep CBDC's unattractive to depositors in every financial scenario — an effort that should not be taken for granted given changing political dynamics — the CBDC could amount to a roundabout way to eliminate commercial banking. This could, however unwittingly, effectively impose a state-run capital regime on the United States, closer to what China, currently a prominent CBDC promoter, might impose. Just as the “public option” was intentionally promoted by some during debate over the Affordable Care Act as an indirect way to wipe out private competition, a CBDC could stand as an existential “public option” threat to private banking. Even were a CBDC initially designed to be intentionally unattractive compared to bank deposits, the mere existence of this superior standing alternative to commercial deposits could immediately change behavior among commercial banks and their investors, dramatically reducing capital exposure, investments, and time horizons in the banking sector. Historically, even the prospect of nationalization of deposits has had an enormously disruptive effect long before the fact, and a CBDC may act as a standing threat awaiting the right politician. The paper grants that CBDC's raise the risk of a run from commercial bank deposits towards the CBDC. However, given this inherent superiority, it is likely that were such a run to occur, the former depositors may be less willing to return to banks. This could give a ratchet effect that gradually shifts deposits to the Federal Reserve in every crisis, magnifying the perceived risk to commercial banks and their investors. It should be noted that this risk does not exist from private stablecoins, which do not occupy a privileged risk profile given they are not a liability of the central bank.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

One possibility that avoids threatening commercial deposit banking is to render the code of the CBDC unalterable. This would mitigate risk to commercial banking, assuming the CBDC were initially designed to be unattractive to bank depositors. Of course, this inalterability could likely make the CBDC vulnerable to increased hacking attacks, as well as hasten its obsolescence. A second risk discussed has been that of execution given the Federal Reserve's paltry expertise in blockchains. The most obvious solution is to use intermediaries who do have that expertise. Of course, existing government agencies do try this, often with mixed results. Moreover, to the extent intermediaries are used, it could negate some or all of the alleged costs savings from using a CBDC in the first place. After all, if intermediaries are used that approximate private—sector expertise, this will likely cost the Federal Reserve as much or more than it costs those existing firms, while adding an additional layer of a bureaucratic Federal Reserve on top.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Paper cash remains popular, *inter alia*, for its ease of person-to-person use, for its privacy features such as evading a domestic abuser, and for its last-resort insurance function such as in a natural disaster. If CBDC's accelerate the disappearance of cash, this may cause enormous hardship to people who find themselves in such situations. Some people will doubtless seek out other last-resort media, such as foreign currency or gold, but empirically the vast majority probably will not. The Federal Reserve should thus make efforts to retain wide enough usage of paper cash that it remains widely accepted. The efficacy and economic impact of such efforts should be credibly estimated and included in a tally of the cost-benefits of a CBDC.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

In the absence of a CBDC, domestic and cross-border payments will likely continue improving at a dramatic speed. Private service providers such as Apple Pay and Venmo have made great strides in quality and price of service for domestic payments. Meanwhile, stablecoins and cryptocurrencies such as Bitcoin are increasingly used for low-cost cross-border payments, at prices approximating small fractions of a penny. Indeed, a CBDC could put these innovations at risk, effectively “occupying the field” and chasing out existing and future private-sector providers. This risk comes at little benefit; the paper itself outlines several sources of friction in cross-border payments, including “currency exchange, variations in different countries' legal regimes and technological infrastructure, time zone complications, and coordination problems among intermediaries, including correspondent banks and nonbank financial service providers.” Of these 5 sources of friction, a CBDC alone meaningfully solves none of them compared to current methods. In contrast, a private stablecoin or even Bitcoin, because they permit payments to bypass the traditional banking

system altogether, could substantially improve all of these five frictions but the time zone and currency risk. Even currency risk can be mitigated by private stablecoins since many large exporters also import, so they may actually want to keep substantial reserves in dollars, yet CBDC's remove this option if the payment must pass through traditional banks in each country.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Perhaps counterintuitively, if other countries issue CBDC's while the US does not, it would likely improve the dominance of the US dollar. The key mechanism is if those other countries "occupy the field" for stablecoins in their own markets, they effectively reduce demand for private stablecoins denominated in their own currency. If private sector stablecoins prove more attractive to users than government-controlled versions, which we might expect given competitive dynamics and less red tape, then each country that issues its own CBDC effectively takes itself out of the running to be the standard currency used in the most popular global payment mediums. We might expect, then, that increased issuance of CBDCs by foreign governments could actually reinforce today's US dollar dominance of online payments, reinforcing the network effect from exchange rates and ease as unit of account. Indeed, this process is already quite advanced, as USD stablecoins dominate the industry worldwide, while Chinese Yuan (CNY) denominated stablecoins are moribund. Perhaps the greatest gift China could give the US dollar is to rigorously promote their own CBDC, hence decimating private-sector CNY-denominated mediums.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Beyond mitigating security and competition risks discussed in answer #7, mitigation of privacy concerns could occur by licensing outside agencies to own that data. This would obviously raise a number of issues, not only in choosing and monitoring such partners, but in whether the Federal Reserve, as an agency of the federal government, has the power to even access that information. To mitigate the risk that CBDC's "occupy the field," and cripple existing private stablecoins, in theory the Federal Reserve could consider granting legal tender or other privileges to an existing private stablecoin to promote its wider use in domestic or cross-border payments. This would obviously raise a number of fundamental risks, from single point of failure to politicization of the process of selecting and managing of such a coin, which suggest this is a bad idea. Another feature that could mitigate trust and security issues surrounding a CBDC would be maintaining the code open-source. This is quite standard in cryptocurrencies, indeed it is expected, and could increase consumer acceptance and confidence in their ability to assess the hacking risk. Of course, keeping a CBDC, that is the backbone of the financial system, open-source could potentially open it to increased hacking risks in the first place, it could be untenable given military or law enforcement priorities, and at any rate those risk trade-offs are likely to be poorly understood by the Federal Reserve given its lack of expertise.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Privacy would likely present an impossible challenge to a CBDC under our Constitution. The paper asserts, correctly, that "Any CBDC would need to strike an appropriate balance between safeguarding consumer privacy rights and affording the transparency necessary to deter criminal activity." This is likely impossible; because a CBDC would need to be unable to facilitate illicit activity under the Bank Secrecy Act, it would necessarily need information on individuals. While Banks are able to collect this information, in many cases a government agency may not be. Further, this information, once deposited in government possession, may lack important judicial safeguards to misuse. Finally, it is not credible to assume that information collection will be minimal; given the one-size-fits-all design of a CBDC, it may require as much information from all users as it does from the most extreme users — suspected terrorists, say. Beyond privacy concerns, such a honeypot of centralized personal information would be an astoundingly attractive hacking target, almost guaranteeing on a long enough timeline that it will indeed be hacked. Such a risk, and the likely economic consequences to potentially hundreds of millions of Americans, must be credibly quantified in any responsible cost-benefit analysis of a CBDC.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Cryptocurrencies have been targets of hackers since their inception due to their novel architecture and the possibility of anonymous receipt of hacking proceeds, particularly in early

coins. These attacks sometimes target the assets themselves, they sometimes aim to cripple the blockchain instead, and where anti-money laundering (AML) and know your customer (KYC) data is collected, such as exchanges, hackers also focus on stealing information. As a result of this, there is today a well-trained and global veritable army of hackers who the Federal Reserve will almost certainly be unable to match. It will thus likely need to rely on outside contractors or private-sector partnering organizations. This would not only attenuate putative cost savings, it could raise management and legal questions, as well as further expose the Federal Reserve to outside political pressure. A CBDC could be a uniquely attractive honeypot defended by a uniquely incompetent and politically compromised guard.

*14. Should a CBDC be legal tender?*

A CBDC should not be legal tender because the risks outlined above suggest it should touch as few important parts of the financial system as possible. Ideally, to the extent that a CBDC is explored as an academic exercise, it should remain an experimental “sandbox” where no important transactions occur. One interesting idea is to use the “dual legal tender” model implemented last year in El Salvador, in that case designating both the US dollar and Bitcoin as legal tender. Of course, Bitcoin does not enjoy the default privilege that a CBDC might, so it avoids the existential threats to deposit banking discussed. Still, such a model could theoretically be used to designate an existing private stablecoin as dual tender, which is briefly discussed, and rejected, in answer #11.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

No, because paying interest on CBDC’s magnifies the risk of draining deposits from commercial banks, which risks effectively nationalizing both retail banking and the nation’s private savings. If such were to occur, the Federal Reserve would likely become subject to perhaps overwhelming political pressure to then deploy these government-controlled savings towards pet projects or simply towards funding federal deficits, which creates moral hazard for Congress and the executive to increase spending. In effect, private savings could become a piggy-bank for federal spending.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Yes, individual holdings of CBDCs should be limited. Without that limit, a CBDC could amount to an unlegislated arbitrary increase in the current deposit insurance limits. This would further increase the competitive risk CBDC’s pose to commercial bank deposits, further draining private savings towards Federal Reserve control.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Given the core functions of intermediaries include managing customer information and onboarding and serving accounts, commercial banks are the obvious choice. Of course, because a CBDC threatens to obsolesce their core business, good-faith cooperation cannot be assumed and the banks may need substantial oversight, subject to gaming. Noting that commercial banks employ very smart people, this gaming may evolve in ways the Federal Reserve is unable to predict. Beyond monitoring, this process should ideally reduce AML/KYC and other regulatory burdens to address the very transaction and administrative costs raised in the paper as justification for considering CBDC’s. Finally, assuming a transition would be gradual in order to minimize market and industry disruption, the process of introduction would itself have to be tightly monitored for unexpected behavior by depositors, and for unexpected counter-measures by the very banking partners presumably relied upon to manage the new competing CBDC. In short, it seems very likely that this process will yield one or more crises for the Federal Reserve and for the financial industry.

*18. Should a CBDC have “offline” capabilities? If so, how might that be achieved?*

It is always better for a money to have “offline” capabilities, but in the case of a CBDC this would likely have to be in the form of physical tokens, either sold directly by the Federal Reserve or via intermediaries. Such physical representations are not a common practice with existing cryptocurrencies, whether stablecoins or traditional crypto, so there is probably little demand for it, assuming some form of physical cash remains in wide usage, about which please see answer #8.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

No, a CBDC should not be designed specifically for point of sale. Existing private-sector

payment systems are established, widespread, and well-run, including ApplePay, Venmo, or the Strike app for Bitcoin Lightning payments. The Federal Reserve has no experience designing and operating such systems and apps, so it should rely on such partners to design and market payment systems, just as they do today with fundamentally hard-to-use tokens such as Bitcoin or federal reserve notes.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Cryptocurrencies today, including stablecoins, run on a wide variety of platforms, sometimes accessing multiple platforms to achieve a transaction. This can happen at low cost and seamlessly to the customer, because substantial engineering resources have been deployed, including generation and propagation of novel programming languages and innovative tools such as Lightning Network. The good news is that a CBDC, however poorly designed from a technical perspective, would likely benefit from this infrastructure and knowhow so as to be transferable across multiple platforms easily and cheaply. The bad news is that regulatory constraints may be higher with a CBDC than they are with normal cryptocurrencies or stablecoins, such that this existing infrastructure could be unable to experiment and tweak interfaces, rendering a CBDC at a critical, and self-inflicted, disadvantage. In theory, the Federal Reserve or some other agency could make up the gap, expending resources to achieve similar ease and costs as the private sector would, but in practice this seem unlikely given expertise and legal constraints ranging from inability to tolerate illicit usage to legal constraints on gathering personal information as a government agency.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

The cryptocurrency space is moving very fast — it's a challenge even for experts to keep up with new technologies, even new words. Therefore, it is almost certain that a CBDC will be obsolete before it is even released. This means that design choices should be extraordinarily simple, indeed humble, and not aim to add too many features. The model here is Bitcoin, which despite a very simple design has endured for 13 years by relying on outside partners, such as wallet or Lightning developers, to keep the product useful, while remaining as simple as possible and also remaining robust to outside attack.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

An important mechanism used in the cryptocurrency community is open code architecture — every aspect of the code must be transparent and easily visible to anybody in the world. This allows thousands of professionals and amateur coders to easily police the code, and it is critical to maintaining trust in the currency. If a CBDC is to be trusted to the degree it competes with both bank deposits and with existing stablecoins and cryptocurrencies, it should ideally have an open-source design that enables stakeholders to see what's happening to their money, and to assess any risks. This openness obviously presents potential conflicts with national security or law enforcement priorities, which may ultimately render the CBDC a doomed concept given the poor market survivability of closed-source coins and their dramatically reduced public acceptance. A final important design point: a key debate within cryptocurrencies has been the trade-off between adding features and increasing attack surface. There is a broad recognition that simpler code, hence simpler features, reduces the opportunity for potential hackers, while more complexity inevitably equals more attacks. Given that, on a long enough timeline, some percent of those attacks will succeed, and given the exponentially greater attractiveness of hacking a CBDC, both for private hackers and state-sponsored hackers, this wisdom should not be lost in the design stage of a CBDC. Indeed, given those stakes, a very strong starting assumption should be to keep the code as simple as possible.

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*Name or Organization*

Electronic Transactions Association

*Industry*

Trade Organization

*Country*

United States of America

*State*

District of Columbia

*Email*

stalbott@electran.org

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The payments industry is innovative, dynamic, and competitive, focused on delivering cutting edge products with robust security measures to help consumers connect with merchants, make payments, and move money. Consumers have numerous cost-effective products available for payments, including credit and debit cards, mobile wallets, and ACH payments, among others. The industry continues to innovate, particularly in the area of real-time payments, where the private sector has introduced faster, real-time bank settlement services, and the card networks have developed new push-to-card services. In addition, ETA members are working with the Federal Reserve on FedNow Instant Payments, which will provide instant payments once it is complete. The Federal Reserve's paper identifies many of the key benefits, policy considerations, and risks presented by the potential adoption of a CBDC. As discussed throughout these comments, the most critical factor is for the Federal Reserve to design a system that (a) continues to leverage private industry and supports interoperability in order to ensure broad adoption, innovation, and efficiency for users, and (b) protects user privacy while balancing the need to combat money laundering and other similar risks. In support of these broad goals, key considerations of a CBDC should include "(i) continued access to central bank money, (ii) resilience, (iii) increased payments diversity, (iv) encouraging financial inclusion, (v) improving cross-border payments (vi) supporting privacy and (vii) facilitating fiscal transfers."

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

As the Federal Reserve moves forward with exploring a CBDC, ETA encourages the Federal Reserve to consider carefully potential downside risks along with the potential benefits, particularly given that the adoption of a CBDC would have a dramatic impact on the U.S. financial infrastructure and broader economy. Most proposals envision CBDC to be a direct substitute for cash using the same underlying technology as cryptocurrency. While all electronic payments are cash substitutes to some degree, a CBDC would be issued, maintained, and settled by the Federal Reserve. The CBDC would be transacted P2P, but since it lacks physical form, the transfer would be recorded to a digital ledger (possibly using blockchain technology). Regardless of its final design, the adoption of a CBDC would have a profound impact on the U.S. economy and the existing financial infrastructure. In light of this, ETA believes there is a common set of principles against which any proposed CBDC should be measured. As the federal government assesses a potential CBDC, it should carefully consider these principles and ensure that any proposal best serves the needs of consumers, furthers financial inclusion, preserves and strengthens the financial system, and ensures that consumers continue to have access to a robust and innovative array of secure banking and payment options. If the Federal Reserve decides to move forward with a CBDC, ETA submits that the only way to achieve the potential benefits of a CBDC are by designing a system that supports the concepts set forth in ETA's Principles. The ultimate design of a CBDC will have a significant impact on the extent to which it provides additional benefits for consumers and businesses. On one extreme, the Federal Reserve could adopt a model in which it is interfaces with end-users. ETA and its members do not support this approach because it would place the Federal Reserve in the difficult (if not untenable) position of operating the entire system, would limit the potential for future innovation, and would disintermediate the existing financial sector in a way that would ultimately harm consumers. The better approach, in ETA's view, is an intermediated solution—again, if the Federal Reserve ever issues any

CBDC at all—where the CBDC represents a direct claim on the central bank, but onboarding and real-time payment services would continue to be operated by private intermediaries (e.g., banks and fintechs,) through the two-tier model similar to how it is done today. An intermediated approach would allow the Federal Reserve to leverage existing payment infrastructures and the ongoing private innovation, while also minimizing operational risk for the Federal Reserve.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

As policymakers and the Federal Reserve consider implementing a CBDC, ETA supports a CBDC that advances these 7 guiding principles: 1. Innovation: Continual investment in innovation is at the heart of past, present, and future improvements to the financial ecosystem — enabling new capabilities, strengthening cybersecurity and consumer protection, increasing efficiencies, and expanding access to financial services. Any public sector engagement with the financial sector, including the deployment of a CBDC, should serve as a catalyst and a platform for continued innovation. 2. The Right Tool for the Job: Policymakers should compare the suitability of a CBDC with existing systems and other ongoing improvements to payments infrastructure — such as real-time payments systems — to find the approach that best fits their country's transactions needs. 3. Private Sector Participation: Expanded financial inclusion, ongoing payments innovation, and the efficiency of national and international payment flows all depend on vibrant private sector competition in payments. A CBDC should seek to preserve those functions and minimize effects on the broader financial system through a two-tiered ecosystem that includes the private sector in its design, piloting, and distribution. 4. Interoperability: Any CBDC would be introduced into an established, robust, well-functioning payments ecosystem. Ensuring interoperability between a CBDC and other forms of national and international payments systems is necessary to avoid weakening existing mechanisms and harming consumers and businesses. Any CBDC must be able to interoperate seamlessly across the existing landscape. 5. Open Acceptance: Consumers will be more likely to adopt a CBDC if it can be used on existing acceptance infrastructure and is supported by known and identifiable payment methods (e.g., in-person and online) that are linked to the user's existing devices and accounts. To be useful to consumers, any CBDC would need to take advantage of existing acceptance networks and acceptance infrastructure to allow any merchant that accepts cards to also accept the CBDC. 6. Consumer Protection: A CBDC should require a framework of standards and rules that safeguards the privacy and security of every transaction, protects consumers' interests, and gives consumers the confidence necessary for in-person and online transactions. It should also ensure that consumers understand those protections and how they may differ from those offered by other payment methods. 7. Regulation Tailored to the Risk Profile of the Participant: Entities engaging with a CBDC should be subject to regulation that is tailored to the activities and risks that they pose due to their position in the payments ecosystem. Appropriate regulation should consider potential harm to consumers as well as safety, soundness, and financial stability risks. If the Federal Reserve decides to move forward with a CBDC, one of the underlying themes of these principles is the need for a clear regulatory framework that facilitates the modern payments infrastructure in administering CBDCs in a way that protect consumers and drives economic benefits. ETA's members support the goal of providing universal financial inclusion. In this regard, the payments industry continues to advance the global flow of commerce while delivering affordable financial tools and services that meet the needs of underserved consumers. A goal of ETA member companies is to continually enhance the electronic payments and financial ecosystem so that it is accessible for all consumers, while ensuring that their transactions can be completed securely, efficiently, and ubiquitously. The payments industry continues to innovate in this area, whether through the development of prepaid cards, buy-now-pay-later, or other technologies, like cryptocurrency and stablecoins. In order for a CBDC to further financial inclusion, the following should be taken into account:

- The CBDC should support the two-tiered payment system, which can support broad adoption through enrollment and education on CBDC.
- The CBDC should support interoperability, including with existing domestic and international payment instruments like bank transfers, payment cards, and other similar technologies.
- The CBDC should protect privacy to the greatest extent possible to encourage broad use and adoption.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

The Private Sector is Best Positioned to Administer CBDCs Consistent with Existing Market Structures If the Federal Reserve moves forward with a CBDC, the program should be structured to model after the existing intermediated system, and designed to take into account the expertise and input of the private sector. This is one of the key design requirements given that central banks generally lack experience in implementing and administering the various day-to-day functions required for a nationwide retail payments service. In the case of a CBDC

operated exclusively by a central bank, the central bank would be required to maintain and update all aspects of the payments and banking system. Accordingly, in ETA's view, the potential benefits of a CBDC can only be realized through an intermediated model that includes the private sector in its design, piloting, and distribution. With an intermediated model, the private sector would take the lead in providing consumers and businesses with access to the CBDC, whether through digital wallets or other technologies. In this model, consumers would access their CBDC at a bank or fintech, likely through a digital wallet-type service. One of the key benefits of this model is that it does not require the central bank to provide retail banking services. As recognized by the Bank for International Settlements, a "natural split in any tiered CBDC system would be for the central bank to be responsible for the core of the system to the extent that they could steer the system to deliver policy goals and a safe and efficient payment system. Multiple private entities would then act as intermediaries, competing and offering choice within an ecosystem to drive innovation and efficiency." This approach makes economic and practical sense because the private sector is in the best position to manage the various functions necessary to administer CBDCs – ETA's members, for example, already facilitate the provision of numerous safe, innovative, and convenient payments products and services. The payments industry has decades of experience in managing functions such as anti-money laundering compliance, customer service, dispute resolution, privacy protection, cybersecurity, and the deployment and updating of technology on a regular basis. If a CBDC is adopted, the private sector has the tools, experience and proved track record needed to assist consumers in accessing, using, and transferring funds in a safe and reliable way.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

A significant policy risk involving the adoption of CBDCs is the potential negative impact on bank lending and credit availability. Under the current two-tiered banking model, banks hold deposits for depositors, but are not required to maintain the entire amount of the deposit on hand. This system of fractional reserve banking provides borrowers with access to safe, low-cost deposit services, while also allowing banks to increase their ability to lend funds to consumers and businesses. The implementation of a CBDC could negatively impact the fractional reserve banking system and the corresponding benefits, particularly if the CBDC is designed in a way that encourages the move of bank deposits to the Federal Reserve. This would reduce access to credit and have a substantial impact on the U.S. economy and monetary policy. Similarly, a Federal Reserve CBDC could allow consumers to make equivalent electronic transactions without the need for a bank account. Banks would need to offer higher interest rates and improved services to induce consumers to deposit their funds rather than leaving them in the form of CBDC. In this respect, a CBDC could lead to volatility in deposits or even a long-term reduction in deposits, which, in turn, would likely negatively impact bank lending the provision of financial services. Finally, it is important that any CBDC be designed with resiliency as a key characteristic. To be successful, a CBDC must guarantee the availability and usability of funds. One of the reasons the current payments system has been so successful is that private industry offers consumers multiple safe and efficient payments options. A key way to ensure resiliency is for any CBDC to work as an intermediated system and leverage private industry, including by supporting interoperability between a CBDC and other forms of national and international payments.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

A poorly designed CBDC might adversely affect the financial sector in a number of ways, all of which would ultimately have a negative impact on consumers and businesses that rely on having access to safe, efficient, and innovative financial services. As a starting point, any CBDC that does not include private sector participation risks losing the innovation that is critical to ensuring improvements to the financial ecosystem. In addition, while stablecoins and certain other private developments have been designed with interoperability and the private sector in mind, a CBDC that shuts out the legacy private sector would negatively impact a core aspect of the U.S. economy, with the potential for significant disruption. And, as noted, the adoption of a CBDC could negatively impact the fractional reserve banking system and the corresponding benefits, particularly if the CBDC is designed in a way that encourages the move of bank deposits to the Federal Reserve. This would reduce access to credit and have a substantial impact on the U.S. economy and monetary policy.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

The best– way to mitigate any adverse impact of CBDC on the financial sector is for the Federal Reserve to design a system that includes the private sector in its design, piloting, and

distribution. This approach is also the only approach that has a realistic chance of achieving the numerous potential benefits offered by CBDC.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Each year, ETA members make global commerce possible by processing more than \$27.5 trillion in purchases and P2P transfers worldwide through the deployment of innovative payment products and services. In the U.S. alone, in 2021, consumers and businesses spent \$8.2 trillion in card volume and at least \$1 trillion was moved over the largest P2P networks. The infrastructure supporting this system is sophisticated, secure, and fast — processing over 270,000 transactions per minute. The electronic payments system is also reliable — it operates 24/7/365, in the U.S. and around the globe, without interruption. And ETA members are not slowing down; the industry is constantly investing and innovating, creating new financial services and payments products that benefit individuals and small businesses alike. Accordingly, consistent with the CBDC Report, ETA has long advocated for a federal approach to a CBDC that takes into account potential benefits of the technology while also minimizing any negative or unintended consequences. To this end, ETA has previously published “7 Guiding Principles for CBDC” against which any proposed CBDC should be measured. As the Federal Reserve assesses a potential CBDC it should, consistent with these principles, ensure that any proposal best serves the needs of consumers, furthers financial inclusion, preserves and strengthens the financial system, and ensures that consumers continue to have access to a robust and innovative array of secure banking and payment options. As explained in our Principles, if the Federal Reserve determines that the benefits of a CBDC outweigh the risks, then ETA strongly encourages the adoption of an “intermediated model,” in which the private sector takes the lead in providing the public with digital wallets or other technologies that are used to manage the holding and use of CBDCs. As part of any further consideration of a CBDC, the Federal Reserve should continue to coordinate with public and private stakeholders to address the practical and legal feasibility of implementing a CBDC, and how the adoption of different CBDC design choices might impact operating performance and key policy and economic considerations

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

The payments industry has and will continue to drive innovation in the absence of a U.S. CBDC. The payments industry is innovative, dynamic, and competitive, focused on delivering cutting edge products with robust security measures to help consumers connect with merchants, make payments, and move money, including via credit and debit cards, mobile wallets, ACH payments, and even cryptocurrencies. The industry continues to innovate, particularly in the area of real-time payments, where the private sector has introduced faster, real-time bank settlement services, peer-to-peer payments, and the card networks have developed new push-to-card services. Further, with or without a CBDC, the private industry continues to develop and explore use cases for private stablecoins, which offer some of the same potential benefits as a CBDC. Many of these services are evolving to operate even more efficiently at the cross-border level, and new technologies are being tested and developed that may further facilitate efficient cross-border transactions, such as stablecoins and cryptocurrencies. In this regard, however, cross-border transactions are naturally more complex. Some of these challenges would apply to a U.S. CBDC in that it would need to be designed for interoperability with other CBDC systems.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

If the Federal Reserve decides to move forward with a CBDC, the Federal Reserve should implement a framework of standards and rules that safeguards the privacy and security of every transaction, protects consumers' interests, and gives consumers the confidence necessary for in-person and online transactions. It should also ensure that consumers understand those protections and how they may differ from those offered by other payment methods. If the Federal Reserve moves forward with a CBDC, the centralized approach (as opposed to an intermediary-focused approach) presents a greater risk of potential

surveillance, leading to abuse of user privacy interests. One of the benefits of a CBDC that incorporates the private sector is that the financial industry has significant experience in protecting user privacy while also combatting fraud and other illicit activity. The financial sector has spent years implementing policies, procedures, and safeguards to protect user privacy pursuant to various federal, state, and international laws, including, for example, the Gramm-Leach-Bliley Act, the California Consumer Privacy Act, and the European Union's General Data Protection Regulation, among others. At the same time, the financial sector is on the front lines battling fraud, terrorist financing, and other illegal financial activity through the implementation of due diligence, monitoring, and reporting systems. While the payments industry is subject to various legal requirements, such as those under the Bank Secrecy Act, the industry has voluntarily implemented numerous additional tools and safeguards to combat potential fraudulent financial transactions. With the benefit of decades of expertise, ETA members have developed effective due diligence programs to prevent fraudulent actors from accessing payment systems, monitor the use of those systems, and terminate access for network participants that engage in fraud. Working with its members and industry and government stakeholders, ETA has published various guidelines that provide underwriting and diligence best practices for merchant and risk underwriting, including the "Guidelines on Merchant and ISO Underwriting and Risk Monitoring" and "Payment Facilitator Guidelines." These documents provide industry with underwriting and diligence guidance, including information on anti-fraud tools, security, and related issues. For example, when it comes to card data protection, the payments industry took the lead in developing the Payment Card Industry Data Security Standard ("PCI-DSS") for handling the safety of cardholder data. The PCI-DSS sets forth requirements designed to ensure companies that process, store, or transmit credit card information maintain a secure environment for such data. In addition, the PCI-DSS establishes a framework for implementation of the data security standards, such as assessment and scanning qualifications for covered entities, self-assessment questionnaires, training and education, and product certification programs. And, of course, the payments industry continues to refine tools for monitoring and analyzing payment data for suspicious activity. With improvements in machine learning and artificial intelligence, payments companies are gaining additional tools for identifying suspicious patterns in transaction data. These are just some of the tools that the payments industry has developed in recent years to fight fraud, protect consumers, and ensure the integrity of the payments ecosystem. These efforts have been remarkably successful in reducing fraud while ensuring that consumers have access to fast, reliable, and safe payment options.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

If the Federal Reserve decides it is necessary to implement a CBDC, ETA encourages a two-tiered system that relies on banks, and fintechs, to serve as intermediaries with the primary responsibility for interfacing with consumers and businesses that use the CBDC. In line with the Federal Reserve's expressed views, ETA agrees that any regulations for fintechs that are given access to serve as an intermediary of a potential CBDC should be tailored to the activities and risks that they pose and be evaluated on their risk management and operational capabilities, including a standard set of core protections and requirements such as considering potential harm to consumers as well as safety, soundness, and financial stability risks in the ecosystem. Furthermore, the Federal Reserve should provide on-going oversight to ensure risk profiles have not changed materially, and risk management structures, and operational capabilities remain adequate. For additional guidance, please refer to ETA's comments submitted in Docket No. OP-1747, "Guidelines for Evaluating Account and Services Requests."

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of*

*sale? If so, how?*

If the Federal Reserve decides to move forward with a retail CBDC, the CBDC should be designed to work efficiently at the point of sale. The key to the successful implementation of a CBDC is ensuring interoperability, which will facilitate broad adoption, coordination with existing and alternative payment methods, and ensure the potential for future innovation. Without interoperability and coordination with legacy systems (or future non-CBDC systems that may be implemented), there is a risk of both low adoption and fragmentation between various closed loop systems, all of which would negatively impact user acceptance and system viability.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

ISO/TC 68/AG 2 - Standards Advisory Group

*Industry*

Other: International Organization for Standardization

*Country*

Switzerland

*State*

*Email*

matteo.acconnero@ecb.europa.eu

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The ISO/TC 68 Standards Advisory Group will not provide a response to this question.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

The ISO/TC 68 Standards Advisory Group will not provide a response to this question.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

The ISO/TC 68 Standards Advisory Group will not provide a response to this question.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

The ISO/TC 68 Standards Advisory Group will not provide a response to this question.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

The ISO/TC 68 Standards Advisory Group will not provide a response to this question.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

The ISO/TC 68 Standards Advisory Group will not provide a response to this question.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

The ISO/TC 68 Standards Advisory Group will not provide a response to this question.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

The ISO/TC 68 Standards Advisory Group will not provide a response to this question.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

The ISO/TC 68 Standards Advisory Group will not provide a response to this question.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The ISO/TC 68 Standards Advisory Group will not provide a response to this question.

*11. Are there additional ways to manage potential risks associated with CBDC that were not*

*raised in this paper?*

The ISO/TC 68 Standards Advisory Group will not provide a response to this question.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

The ISO/TC 68 Standards Advisory Group will not provide a response to this question.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

The ISO/TC 68 Standards Advisory Group will not provide a response to this question.

*14. Should a CBDC be legal tender?*

The ISO/TC 68 Standards Advisory Group will not provide a response to this question.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

The ISO/TC 68 Standards Advisory Group will not provide a response to this question.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

The ISO/TC 68 Standards Advisory Group will not provide a response to this question.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

The ISO/TC 68 Standards Advisory Group will not provide a response to this question.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

The ISO/TC 68 Standards Advisory Group will not provide a response to this question.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

The ISO/TC 68 Standards Advisory Group will not provide a response to this question.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

The response is submitted by the Standards Advisory Group (SAG) of Technical Committee 68 (TC 68) of the International Organization for Standardization (ISO). The SAG as a subgroup of TC 68 (TC68/AG2) acts as an advisory sounding board to support and engage with regulators on financial services standards requirements, for the effective and efficient use and development of financial services standards, delivered using a cooperative relationship approach. In this context, the response will concentrate on the technical standards that can be leveraged for CBDCs. There are several technical standards of ISO/TC 68 that can be leveraged for CBDCs as the consistent use of standards is the foundation of achieving transferability across multiple payment platforms. First, is a standard that has been in place for some time and is used widely for the identification of fiat currencies. This is the ISO 4217 standard. This standard has been examined by ISO/TC 68 subject matter experts with the conclusion that the ISO 4217 standard is fit for purpose for the identification of both conventional and digital forms of fiat currencies. Another standard to be leveraged for CBDC is ISO 17442, the Legal Entity Identifier (LEI), which could be used for the identification of counterparties in CBDC transactions and to identify holders of CBDC. The LEI is the only global standard for legal entity identification with the identifier connecting to key reference information that enables clear and unique identification of legal entities participating in financial transactions and related activities. LEIs data records contain information about an entity's ownership structure and thus answers the questions of 'who is who' and 'who owns whom'. Further benefit can be derived from data that accompanies a LEI record which can be automatically retrieved or verified at no charge from the Global LEI System. The central banks will decide which use cases are possible for their CBDC. In case if consumers of the country involved (or of other countries) are allowed to use the CBDC, the LEI of the issuing central bank will contribute to further consumer protection (and fraud prevention). Finally, there are financial messaging standards used in payments and credit and debit card transactions. First, the suite of ISO 20022 standard financial messages for payments and card

transactions is very comprehensive. There is the ability for additional messages to be created, is required, using the ISO 20022 development and governance processes, to support any specific needs for CBDCs. Second, the ISO 8583: 2003 Financial transaction card originated messages standard support that all ISO 4217 Currency Codes are included in these messages. If central banks would encourage use cases that their CBDCs (central bank money) and commercial bank money are both used in card messages a further review of the standards is would be required.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

The response is submitted by the Standards Advisory Group (SAG) of Technical Committee 68 (TC 68) of the International Organization for Standardization (ISO). The SAG as a subgroup of TC 68 (TC68/AG2) acts as an advisory sounding board to support and engage with regulators on financial services standards requirements, for the effective and efficient use and development of financial services standards, delivered using a cooperative relationship approach. In this context, the response will concentrate on the technical standards that can be leveraged for CBDCs. Use of standard identifiers for currency codes (ISO 4217) and for legal entity identifiers (ISO 17442) are technology agnostic and can continue to be leveraged with future technological innovations. The concept of the ISO 20022 is based upon defining a business model to capture the interactions of the actors/counterparties and information needed to execute specific activities, such as instructions for CBDC payment or card transactions. As technologies innovate and change, the business model can be leveraged when implementing to support new technologies used in financial messaging. If central banks would encourage use cases that their CBDCs (central bank money) and commercial bank money are both used in card messages a further review of the ISO 8583 standard in relation to the ISO 4217 standard is required.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

The response is submitted by the Standards Advisory Group (SAG) of Technical Committee 68 (TC 68) of the International Organization for Standardization (ISO). The SAG as a subgroup of TC 68 (TC68/AG2) acts as an advisory sounding board to support and engage with regulators on financial services standards requirements, for the effective and efficient use and development of financial services standards, delivered using a cooperative relationship approach. In this context, the response will concentrate on the technical standards that can be leveraged for CBDCs. Given that often firms operate in multiple jurisdictions and also are connected to more than one RTGS, use of common technical standards in the CBDC space will allow firms that operate in multiple jurisdictions and/or trade in multiple currencies (including CBDCs), as well as technology providers (as developers of RTGS systems), to avoid the complexities that would exist if different standards are used. In case Central Banks would encourage that their CBDCs to be used for the payments leg of securities transactions with financial instruments based on the ISO 6166: 2021 ISIN standard (wholesale and/or retail), a further review of the design is business process would be required.

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*Name or Organization*

*Industry*

Payment System Operator or Service Provider

*Country*

United States of America

*State*

New York

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Potential Benefits • Increased cash flow within the domestic markets makes the US equally or more competitive on the world markets • A tangential benefit may be in the court of public opinion - as more and more consumers commit their finances to unsecured nonbank denominations the risk to the general populace grows each day. If an event occurs that impacts these private organizations some may hold/view the federal government accountable for not engaging to offer some level of protection for its citizens. Policy

Considerations • Detailed specifics for contingency plans to mitigate the risks of disruption to operations - this leads to fallback plans based on more mature payment rails solutions in the event of unforeseen circumstances. Risks • Currency value manipulation could be exposed to a new set of risks due to the increased speed of payment processing - this includes influence from other countries for nefarious purposes. • Attempts at centralization could have negative perceptions in light of what is viewed as a decentralization technology development. • Any implementation would rely on the underpinnings of a blockchain technology - Different blockchains exist and these are further modified by vendor specific blockchain forks and units - these are maintained without a unified standards body spanning open source and private sectors - so any implementation would need a foundation and this foundation must be supported, maintained and standardized for the long term - whichever is chosen.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Thinking outside of the box, the passing of regulations that requires either FDIC insurance or central bank managed digital deposits for all nonbank cryptocurrencies could achieve something similar - this may essentially convert many private service providers to a form of digital commercial banks. Perhaps the biggest inherent risk in cryptocurrency is price volatility. Stablecoins were created to address this concern and are centralized, pegging themselves to fiat currency or commodities. However, stablecoins are privately controlled and are not currently regulated to the level we are comfortable and currently accustomed. The creation of a CBDC could possibly offer similar benefits to stablecoins but allow for greater control and oversight. A Federal Reserve CBDC should provide arbitrage opportunities vs. US Dollar (Commercial Bank, Notes), adding stability to the Digital Currency. Because Commercial bank, Notes and CBDC are all backed by the same credit (Fed) they should trade in tandem.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

In some respects, yes - if the consumer model provides the flexibility for inclusion that is offered by paycards, etc. - it may have a positive effect. However, access to digital products requires wide ranging internet access for networks and devices - so any progression to digital and proposed benefits could also have negative connotations for lower income segments of the population. There could be a perception that these investments isolate these groups due to limited internet access, so coupling this with supporting programs for public internet accessibility may be a required additional commitment and expense.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Our organization cannot comment on this at this time.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

A CBDC has the potential in providing greater financial stability in a myriad of ways: faster transaction settlements, allowing users to potentially utilize the central bank directly (avoiding commercial bank fees and risk), real-time rate changes, real-time tax, and a central bank digital ledger will likely help prevent banking fraud and illicit transactions. Our organization is especially proud of our strong commitment to financial controls and fraud prevention – and we would like to see an equivalent level of criminal activity suppression integrated into any central bank digital currency utilization.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

The greatest adverse effects posed by the creation of a CBDC would likely be seen at the conventional banking level. As consumers shift from their dependency on conventional bank accounts and payment processors to acquiring digital wallets, it has been implied that connectivity may be provided directly between consumers and the Federal Reserve. This structure change would diminish the amount of money financial institutions would receive through deposits – which would then in turn limit the amount they could loan out – which could possibly cascade into hurting small businesses, which we support. Enhanced disintermediation risk or “flight to quality” risk - out of Commercial Bank money to CBDC, could lead to an economic crisis. The ripple effects of these systemic changes could have broad ramifications, not just to the financial sector, but to the entire economy.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Our organization cannot comment on this at this time.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

A further decline in cash usage has no bearing on the creation of central bank money for the general public. Currently, 97% of the money in circulation today is handled digitally through online checking deposits – yet our treasury still prints currency. Multiple rails for servicing payments can co-exist and offer greater flexibility for the general public. Also, there should be considerations that the use of cash provides a significant option for non-banked individuals and areas of limited connectivity or POS access.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

FedNow, SWIFT advancements, and private sector innovations would still likely continue being developed. Decentralized finance and cryptocurrency projects would also likely continue – as well as partnerships and/or acquisitions between conventional financial systems and newer blockchain projects. The most prevalent examples are Ripple and the potential impact on the use of SWIFT - which could help to facilitate large commercial transactions across borders, especially as more countries develop their own CBDC's.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

As you are aware, the majority of global central banks are either exploring or actively creating their own central bank digital currencies. The preeminent risk in not pursuing a US CBDC is the opportunity this may provide other nations to supplant the US dollar as the world's reserve currency. A tangential risk also arises from the US falling behind in the global exchange in the form of a negative impact on the balance of trade.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Our organization cannot comment on this at this time.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

CBDC's may provide privacy to consumers by allowing the use of non-custodial wallets

(users holding their own private keys) while simultaneously subjecting the wallets to similar KYC/AML requirements found in conventional financial institutions today (eg: recording/reporting sizeable and/or suspicious transactions, etc.). The most important aspect will be transparency and disclosure of these privacy considerations making consumers aware of what data is and is not collected and how it will be used. Our organization is especially proud of our strong commitment to financial controls and fraud prevention – and if a US CBDC is ever implemented, we look forward to assisting any way we can in creating and fostering an equivalent level of criminal activity suppression.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

CBDC's are of course centralized and are therefore subject to attacks and manipulation – however, so is our current financial system. As mentioned in question #18, there a variety of cyber defenses (inherent to the blockchain or how the physical network is created) that should help prevent any cyber-related failure. Additionally, our current financial system has consumer protections in place to assure the American public that their assets are safe (FDIC, NCUA, SIPC, etc.). Similar consumer protections for a central bank digital currency would help foster adoption and safeguard users from liabilities they are not responsible for. The platform should have at least an equal level of safeguards with very particular focus on an isolated network with connectivity controls to restrict any access from unauthorized parties or actors. Strict auditing must be a required for any institutions with connected access due to these being the only points of vulnerability in an isolated network.

*14. Should a CBDC be legal tender?*

One of the risks employers face when paying employees in digital assets is wages must be paid in "cash or negotiable instrument payable at par". Stablecoins address some of the concerns with this requirement, but some states specifically require wages to be paid in US dollars. For a CBDC to be seamlessly integrated within all facets of our current financial system and regulatory framework, it is imperative for it to be considered legal tender.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Our organization cannot comment on this at this time.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Setting quantity limits would greatly diminish the utility of the currency. As a large payroll provider, our client's range in overall size – and setting quantity limits or thresholds may unjustly prohibit many of our clients from being able to select a CBDC as an option for direct deposit. In a pilot or introductory stage, a quantity limit may be leveraged, but we recommend removing any barriers to entry once a CBDC has been fully created. Additional auditing measures should be implemented for large CBDC holders to ensure the balance of holdings is not unfairly held or manipulated.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

When examining how the financial system currently works, a CBDC could theoretically operate the same way. Commercial banks and credit unions are required to be chartered in order to have an account with the Federal Reserve, which they use to deposit reserves. Any CBDC intermediary could be required to have a similar account and hold similar reserves for operational risk purposes. There is also the consideration for FDIC and backing these as ensured transactions for any participating institutions acting as these intermediaries thus raising the consumer confidence for adoption.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

At the system level, providing "offline" functionality is intriguing, however that could present its own host of concerns – eg: properly authenticating transactions. Network stability and resilience are key, though. Creating a balance between inherent protocols within the CBDC (eg: Byzantine Fault Tolerance) and robust hard infrastructure (eg: several physical locations which can continue operations in the event one or multiple other locations go down) would still provide many of the benefits of an "offline" system. At an individual user level, "offline" capabilities are already widely-used today with cryptocurrency cold storage wallets, sidechains, and in many multi-signature transactions – and theoretically, a CBDC could be crafted with all those applications in mind, too. Using personal CBDC storage as an example – an offline version could safely store private keys (where transactions would be signed),

while an online version containing public keys may be shared when dealing with others. By bifurcating the authentication, the individual transactions are more secure. Properly educating the public on this process will be very important, though. Many novice cryptocurrency users already commonly believe using cryptocurrency hardware wallets physically moves their assets to their hardware wallet – when really it is just their private keys pointing to their assets stored on the blockchain itself.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes, many of the widely-used innovations found within current merchant services and point of sale solutions could theoretically be adapted for usage with a CBDC. QR codes, NFC technology, etc. A CBDC would also provide a more inclusive retail market by allowing the non-banked public an easier way to purchase items and non-banked businesses to more easily perform retail transactions. Government assistance programs (like EBT) would also likely be easier to support. One obvious concern with forcing an integration of a CBDC at point-of-sale is where the expense will be levied. Upgrading technology is often expensive, and we fear that without some financial assistance or incentive – a forced usage or acceptance could negate many of the desired effects.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Yes, interoperability and integration across multiple payment platforms is important. From a user standpoint, private key security and management is also directly correlated to facilitating transfers properly. The public will need to be properly educated on how to use this new payment system properly and greater accountability will need to be placed on the individual for transactions. An open standard should be ratified and widely adopted to avoid fragmentation and promote an environment of equal and fair competition for payment platforms.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

It is hard to predict what the future holds in store for our country, however a CBDC should be resilient enough to adapt or “upgrade” as our needs change. Using cryptocurrency as an example, protocol changes are often proposed and implemented in order to improve upon earlier versions – hardening security/encryption, boosting verification rate, etc. Similar to many cryptocurrencies, a system may be created where the public is informed of what changes to the CBDC are suggested and the public votes on those changes (ie: through their CBDC wallets). In addition, the fundamental technology choices should be evaluated for the adoption of open standards and avoid proprietary technologies wherever possible. This is especially important to consider any CBDC that requires extensive technology support may result in long term technical debt and reduced agility.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Our organization cannot comment on this at this time.

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*Name or Organization*

International Currency Association

*Industry*

Trade Organization

*Country*

United Kingdom of Great Britain and Northern Ireland

*State*

*Email*

jutta.buyse@currencyassociation.org

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The most important considerations that should characterise a public digital currency in order for it to be – like cash – a public good, are that it should be a private transaction, easy to use, widely accessible, with maximum safeguards for security and come at no additional cost to the users, the holders and the recipients.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

For a digital currency to ensure full privacy, acceptance and availability, it must be the central bank that is the issuer of it. Central banks are public institutions that the public can trust to issue a currency that truly guarantees privacy and the universality of acceptance and availability. Private initiators of currency i.e. cryptocurrencies can rightly never have the full trust of the public. The Federal Reserve has clearly stated that the CBDC will complement cash, not replace it, and the ICA welcomes this clear stance. The ICA also highlights that central banks have a duty to protect cash and its role in society.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

The contribution that a CBDC can make to financial inclusion will in part depend on its design. Any form of payment that wishes to be a public good should be easy to use. A simple user interface and non-expensive devices are important. People of all ages should be able to use it and any barriers to using should be carefully weighed against the need for universal accessibility. The ICA also hopes that the designers of a digital currency will take inspiration from the efforts of banknote and coins designers to ensure that persons with a visual disability can make full use of cash.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

As e-commerce and digital interactions are on the rise, the discussion on a future digital currency to use for purchases made electronically is becoming increasingly prominent. The

added value of a CBDC does not lie in being an alternative for cash. A purchase made electronically does not per se imply that it must also be paid for electronically. Indeed, a number of merchants and applications have made it possible to pay for electronically-ordered goods or foods in cash upon delivery. However, the high charges that consumers and merchants face to be able to pay for transactions electronically, make it attractive to find a digital public alternative to these payments; a digital currency issued by the central bank could make this possible.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

We take the opportunity of this question on other large economy nations and their development of CBDCs to recommend the free-of-cost exchange into a CBDC or physical currency of another country/trade zone, just as a digital and physical dollar must be mutually convertible.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

It is essential for a future CBDC to guarantee full privacy to its users. A CBDC will only stand apart from existing and future private (cryptocurrency) means of electronic payments if that is what it achieves to do. For example, a CBDC needs to allow e.g. abuse victims to save for an escape without leaving any digital trail or for people to protest without fear of repercussions. Without the full privacy of physical cash, future personal freedoms and rights become threatened. No data should be collected from the user. However, AML/ATF – and KYC – procedures, where they are applicable to physical cash, need to be applicable to digital cash as well.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

A CBDC should offer maximum safeguards for security and protection against cyber-attacks. The risk to the economy posed by a cyber-attack as well as to public confidence in a CBDC could be devastating, particularly if a successful attack went unchecked or were undiscovered for a period of time. Even an unproven claim that the CBDC had been hacked could potentially be highly destabilising for the economy. This risk is an order of magnitude higher than for physical cash, as there is no easy/practical way for the public to authenticate whether a CBDC is genuine. Developing a public authentication solution for a CBDC should thus also be a key requirement to ensure that digital cash can be a public good.

*14. Should a CBDC be legal tender?*

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

While all stakeholders including commercial entities have their role to play in the process where a digital dollar should be as widely available as possible – and immediately convertible into physical cash – the end result must also be that a digital dollar is free of charge to use.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Digital cash should be usable also in offline mode, with some restrictions, notably to avoid multiple use of the "same Dollar". AML/ATF procedures need to be applicable to digital cash, just as they are applied to physical cash. Mechanisms should be in place to avoid

overspending by means of artificial friction, just as physical cash provides – it is not common to mistakenly spend 1000 Dollars instead of 10 Dollars in the physical world, the same should be ensured for the digital sphere.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

While it is likely to always require some electronic application/investment such as a smartphone, the hurdle for adoption should be kept as low as possible to ensure that the digital dollar is as straightforward as possible for consumers to use. A simple form factor of a digital device to store/access value could also be offered by the public authority, e.g. a chip in a card or wearable, a simple reader/display.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

A CBDC and physical cash must be mutually convertible. That means free and flexible conversion of a digital currency into physical cash and vice versa, in addition to the free exchange into any physical or digital or physical currency of another country/trade zone. It is important that exchangeability between its physical and digital forms is available at no cost and without any system to penalise one or the other, in order to offer a fair and free choice for consumers. A network allowing users to easily swap cash for their CBDC would contribute to maintaining the cash infrastructure. We stress here the need to have a competitive environment. Paying for goods or services or exchanging money should not cost the user. Unfortunately, today's consumers and to a sometimes even larger extent, merchants, are facing a myriad of charges and hurdles for most transactions, including for bank account fees, credit card fees and fees to set up an electronic payment service to pay online. A CBDC should aim to be a counterforce to such costs and fees by demanding no additional cost.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

Ohio Bankers League

*Industry*

Trade Organization

*Country*

United States of America

*State*

Ohio

*Email*

ekleymeyer@ohiobankersleague.com

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Thank you to the Federal Reserve for engaging all stakeholders in their research regarding establishing a central bank digital currency. We submit these comments on behalf of the membership of the Ohio Bankers League (OBL). The Ohio Bankers League ["OBL"] is a non-profit trade association that represents the interests of Ohio's commercial banks, savings banks, savings associations as well as their holding companies and affiliated organizations. OBL has over 170 members which represents the overwhelming majority of all FDIC-insured depository institutions doing business in this state. OBL membership represents the full spectrum of FDIC-insured depository institutions from small mutual savings associations owned by their depositors, community banks that are the quintessential locally-owned and operated businesses, up to large regional and multistate holding companies that have several bank and non-bank affiliates and conduct business from coast to coast. Ohio depository institutions directly employ more than 70,000 people in Ohio. We are the only trade association in Ohio that represents all segments of FDIC-insured depository institutions.

While the paper at a high level discussed the policy consideration that a CBDC could be a "near-perfect substitute for commercial bank money", it does not go further into the unintended consequences of the creation of a near perfect substitute for commercial bank deposits. Taking deposits away from independent financial institutions in Ohio will ultimately increase the cost of credit for Ohio consumers and businesses. Ohio's small communities would suffer as local deposits would be sucked out of our communities and sent to Washington to be held as a Federal Reserve liability. If financial institutions no longer have the ability to lend local deposits, they will be forced to find other more expensive ways to meet the credit needs of their communities, thus increasing the cost of credit hurting the very people the Fed is looking to help with CBDC. Additionally, there are risks associated with a stablecoin than the paper does not address. The paper declares that a stablecoin is in fact stable, and there are not credit or liquidity risks associated with it. However, that is not true. Just recently, the two stablecoins Terra and Luna pegged to the US dollar became untethered to the US dollar and completely collapsed, whipping out roughly \$60B. If that were to happen to the CBDC which had achieved widespread adoption it would plunge the US economy into free fall. Finally, the paper details many technological improvements the Federal Reserve has made in the payment space, all of which have been made in conjunction with the US banking system. The national check clearing system, ACH system, and Real Time Payments system all have all relied on regulated financial institutions as a partner in the settlement of payments. That has been a successful model as consumers can rely on the confidence that their payments have all the protections associated with the US banking system. By bringing the payment process outside of the banking system and including other third parties that do not have the same rules and regulations as the banking system, we would be exposing consumers to additional risk, simply for the sake of speed.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

One of the benefits that is herald by proponents of central bank digital currency is the ability for a financial inclusion. The banking industry has been working incredibly hard to bring

unbanked and underbanked individuals into the financial system with certified BankOn accounts. We are pleased to report 90% of all Ohioans now live within 10 miles of a bank branch that offers a BankOn account specifically designed for previously unbanked individuals. Instead of the Federal Reserve creating a competing product, which could cause confusion in the marketplace, the Federal government should endorse the BankOn initiative, so we are all pushing in the same direction. The BankOn initiative has already been proven to work. In Ohio these accounts started to gain widespread adoption in 2019 which coincides with the lowest level of unbanked individuals, 5.4 percent, since the FDIC started surveying in 2009. That same report includes information on the unbanked population in which they cite privacy concerns as one of the top reasons for being unbanked. A general-purpose CBDC would generate data about users' financial transactions, exposing individual's private financial details to the federal government like never before. A CBDC would create significant privacy concerns which would ultimately render most of the benefits for the unbanked moot. This means it is unlikely they will adopt a CBDC that exposes more personal financial information than anything existing in the marketplace.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

We do not believe there is a full understanding of the impact CBDC would have on financial stability. Before the Fed decides to do anything in this space there needs to be a detailed analysis on the possible impact of a CBDC on the Fed's monetary policy tools and decision-making. The analysis should evaluate whether a CBDC could result in adverse unintended consequences for monetary policy implementation; assess whether a CBDC facilitates the use of unconventional monetary policy tools (including negative interest rates) that the Fed has previously rejected or require a balance sheet that is politically unsustainable. It should also examine any implications for financial stability through bank runs that may result from transfers of commercial bank deposits into CBDC accounts, as referenced in the paper.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

The paper states a CBDC could serve as a near perfect replacement for commercial bank deposits. A federally subsidized near perfect competition for commercial bank deposits has the potential to change the American banking system in a profoundly negative way. Banks compete in a very crowded marketplace already for deposit and loan customers. The consumer benefits from that competition, which drives down cost for them. When competition is fair local financial institutions can provide competitive services to their communities. However, when competing against the government the playing field is uneven. No other entity has the ability to lose money like the federal government.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Putting limitations on the interest paid for CBDC deposits and holding limits would mitigate the negative impact on commercial bank deposits.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Based on the most recent Federal Reserve Findings from the Diary of Consumer Payment Choice, cash usage has declined to the lowest level ever. Cash purchases make up only 19% of all purchases in 2020. In the same year due to the CARES Act, the largest outflow to the general public of central bank money in history happened very successfully. The economic impact payments, which 82% of the American population received directly into their bank account on the existing payment rails. This was an unprecedented test and showed that in a mainly cashless society the general public had quick access to central bank money.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The Federal Reserve needs to assess the need for CBDC here irrespective of the decisions of other nations to implement their own CBDC. We have a very different society with much broader privacy rights than some of the other nations, and those differences need to be weighed carefully.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

The Federal Reserve would have to build out the most robust BSA/AML workforce in the nation to fight financial illicit activity if a CBDC were created. Every bank currently monitors their own customers for illicit activity but if a customer moves from the bank to CBDC they will not have the ability to see transactions, leaving that work to the Federal Reserve. A CBDC would give the Federal Reserve unheard of knowledge into the everyday financial transactions of Americans. We do not see a way for the Federal Reserve to protect the privacy of individuals which also monitoring their transactions for illicit financial activity.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

No, the CBDC should not pay interest. Paying interest will as the paper details, create a near perfect substitute for bank deposits.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

There should be limits to how much an individual or entity can hold in CBDC. With no limits, depositors would likely shift many of their deposits held in banks to a CBDC accounts, particularly in moments of financial anxiety. Banks would then be in a position where they must significantly contract their own loan portfolios or raise additional debt or equity financing. In uncertain economic times banks need the flexibility to work with struggling customers. CBDC would such vital resources out of commercial banks at exactly the wrong time exacerbating poor economic conditions.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

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*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*



*Name or Organization*

The Committee on Capital Markets Regulation

*Industry*

Other: 501(c)(3) research organization

*Country*

United States of America

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Massachusetts

*Email*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

We find that the principal benefits advanced in favor of a CBDC are either uncertain or achievable by other means. Conversely, the potential for a CBDC to diminish the market's role in intermediating funds through the private banking sector, and thus increase the government's - and particularly the central bank's - role therein, seems very undesirable. It is therefore our position that as of the present time the costs associated with the introduction of a CBDC outweigh its uncertain benefits. While we favor further research and discussion of a CBDC, we are skeptical that such consideration will change the calculus herein described. The major cost, and most substantial issue, with the possible widespread use of a CBDC would be the threat to the private banking system's role in intermediating savings and loans or other forms of assets, a phenomenon referred to as "disintermediation." CBDC holdings, whether in the form of accounts at the Federal Reserve ("Fed") or tokens in a wallet, constitute liabilities of the Fed. The increase of the liabilities of the Fed would require the Fed to increase its assets by purchasing assets or increasing lending, thereby expanding the role of the government in intermediation, and thus diminishing the role of the private banking sector. Relying on the government rather than the market to provide credit in this fashion would be inefficient. It also raises major issues of political economy, since it could significantly increase the role of the government in the economy. Moreover, this expanded role would be effectuated through an independent central bank rather than through the elected legislature and the executive branch. Measures intended to limit a CBDC's disintermediating effect, such as imposing limits on CBDC holdings or negative interest rates, would be difficult to devise—what would be the amount of such limits or negative interest rate, and when would these measures be triggered? Limits on CBDC holdings would also affect banks of different sizes unequally: in particular, a low limit would likely have a greater effect on smaller banks, since there is evidence that smaller banks tend to have smaller average account sizes. See Jeffrey A. Clark, *Economies of Scale and Scope At Depository Financial Institutions: A Review of the Literature*, 73(8) ECONOMIC REVIEW, FEDERAL RESERVE BANK OF KANSAS CITY 16, 24 (1988),

[https://www.kansascityfed.org/documents/1039/Full\\_publicationBE64D1A9-46BB-4E6E-A17D-7C8F25376624.pdf](https://www.kansascityfed.org/documents/1039/Full_publicationBE64D1A9-46BB-4E6E-A17D-7C8F25376624.pdf). Moreover, if any of the purported benefits of a CBDC materialize, capping CBDC holdings would limit the extent of those benefits. It has been suggested that the Fed could re-intermediate the funds it attracts through CBDC holdings by returning the funding it receives in the form of CBDC deposits to the banking system. It is however unclear how such a measure could be carried out without undesirable side effects. Assuming a bank depositor could only exchange cash-denominated bank deposits for CBDC through its own bank, the Fed would execute the transfer by debiting the transferring bank's account and crediting the account of the CBDC holder. The Fed could, in theory, then return the CBDC funds to the transferring bank by making a loan to the transferring bank, thus maintaining the same level of individual bank funding. See Francesca Carapella & Jean Flemming, *Central Bank Digital Currency: A Literature Review*, FEDS NOTES (Nov. 9, 2020), <https://www.federalreserve.gov/econres/notes/feds-notes/central-bank-digital-currency-a-literature-review-20201109.htm>. But constant Fed funding to individual banks based on depositors' shifts from the deposits of individual banks to CBDC could unduly expose the Fed to safety and soundness concerns (since faltering banks would get more Fed funding) and would increase the percentage of the funding available to the banking system that is government supplied rather than market based. Any significant credit losses the Fed incurs in connection with these loans would risk political attack on the Fed and thus threaten its

independence on its core function, monetary policy. The Fed could alternatively return the CBDC funds it receives to the banking system via an auction to qualifying banks. This measure could maintain the same level of total funding to the banking system but would alter the funding available to individual banks (quite apart from their safety and soundness) and still increase Fed funding overall to the banking sector, and thus its overall role in the economy. Additional costs associated with the introduction of a CBDC are identified below, namely the potential infringement of privacy that would accompany a more trackable digital currency as compared with cash, and the possible increased risk to the financial system that arises from the ability of depositors to transfer funds into a CBDC in a financial crisis.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

One set of reasons offered in favor of a CBDC can be characterized as “defensive.” First is the concern that the rise in use of stablecoins could threaten financial stability (for example, if coin providers could not meet redemption demands or had operational failures), pose problems for the conduct of monetary policy, or be used to avoid tax and anti-money laundering (“AML”), terrorism, or sanction provisions. However, these concerns could be met by more highly regulating stablecoins, or in the extreme case, prohibiting them. Further, it is unclear how the creation of a CBDC in and of itself would defend against such dangers if the use of stablecoins was still permitted. Consumers might still choose to hold stablecoins in substantial amounts even following the introduction of a CBDC. A second defensive reason is to counter the development of a CBDC by other jurisdictions, most particularly China. The major concern is that the CBDC that China has recently developed, known as e-CNY, could enhance the reserve currency status of the renminbi. In our view, the reserve status of the renminbi is undermined by fundamental factors, such as the use of capital controls, concern with political stability and the unavailability of liquid assets to invest in. It is far from clear how a Chinese CBDC would override these concerns. Another purported benefit of a CBDC relates to the possible programming of a CBDC to permit more efficient asset transfers/settlements through smart contracts. Such contracts are being used today to a limited extent in connection with stablecoins and we agree that the combination of programmable money and smart contracts may contain the potential for substantial benefits.

For example, the current Automated Clearing House (“ACH”) payment system allows for the programming of debits/payments from existing bank accounts. See NATIONAL AUTOMATED CLEARING HOUSE ASSOCIATION, *What is ACH?*

<https://www.nacha.org/content/what-is-ach> (last visited May 4, 2022). It could be possible to program smart contracts to trigger ACH-like transactions once the conditions specified in the smart contract have been met. See Peter Lone et al., *Using Distributed Ledger Technology for Payment Directories*, FEDS NOTES (Feb. 3, 2022), <https://www.federalreserve.gov/econres/notes/feds-notes/using-distributed-ledger-technology-for-payment-directories-20220203.htm>. ACH transactions, however, are not immediate and contain counterparty and settlement risks. See *What are ACH Payments and How do ACH Payments Work?*, SQUARE (Jan. 13, 2022), <https://squareup.com/us/en/townsquare/ach-payments>. Smart contracts leveraging programmable money like a CBDC are not subject to these risks and could thus increase the efficiency of transactions and lower the above mentioned risks associated with the current systems. See Phillip Sander, *Will Blockchain Replace Clearing Houses? A case of DVP Post-Trade Settlement*, FORBES (Dec. 2, 2020), <https://www.forbes.com/sites/philippssandler/2020/12/02/will-blockchain-replace-clearinghouses-a-case-of-dvp-post-trade-settlement/?sh=72f0bf408fb5>. We would, however, question the necessity of a CBDC to realize this goal when other forms of digital assets, such as tokenized commercial bank money, could be developed for use in smart contracts. Converting money into a programmable form could be a major new step in smart contract evolution, and the possible benefits could be substantial, but it is unclear that a CBDC is necessary to realize these benefits. We support further investigation into this question.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

One way that CBDCs could advance financial inclusion is by allowing individuals without bank accounts to make and receive payments through accounts at the Fed. However, according to FDIC surveys, the most common reasons why individuals do not hold bank accounts are the amount and unpredictability of fees and the inability to meet minimum balance requirements. See FEDERAL DEPOSIT INSURANCE CORPORATION, *HOW AMERICA BANKS: HOUSEHOLD USE OF BANKING AND FINANCIAL SERVICES 2019 FDIC SURVEY 3* (2020), <https://www.fdic.gov/analysis/household-survey/2019report.pdf> (49% of respondents among unbanked households indicated that they did not have a bank account because they did not have enough money to meet minimum balance requirements; 66% of respondents indicated that bank fees were either too high or too unpredictable). Both fees and minimum balance requirements arise because the bank must recoup the costs associated with

maintaining a deposit account. Obviously, the provision of payment services through the Fed would also entail costs. If the Fed did not pass on these costs to consumers in the form of fees or minimum balance requirements, then its remittances to the Treasury would be reduced, and so taxpayers in general would be underwriting the provision of such services. Such fiscal support for the unbanked should require Congressional authorization, and it is unclear how cost-free Fed accounts could be limited just to those with the inability to pay for them. Another related reason advanced for a CBDC is the possibility of using Fed accounts to distribute federal benefits, such as welfare payments, tax refunds, or most recently COVID support funds. However, the swift distribution of substantial amounts of federal benefits is demonstrably feasible without the creation of a CBDC. In particular, the federal government distributed over \$1 trillion in COVID-related benefits without a CBDC, including to persons without bank accounts through such methods as privately managed pre-paid cards. See HOWELL JACKSON & TIMOTHY G. MASSAD, THE TREASURY OPTION: HOW THE US CAN ACHIEVE THE FINANCIAL INCLUSION BENEFITS OF A CBDC NOW (2022), <https://www.brookings.edu/research/the-treasury-option-how-the-us-can-achieve-the-financial-inclusion-benefits-of-a-cbdc-now/>. Moreover, if the government sought to facilitate the distribution of government benefits, a CBDC would not be necessary to do so, as the government could do so through Treasury accounts. See *id.* The Consultation Paper notes the potential existence of a narrower use case for a CBDC designed for “large value institutional payments . . . not widely available to the public.” We believe that such a use case warrants further study. Consultation Paper at Note 19.

*4. How might a U.S. CBDC affect the Federal Reserve’s ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

It has been suggested that a benefit of a CBDC would be to enhance monetary policy through the ability to directly pay interest on a CBDC, or to charge interest on CBDCs as part of a negative interest rate policy, neither of which is practically possible with physical currency held outside of bank accounts. These features could also be characterized as a “defensive” rational, insofar as cryptocurrencies or stablecoins could make monetary policy more difficult to conduct if holdings of cryptocurrencies and stablecoins become sufficiently large. However once again, if the government believes that cryptocurrencies or stablecoins pose a legitimate threat to monetary policy, the more direct response would be to prohibit or highly limit the growth of cryptocurrencies or stablecoins. One might also consider whether the introduction of a CBDC would make monetary policy more effective in its own right, setting aside any concerns with cryptocurrencies or stablecoins. There seems to be little benefit from being able to pay positive interest on CBDC liabilities, whether held in direct Fed accounts or through wallets, because paying interest on bank reserves or contracting or expanding the money supply are sufficient to establish interest rate targets. Moreover, imposing negative rates on a CBDC could help implement negative rate targets only if such rates could not be avoided by CBDC holders transferring out of their CBDC holdings into cash or bank deposits, where such negative rates did not exist. In effect, this would require abolishing or highly restricting the use of cash. As long as cash plays an important role in the payments system, this would be difficult to accomplish. Although recent studies indicate that cash use in most countries, including the United States, is declining (Tanaï Khiaonarong, David Humphrey, Falling Use of Cash and Demand for Retail Central Bank Central Currency (IMF Working Paper WP/22/27, 2022), <https://www.imf.org/en/Publications/WP/Issues/2022/02/04/Falling-Use-of-Cash-and-Demand-for-Retail-Central-Bank-Digital-Currency-512766>; Gregory Baer, Central Bank Digital Currencies: Costs, Benefits and Major Implications for the U.S. Economic System 5 (BPI Staff Working Paper, 2021), [https://bpi.com/wp-content/uploads/2021/04/Central-Bank-Digital-Currencies-Costs-Benefits-and-Major-Implications-for-the-U.S.-Economic-System.pdf?utm\\_source=media&utm\\_medium=email&utm\\_campaign=cbdc&utm\\_content=invite%2011](https://bpi.com/wp-content/uploads/2021/04/Central-Bank-Digital-Currencies-Costs-Benefits-and-Major-Implications-for-the-U.S.-Economic-System.pdf?utm_source=media&utm_medium=email&utm_campaign=cbdc&utm_content=invite%2011)), under current conditions such a prohibition would potentially interfere with the legitimate use of cash for small payments, particularly by the unbanked.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

It has also been suggested that a CBDC would increase financial stability by providing its holders with an asset that, unlike a bank deposit, is “unrunnable” - that is, a CBDC would not be subject to the risk that a sudden and severe spate of withdrawals would make a depositor’s CBDC funds unavailable. However, the effect of the availability of such an “unrunnable” asset, if held in substantial amounts, could be to undermine severely the critical role of the banking system in allocating capital. Most particularly, in a crisis scenario the availability of a CBDC may threaten the stability of the banking system by driving bank account holders to transfer their assets from bank deposits to CBDC (i.e., Fed accounts), thus spurring a bank run. In this respect, what might appear to be a benefit of a CBDC could

in fact be a significant cost.

6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?

7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?

8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?

9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?

One of the main reasons offered in support of a CBDC is that a CBDC could improve the retail payment system to allow faster payments. However, such payments can already be efficiently made today through debit and credit cards, or through platforms like Venmo and Zelle. The private sector is continuing to provide new alternatives and the Fed is nearing the deployment of its FedNow service. While some have criticized the existing private payment system, specifically those provided by VISA and Mastercard, as anti-competitive due to the charging of interchange fees, it is hard to argue that the market would function better with a further expansion of government, through the Fed, in the payment system. Indeed, various commentators cast doubt on the utility of a CBDC as an indirect check on interchange fees and argue that if the government seeks to moderate interchange fees, that objective is better served by direct regulation. See David Andolfatto, On the Necessity and Desirability of a CBDC 6 (2021), [https://gceps.princeton.edu/wp-content/uploads/2021/11/21oct\\_Andolfatto-paper\\_CBDC4US.pdf](https://gceps.princeton.edu/wp-content/uploads/2021/11/21oct_Andolfatto-paper_CBDC4US.pdf); Gregory Baer, Central Bank Digital Currencies: Costs, Benefits and Major Implications for the U.S. Economic System 5 (BPI Staff Working Paper, 2021), [https://bpi.com/wp-content/uploads/2021/04/Central-Bank-Digital-Currencies-Costs-Benefits-and-Major-Implications-for-the-U.S.-Economic-System.pdf?utm\\_source=media&utm\\_medium=email&utm\\_campaign=cbdc&utm\\_content=invite%201](https://bpi.com/wp-content/uploads/2021/04/Central-Bank-Digital-Currencies-Costs-Benefits-and-Major-Implications-for-the-U.S.-Economic-System.pdf?utm_source=media&utm_medium=email&utm_campaign=cbdc&utm_content=invite%201). The Fed has in fact already implemented regulations limiting debit card interchange fees: Section 1075 of the Dodd Frank Act (also known as the Durbin Amendment) requires debit interchange fees charged by issuers with \$10 million or more in assets to be "reasonable and proportional to the cost incurred by the issuer" and authorizes the Fed to issue implementing regulations. Dodd-Frank Wall Street Reform and Consumer Protection Act § 1075, 15 U.S.C. § 1693o-2(a)(1). The regulations issued thereunder limit debit interchange fees received by such issuers to 21 cents plus 0.05% of the transaction value. 12 C.F.R. § 235.3 (2021). Moreover, a CBDC system would not be without its own unique transaction costs: for example, the intermediaries and wallet providers necessary for a functioning CBDC payment system would presumably require monetary compensation for their services. It is also argued that CBDCs would facilitate more efficient cross-border payments for retail customers. However, very little concrete research exists on how a CBDC would remedy the problems with cross-border payments. One line of argument revolves around the high cost of remittances. It remains unclear however precisely how as a technical matter a CBDC could reduce such costs. Further, a major portion of the cost of cross-border payments consists of currency conversion costs. Indeed, the reduction of currency conversion costs was a major reason for the adoption of the Euro. It remains to be seen how a U.S. CBDC, possibly in conjunction with CBDCs in other jurisdictions, could reduce such costs. Moreover, there have been detailed proposals for the facilitation and optimization of cross-border payments that do not involve CBDCs or other cryptocurrencies. See Ulrich Bindseil & George Pantelopoulos, Towards the holy grail of cross-border payments (2022), [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=4057995](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4057995). Alternatively, if the decision were made not to charge for the cost of remittances, then that would be a financial inclusion issue, which is addressed in the paragraph below, and not related to enhanced efficiency of cross-border payments involving CBDC.

10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?

11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Another purported benefit of a CBDC would be to limit tax or AML avoidance that can currently be achieved through the use of cash. This benefit assumes that cash would be outlawed or substantially limited in conjunction with the creation of a CBDC. Without such a prohibition or limitation, persons seeking to circumvent tax and AML laws would likely avoid the CBDC and continue to use cash. No blueprint has been advanced as to how such a prohibition or limitation could practically be achieved without unduly affecting the legitimate use of cash for small payments, particularly by the unbanked. Furthermore, there would be a major concern with the loss of privacy that could follow from mandated use of a trackable digital currency. While a CBDC system could be designed to limit the ability of the government to monitor the use of the CBDC, these limits would then conflict with the goal of curtailing illegal activity.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

I think programmability is the biggest potential benefit. By issuing a token-type CBDC using a blockchain, it will be possible to give attributes to the money itself without having to link and manage the attribute information separately, and it will be possible to program with only the information that the money itself has. For example, it is possible to incorporate processing such as how much interest is set for deposits from a certain company in a program, and processing such as raising the lending interest rate if a loan is overdue. There is a possibility of becoming. In addition, even in the individual company analysis of the balance sheet in the bank, it will be possible to analyze and simulate only the money information without linking the attribute information from another record. Payment and billing efficiency can be improved by having transfer and benefits with various conditions and commercial distribution information.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

I think it can be achieved by combining wholesale CBDC and private digital currencies. In other words, the central bank may issue a wholesale CBDC to private banks, and the private banks may issue token-type private digital currencies using blockchain in proportion to it.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Yes, I think so. However, I think that the degree of influence on financial inclusion varies from country to country. I think developing countries are even more effective, but I think the net effect is also positive in the United States.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

I don't think there is a direct impact on employment. In terms of price and price stability, I think it depends on how the CBDC is supplied. For example, if you send CBDC directly and the speed of money circulation increases, inflation may occur.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

I think it depends on the issuing method. Even if the issue is issued in a two-tiered structure without interest, I think that the withdrawal of CBDC to an individual will differ depending on whether it is a bank deposit match or a cash match. In the case of bank deposit matchmaking, the credit creation function may be reduced. However, even though the CBDC has more means of controlling financial measures, I think the net effect of fiscal stability is rather positive.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

I think it depends on the issuing method. If it has a two-layer structure and no interest, it will not have much effect. Especially when private financial institutions issue private bank digital

currencies in proportion to CBDC, it is possible to provide additional services (services that utilize the programmability of private bank digital currencies) without negatively affecting the financial sector.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

I think it's important for a certain period of time. I think we will make a decision while looking at the degree of decrease and trends in usage.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Although payments can still be made without the CBDC, when each country issues digital currencies and the infrastructure for exchanging the digital currencies of each country is in place and transactions are activated there, the United States will settle with other countries. I think there is a possibility that it will be disadvantageous in.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Decisions made by other large economies, especially those with large trade volumes, will influence the decision to issue in the United States. Also, from a political point of view, I think that trends in China in particular have a great influence on the judgment of the United States.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

One method is to maintain complete anonymity when issued by the central bank, and to provide additional services after being paid out to a private financial institution, depending on the business and service characteristics of the user. Originally, I think there is a way to provide it in a way that does not guarantee complete anonymity.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Cyber risk is an important point, but there is also a balance between cost and development cost.

*14. Should a CBDC be legal tender?*

I think it needs to be legal tender. (I thought that was also a definition.) If it is not legal tender, it may not be possible to tell the difference from private digital currency.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

I do not think. We believe that paying interest will create a preference and will have a greater impact on the financial sector, including the shift from private deposits.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Given the outflow of private bank deposits and financial stability, we believe it is necessary to limit the quantity at least initially. I think you should consider changing the limit value as necessary while observing the situation after introduction.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

I think it is a private financial institution or a non-bank section or a fintech company. I think we should introduce regulations that set guidelines for a certain line while ensuring a certain degree of free competition and service provision. On the other hand, it should be avoided that too different levels of regulation between intermediaries would hinder fair competition.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

I don't think it's necessary. I don't think it's worth the cost comparison and the double tracking of functional design. For the time being, assuming a world where CBDC and cash coexist, even if electricity is cut off, it is possible to temporarily return to cash payment, so offline payment will be used from the beginning of the introduction of CBDC. I think there is little need to prepare a system or system to do this.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

I think it is necessary to design for ease of use. I think it should be designed with an easy-to-use UI for smartphone apps.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

It would be nice to be able to design an intervening protocol that standardizes the transfer method for multiple payment platforms.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

It is necessary to provide universal value, and in principle, it should be designed so that it can be operated continuously even if technological innovation occurs. On the other hand, it is not always possible to see what kind of technological innovation will occur in the future, so I think we have to select designs and policies within the range where we can see the current situation to some extent.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The paper makes a good case for CBDC as a digital form of fiat money, which would be a public good for the digital age. It would be a safe, efficient, inclusive, final and instantaneous means of settlement. Policy considerations and risks are well covered in the paper. CBDC created as a cash equivalent in many ways will have trade-offs in benefits and risks very much like cash has inherent benefits and risks. Hence, it's important to define functional, security and policy requirement first, before settling in on technology. Technology should then be applied to meet the challenges of functional, security and policies mandates.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

No. Demand for digital payments is growing exponentially. In the absence of CBDCs, private digital money (cryptos, stablecoins and e-money) will fill the void. However, they are unregulated, private or even nobody's liability, with accompanying credit and settlement risk. They operate within large closed networks, which can limit competition and can be highly speculative. They could result in monetary and financial instability and, to the extent they are used for cross-border flows, could be further destabilizing. As such, the appropriate policy response must be two-fold – regulate private digital money and launch CBDC. Other solutions such as faster payments and novel apps are all built upon century-old infrastructure and half-century-old technology which relies on account (or ledger) based systems. This very infrastructure that relies on bank accounts, credit cards, debit cards, wire transfers, payment systems and payment apps have only further reinforced financial exclusion. CBDC is an opportunity to reimagine the possibilities of a more digitally/financially inclusive future.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

CBDC would be highly beneficial for financial inclusion. An interoperable payments system using CBDC would ensure that the unbanked can have access through a multitude of access points and the ability to effectuate efficient, cost-neutral and life-enhancing transactions. The efficiency gains and the elimination of friction alone will ultimately improve quality of life. A key consequence would also be more information-based lending by banks and non-banks and expanding markets to boost financial inclusion. Gains would derive from expanded reach and commerce, especially for small businesses, as CBDCs are not limited by the denomination structure of banknotes and, being digital, unlike cash, are not limited by geographical considerations.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

CBDC would help preserve monetary sovereignty. Monetary policy formulation could be strengthened by the generation of real-time data through the use of CBDCs. They could also be a helpful fiscal tool to ensure that spending on social programs reached their targeted recipients quickly, at low cost and with minimum leakage.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

CBDC would be positive for financial stability in two ways. First, by using CBDC, the public could transact using a risk-free instrument, which is a liability of the Fed. Second, to the extent that the advent of CBDC reduced the use of cryptocurrencies and stablecoins, they would also be highly beneficial for financial stability.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Concern has been expressed that CBDCs could lead to a reduction in bank lending as a result of an outflow of bank deposits into CBDC accounts or wallets and banks' funding costs could rise. Many also fear that by providing an easy way to convert bank deposits into a safe government-backed asset, CBDCs could destabilize the financial system by facilitating and accelerating bank runs during crises. This would have a different impact on the financial sector relative to stablecoins or other nonbank money. However, these concerns are overstated in a modern money creation view of banking. Banks also have access to non-deposit funding sources. Trust in banks is derived from deposit insurance, regulations, and supervision, backed by their providing value-added services. These do not change in a post-CBDC world. It should also be noted that retail users can already switch funds out of the banking system instantaneously, into money market funds or government securities. Meanwhile, the rise of capital markets over the past few decades has not undermined money creation and credit expansion by banks, and has been highly positive for the US economy.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

The concerns can be mitigated by tools such as limits on CBDC transaction sizes and wallet holdings as well as non-interest bearing or tiered remuneration structure for CBDC balances depending on their size. These tools should not diminish the potential benefits of a CBDC.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

It is essential to preserve public access to central bank money through a CBDC for reasons mentioned earlier.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

They would evolve utilizing private digital money, with attendant risks and concerns, including financial stability, loss of monetary sovereignty and potentially destabilizing capital outflows. The mere introduction of additional private money in domestic and cross-border payments will only exacerbate counter party, settlement, and macro instability concerns.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The US should be monitoring what other large economy nations are doing. While they are all engaged in various stages of CBDC exploration, the decision whether to issue a CBDC in the US should ultimately be driven by whether it makes practical and economic sense to do so. Other factors such as US technological leadership, role in standards setting, security, and the US dollar as a widely held settlement instrument have all been discussed elsewhere.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Monetary operations may need adaptation, but CBDC should not affect monetary policy transmission significantly. Transmission could even strengthen if CBDC spurs greater financial inclusion. As such, there should be limited monetary policy and inflationary implications of CBDC as asset prices/collateral values/exchange rates are not altered, while existing policy-setting arrangements are maintained.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

By designing the CBDC as a digital bearer instrument, analogous to physical cash, which is delinked from the identity of the holder of CBDC wallets, privacy for consumers would be protected. Moreover, although the CBDC may not provide the same degree of anonymity as cash, it must adhere to privacy laws, applicable to both the government and payments

intermediaries. To preserve privacy, the central bank should not know the identity of CBDC users, unless the transaction size is above a certain threshold set by law or as a result of a legal discovery process, in accordance with existing practices. It is also important that financial integrity should be strengthened, while not burdening the central bank with operational headaches. This could be done by requiring CBDC transactions to be done through payment intermediaries subject to anti-money laundering (AML), know-your-customer (KYC) and counter-terrorism financing (CTF) regulations.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Design is key for the success of CBDC for general purpose use. Operational and policy considerations suggest that an 'intermediated' and 'cash-like' CBDC model be followed in the US. The Federal Reserve provides the core CBDC instrument, including issuance, distribution, and withdrawal from circulation. The CBDC is distributed through bank and nonbank financial intermediaries for use across all payment rails. The operational requirements call for achieving required scale, speed, finality of settlement, security, privacy and interoperability. The design needs to allow flexibility to connect with all payment rails. It should be highly energy efficient as well to reduce the carbon footprint. The private sector can build and operate the payment systems and continue to innovate wallets, access channels and so on. Compliance with anti-money laundering and know-your-customer regulations is done by the payment service providers, and privacy preserved for small transactions. Interoperability and competition are assured. For the security and resiliency of the CBDC and making it quantum resistant, the use of both hardware and software cryptography in line with the highest national security standards is needed. Financial intermediaries are responsible for looking after operational and cyber risks for their individual payment rails. This is the architecture being implemented in Jamaica's CBDC. This approach eschews the 'direct' model, where the CBDC is operated by the central bank, which keeps a record of balances in a central ledger and may also handle payment services. While the direct model is a possibility for a CBDC in the US, operational and policy considerations would rule it out. Building and operating the payments network would be a challenge for the Federal Reserve and costly. It would also have the operational headache and cost of managing hundreds of millions of accounts. The Federal Reserve does not have the legal authority to offer direct accounts to individuals. Having to handle customer relationships means that privacy may not be assured.

*14. Should a CBDC be legal tender?*

Yes, to be a true form of public money alongside physical notes and coins.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

No, as indicated above to mitigate disintermediation concerns.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Yes, again to mitigate disintermediation concerns.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

CBDC intermediaries should be banks and nonbanks (payment service providers, mobile money operators), appropriately regulated.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes. End users will be able to use their CBDC even when they do not have telecommunication connectivity. This can be achieved by extending the CBDC as a digital bearer instrument, which can be validated on its own merit, into the secure elements of smart end user devices which can be feature phone, smart phone, chip cards or other appropriate user devices. Users with the proper device can continue to transact offline. However, the Federal Reserve may set limits on offline transactions for policy and monitoring reasons.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Jamaica's CBDC provides a good example of utilizing the 'intermediated' architecture, designed to maximize ease of use and point of sale acceptance. The Bank of Jamaica is minting, issuing and distributing the Jam-Dex (CBDC). Banks and payment-service providers interface through standard APIs. Households, businesses and merchants can access through their CBDC wallet. Jam-Dex is

interoperable across all payment rails, utilizing existing infrastructure, which ensures competition with universal access and availability in Jamaica. It is integrated with Jamaica's RTGS system. The core CBDC instrument is secured by the Bank of Jamaica using hardware and software to make it quantum resistant. There is another layer of security provided by customer-facing private sector wallet providers. The design preserves privacy vis-à-vis the authorities by delinking the identity of the holders of Jam-Dex from the instrument. The architecture calls for private sector wallet providers to innovate on products and services, using the Jam-Dex.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

The digital bearer currency instrument using the 'intermediated' model is designed to achieve transferability across multiple payment platforms, while delivering on scale, privacy, and financial integrity (identity verifiable). The technology breakthroughs and standards to achieve this have already been done.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

The above design is also fool-proofed in terms of future technological innovations, by separating the digital bearer CBDC instrument from the payment rails. In essence, the approach is a public-private partnership, where the central bank issues an innovative CBDC instrument, while the private sector continues to innovate in customer-facing applications.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

See earlier answers for design principles and tradeoffs.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Meta strongly supports the development and implementation of a well-designed U.S. Central Bank Digital Currency (CBDC) consistent with the policy goals outlined in the January 2022 paper, “Money and Payments: The U.S. Dollar in the Age of Transformation.” Specifically, Meta agrees that a U.S. CBDC should be intermediated, privacy-protected, widely transferable, supportive of the U.S. Dollar’s international role as the world’s leading reserve currency, and a means of increasing financial inclusion. A well-designed U.S. CBDC would yield at least three important benefits. First, it would support the stability, integrity, and efficiency of the U.S. monetary, financial, and payment system so as to promote optimal macroeconomic performance, including promoting an accessible, efficient, and interoperable payment infrastructure underpinned by a digital U.S. Dollar. Second, it would help preserve the U.S. Dollar’s role as the world’s leading reserve currency. Third, it would promote the United States’ leadership role and protect its own interests in advancing technology leveraged by CBDCs and the changes to the financial markets and industries that CBDCs are likely to result in. Meta believes that a well-designed U.S. CBDC should be open and interoperable to ensure that the greatest number of people and businesses can access the benefits it would provide. It should be open to a wide variety of intermediaries, including nonbank wallet providers, subject to appropriate regulation and supervision. It should be interoperable across different metaverse experiences, and have the ability to work with and support multiple blockchains, other CBDCs, stablecoins, commercial bank deposits, and other digital assets. Providing new financial access channels to more people through technological innovation will promote financial inclusion without adversely affecting the safety, soundness or stability of the U.S. financial system. In addition, a U.S. CBDC could build on current efforts—like FedNow—to improve the speed, integrity and accuracy of the government’s delivery of stimulus payments to Americans in times of economic crisis, such as a recession, financial crisis, or pandemic. A U.S. CBDC would facilitate the efficient delivery of these payments in a manner that is not only faster but also more accurate and secure than our current approach of issuing government checks and making ACH wire transfers. Finally, a U.S. CBDC would allow the government to provide more targeted relief to distressed households and businesses. For example, in the case of public benefits programs or conditional cash transfers, a U.S. CBDC could be designed to be programmable so that when combined with digital accounts, program administrators could target participants based on a variety of attributes and allow linking disbursements with federal beneficiaries’ completion of required actions. Programmability could also allow the government to better manage the consumption and use of these and other stimulus funds efficiently. Meta believes that it would be helpful to the U.S. financial regulatory agencies as well as players in U.S. financial markets if the U.S. Congress adopted authorizing legislation that also provides guidance for the Executive Branch on whether (and, if so, within what parameters) the Federal Reserve should develop and implement a U.S. CBDC, including guidelines on policy goals a U.S. CBDC and its design should support.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Skip.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Meta believes that a U.S. CBDC has the potential to improve financial inclusion and that a U.S. CBDC should be designed and implemented to promote financial inclusion as a policy goal. Payments and access to payment rails in the United States are currently too expensive. They can be prohibitively expensive for the unbanked, who make up 6.5 percent of U.S. households, or the underbanked, who comprise an additional 18.7 percent of U.S. households according to a 2017 Federal Deposit Insurance Corporation (FDIC) survey. Most of the unbanked and underbanked are low-income individuals and minorities who do not benefit from the economies of scale that enure to the benefit of those with high balances. Even for those with bank accounts, payments can be too expensive because of fees on checking accounts of people who cannot maintain high enough balances. Further, many unbanked individuals avoid bank accounts because of their distrust of the banking system or they cannot get access to the banking system because it is difficult for these individuals to comply with some of the requirements of the banking system, often resulting in their use of high-cost money transmitters. A U.S. CBDC could maximize financial inclusion by being open, interoperable, and widely accessible. To maximize financial inclusion objectives, a U.S. CBDC must be open to a wide range of intermediaries, including low-cost nonbank wallet providers that do not engage in maturity or liquidity transformation. It should be interoperable with multiple blockchains, other national CBDCs, stablecoins, commercial bank deposits, and other digital assets. Such a U.S. CBDC could give the unbanked, underbanked, and low-income Americans the ability to hold and transfer U.S. CBDC through the channels that they have easy access to and consider to be convenient and trustworthy, which may include digital wallets accessible through smartphone applications. Indeed, we anticipate smartphone applications will play an increased role in improving financial inclusion: for example, according to the 2019 FDIC survey, 6 out of 10 unbanked households had access to smartphones (up from 5 out of 10 unbanked households in 2015). In addition, according to the 2017 FDIC survey, more than 8 out of 10 underbanked households had access to smartphones. As the Federal Reserve and governments around the world design CBDC with financial inclusion objectives in mind, innovative digital ID solutions should be part of the CBDC efforts. Globally, more than one billion people do not have proof of their identity through traditional means, creating barriers to access in the formal financial system for many. Leveraging technology to perform reliable and efficient know-your-customer (KYC) review is essential to bringing these people into the financial system and bolstering financial inclusion.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Skip.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Skip.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Skip.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Some researchers investigating the implications of CBDCs have suggested that the introduction of a U.S. CBDC adds risks to the financial system during times of economic stress because commercial bank depositors would be able to transfer their money instantaneously and cheaply from their commercial bank accounts to a U.S. CBDC. Currently, such depositors are limited to moving cash balances from weak banks to strong banks, or withdrawing physical cash and putting it under the proverbial mattress. Meta believes that the risk of such runs on the commercial banking system could be mitigated by design choices that will make CBDC a medium of exchange rather than a significant store of value. For example, the federal government could impose limits on the amount of U.S. CBDC that could be held by an individual, imposing caps on the amount of interest that can be paid on a U.S. CBDC, or by implementing a "tiered CBDC" regime where the interest rate paid decreases as the amount of U.S. CBDC an individual holds increases.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Meta believes that it is important to preserve the general public's access to a form of central bank money that can be widely used for payments, especially during times of financial

distress. The general public currently has access to money that is legal tender in the form of metal coins produced by the U.S. Mint and paper Federal Reserve notes. But the amount of physical cash used to settle transactions has declined dramatically in recent years and as more payments activity moves online, it is important to provide consumers and businesses with a digital public money alternative to physical cash, such as a U.S. CBDC. Merchants increasingly prefer credit cards, smartphones and other forms of private payment instruments over public money in the form of physical cash. They do not distinguish between commercial bank money and public money when the economy is expanding. But when the economy is contracting, these merchants may only be willing to accept public money as payment for goods and services. As a result, Meta believes that developing a U.S. CBDC is essential as the use of physical cash continues to decline. A U.S. CBDC would be a more efficient and safer way to preserve the general public's access to central bank money during times of financial stress than stockpiling large amounts of physical cash, thereby protecting consumers and the integrity of the U.S. Dollar.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

In the absence of a U.S. CBDC, domestic and cross-border digital payments are likely to continue to evolve through private solutions and public sector initiatives, such as FedNow. Regulatory frameworks are already emerging to support the potential for private sector solutions to continue to grow. However, one aspect that is central to those regulatory proposals is the question of reserve composition. So, while private sector solutions could address some of the existing challenges and inefficiencies in payments, consumer preferences and risk appetites are not homogenous. One quality that a retail U.S. CBDC has that other solutions will not have is that there will never be any question about the stability of a U.S. digital dollar issued by the Federal Reserve, or the reserve composition supporting that value. Internationally, work to develop CBDCs is already underway, including at the Bank for International Settlements, where teams are considering standards for cross-border interoperability for national CBDCs. Other countries are developing prototypes for interoperable wholesale CBDCs without input from the United States. The main hurdle these CBDC prototypes face reportedly relate to technical interoperability. Coordinating technology and messaging standards is complex and Meta believes the United States should take a leadership role in the discussions about technical and regulatory harmonization related to data, privacy, tax and payments laws and capital flow management measures. As outlined in more detail in response to Q10 below, the participation of the United States in these discussions would help shape standards, design choices and implement policies that are consistent with American policy objectives. In the absence of American leadership, other nations will forge ahead and fill that leadership role in a way that could be detrimental to the interests of the United States.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Meta believes that the United States should introduce a well-designed U.S. CBDC without regard to whether other large economy nations have yet issued their own. The development and implementation of such a U.S. CBDC would place the United States in a better position to preserve a leadership role in shaping innovation, as well as the regulations and protections that are necessary to promote the stability, integrity, and efficiency of the U.S. Dollar and the United States' payments system. If the United States does not assert this leadership role, several risks could materialize. These include: (1) significant innovations in this area may take place outside, and independent of, the United States; (2) the United States' payments infrastructure may fall behind or be incompatible with new payments rails; (3) other countries' introduction of a well-designed and widely used CBDC could weaken the U.S. Dollar as the world's leading reserve currency, giving rise to national security and economic competitiveness concerns. Because technological upgrades are progressing at a rapid pace and are achieving increasing levels of adoption without regard to whether the United States or other large economy nations, including the United States, have yet issued a CBDC, Meta believes that U.S. central bank money should be able to interact with these new technologies, consistent with appropriate regulation. However, Meta also believes that the United States should engage with other nations on how best to implement a CBDC. U.S. regulators should engage with their foreign counterparts and develop a mutually beneficial recognition framework that permits the U.S. CBDC to be utilized globally as the U.S. Dollar is today. Meta recognizes the potential complexity of such arrangements, but also notes that the principle of "substituted compliance" or "equivalence" are well-established methods of international cooperation and recognition in regards to financial regulation.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Skip.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

A U.S. CBDC should be designed to strike an appropriate balance between privacy interests and preventing illicit financial activity. Consumers and businesses should be provided with the same option to hold and transfer a U.S. CBDC with appropriate protections on financial and personally identifiable information, subject to Anti-Money Laundering/Combating the Financing of Terrorism (AML/CFT) reporting requirements, as in our current system. While several technologies are either now available or in development that can enhance a CBDC's privacy protections while maintaining compliance with anti-financial crimes laws, balancing privacy concerns depends in large part on a decision regarding who will be responsible for implementing AML/CFT controls. If this responsibility rests with the Federal Reserve, it would be difficult to adequately implement AML/CFT controls without government access to more personal and financial information. A U.S. CBDC need not compromise privacy or security if the U.S. CBDC is designed with that in mind and privacy considerations are at the forefront of decisions regarding intermediation and the responsible parties for the implementation of AML/CFT controls. For example, while there are valid privacy concerns about digital identity and authentication services, such as facial recognition systems, Meta believes that these services could be designed to facilitate compliance with financial and legal obligations without compromising privacy. Meta believes that the U.S. Congress should determine how to appropriately balance policy goals and related risks of a U.S. CBDC. Congress should adopt legislation that provides guidance to executive branch agencies and market innovators as they develop, implement and regulate these new financial instruments. Meta supports regulations and policies that encourage development of privacy enhancing technologies and strong privacy-by-design approaches that also allow for privacy-respecting law enforcement access.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Skip.

*14. Should a CBDC be legal tender?*

Meta believes that a future U.S. CBDC should be added to the list of payment instruments that are defined as legal tender in 31 U.S.C. 5103, and therefore required to be accepted in satisfaction of any tax obligations and for any private obligations that are denominated in U.S. Dollars. Defining certain payment instruments as legal tender plays an important role in anchoring the concept of money. Being legal tender would ensure that a U.S. CBDC would be more widely used and transferrable, including at the point of sale. By requiring any U.S. CBDC to be accepted in satisfaction of any tax obligations and for any private obligations that are denominated in U.S. Dollars, the general public would be more likely to use the U.S. CBDC in practice, enhancing its credibility and adoption further. Congressional authorizing legislation or implementing regulations for a U.S. CBDC could include a transition period to assist businesses and individuals.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Skip.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Skip.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Meta believes that both depository and non-depository institutions that are subject to appropriate supervision and regulation should be able to serve as intermediaries, including nonbank wallet providers, for a U.S. CBDC. Allowing a broad range of institutions to serve as intermediaries, including nonbank wallet providers, for a U.S. CBDC would foster competition among intermediaries and access channels, which would drive innovation, customer service and customer choices, without in any way compromising the safety, soundness or stability of the United States' financial system. Innovation and competition would be expected to drive down the price of access to the payments system, thereby reducing one of the major impediments to financial inclusion among low-income individuals. Different types of entities

present different strengths, and competition between a broad range of entities will ensure that appropriate modes of access and payments channels are developed to meet the needs of the general public and businesses alike. In furtherance of financial inclusion aims, intermediaries should commit to demonstrating inclusion as a principle in their business models.

Technologically innovative, robust, and AML/CFT regulation-compliant technology solutions for customers who may not have access to standard KYC documentation should also be encouraged.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Meta believes that only a U.S. CBDC that has offline capabilities would best serve and promote the stated policy goals, specifically that it be widely transferrable and increase financial inclusion. Offline capabilities will promote financial inclusion because certain segments of the general public do not have access to online payments, and some have no internet access at all. Meta believes that a U.S. CBDC should have offline capabilities to keep those without access to online services connected to the payments system. In addition, offline capabilities promote the policy of wide transferability in periods when there are unexpected power or internet outages.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Meta believes that only a U.S. CBDC that is designed to maximize ease of use and acceptance at the point of sale would best serve and promote an accessible payments system and an efficient and accessible U.S. Dollar. People are not normally concerned about using commercial bank or central bank money; they prefer to use money in the form that is most useful, efficient and inexpensive to transfer. This includes being widely accepted at the point of sale. A well-designed U.S. CBDC that is open and interoperable, with a wide variety of intermediaries, and incorporates simple yet strong identification surely, would maximize ease of use and acceptance at the point of sale. Moreover, maximizing ease of use and acceptance at the point of sale would help promote an increase in financial inclusion because low-income individuals spend proportionally more of their income on necessary goods. Without the ability to use a U.S. CBDC, whether from earned income or from government assistance, a U.S. CBDC will offer no assistance to those most in need. Small businesses rely on a high volume of small value transactions and would benefit from being able to accept a U.S. CBDC. Similarly, a U.S. CBDC that is not easily used and accepted at the point of sale would have limited international appeal. Any U.S. CBDC designated as legal tender, as Meta believes it should be, would be a misnomer if it could not in fact be easily used to discharge one's obligations, including at the point of sale.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Meta believes that the infrastructure necessary to support a U.S. CBDC's interoperability can take one of two approaches: (1) formal interlinking connections between intermediaries and payment systems that permit funds to be transferred from one intermediary or system to another; and (2) intermediaries offering services in multiple underlying payment systems such that transfers of balances between payment systems are handled internally by the intermediary where no formal interconnection exists between the payment systems. For example, an intermediary that offers (and is licensed to offer) services using multiple underlying payment systems could process a payment by debiting the sender's commercial bank money balance and crediting the recipient's U.S. CBDC balance. Meta further believes that new technical standards may be needed to support such interoperability and that the U.S. government should support efforts to develop these standards, both through private sector channels, as well as efforts underway at international standard-setting bodies. These standards should include technology standards as well as data standards, including messaging standards such as data fields in payment instructions to identify a recipient's wallet address or account number, as applicable, throughout the payment chain, no matter the intermediary or payment system used by the recipient. Meta notes that private efforts to create technology and data standards are presently underway in the digital asset ecosystem. For example, standardization of token specifications has already permitted significant innovation and interoperability. Meta believes that the United States should play a significant role in developing and shaping these standards so that they best serve and promote U.S. policy goals. These technology standards could include the standardization of anti-money laundering, criminal or terrorist financing, know-your-customer and sanctions monitoring and reporting capabilities and requiring that they are built into intermediary's products and the payment rails. Moreover, current regulatory requirements and methods for cross-border data sharing will require a reassessment. If the United States does not play such a role in helping industry and standard-setting bodies develop these standards, the standards that emerge

may not serve the national security and policy goals of the United States. Worse, if the U.S. Dollar was incompatible with technology and messaging standards developed and implemented by other countries, this could put at risk the stability, integrity, and efficiency of the United States' monetary, financial, and payment system.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Meta believes that technological innovations in this space will follow once the Federal Reserve and the U.S. government provide guidance in the form of design choices that weigh potentially competing policy prerogatives. Technology should not be considered a limiting factor to policy choices; instead, policy choices will shape what technological innovations are required for a U.S. CBDC if they do not yet exist. In a future use case, we can imagine CBDC serving as a widely accessible digital currency that facilitates access to virtual experiences in the metaverse for diverse individuals who may not be able or interested in holding other virtual assets. CBDC could allow these individuals to move their digital dollars from their virtual wallets to unlock experiences, education tools or digital goods in a virtual environment, and then to exit or transfer from one virtual world into another through the use of their digital dollars.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Meta believes that both interoperability and an open system are most vital to best serve and promote the stated policy goals and the potential benefits of a U.S. CBDC, both with respect to traditional payment rails and the emerging digital economy. With respect to both, this means ensuring any U.S. CBDC should be technology neutral and that the system is open to a range of licensed intermediaries, including nonbank wallet providers, subject to appropriate supervision and regulation. Meta believes that while certain tradeoffs may exist between policies, particularly between privacy and national security concerns, these tradeoffs are not new or specific to a U.S. CBDC and the design of any U.S. CBDC would reflect these tradeoffs.

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*Name or Organization*

Merchant Advisory Group

*Industry*

Trade Organization

*Country*

United States of America

*State*

Minnesota

*Email*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

A CBDC must address the lack of competition in the domestic U.S. payments system, which has led to high fees and comparatively low quality. By offering maximum flexibility on who can participate in the storage and transfer of a reliable, safe, cash-like CBDC, the Board could meaningfully foster payments competition and thereby lower costs, improve quality, and increase public access to the U.S. digital payments ecosystem. Currently, debit and credit cards comprise the vast majority of digital payment transactions at U.S. merchants.

Merchants and consumers incur high costs for these transactions. When a consumer uses a credit or debit card to complete a purchase, payment card networks like Visa and Mastercard and their issuing banks charge the merchant interchange and network fees to process the payment. Those fees have risen sharply, particularly on digital transactions. Between 2009 and 2025, merchants' overall costs of acceptance will have doubled, much of it driven by rising fees and increased use of payment types—such as mobile or virtual card transactions—which the payment networks charge even higher fees to process. This increase in merchant-side fees has occurred despite lower issuing bank costs for card transactions. The resulting increased disparity between processing costs, interest expenses, and fees charged to merchants underscores that the payments markets are not functioning properly in the U.S., where merchants pay some of the highest acceptance fees in the world. This April, in the midst of continued pandemic disruptions and rising inflation, Visa and Mastercard implemented rate changes estimated to cause a \$1.2 billion increase in acceptance fees disproportionately affecting digital transactions. Because they operate in highly competitive, low-margin environments, merchants must pass these fees on to consumers in the form of higher retail prices. The current marketplace lacks the competition necessary for the free market to set appropriate pricing. This lack of competition has harmed U.S. consumers and the economy. In recently intervening to block Visa's acquisition of Plaid, which provides "pay-by-bank" technology that could allow U.S. consumers to pay instantly for goods and services directly from their bank accounts, the Department of Justice noted that Visa has a durable 70 percent share of the online debit market, resulting in what the Department of Justice described as "monopoly power." The creation of a CBDC should foster competition by enabling other avenues for value to be transferred when an electronic transaction occurs. In a functioning payments market, competition leads to innovation, which includes lower fraud. Today, the majority of card fraud is concentrated in card-not-present transactions including ecommerce. The Board has an opportunity to build a CBDC with enhanced security tools and features to prevent and reduce fraud. This in turn would encourage other market participants to drive efforts to meaningfully reduce fraud in the system. A CBDC could bring greater competition to the payments industry to improve innovation and lower transaction costs. This is in keeping with the president's recent Executive Order, which encouraged the Board to analyze how "CBDCs could improve the efficiency and reduce the costs of existing and future payments systems." In keeping with this Order, it is imperative that the Board implement a CBDC in a way that maximizes competition and drives down costs in the existing U.S. payments system. A set of CBDC design principles should be adopted that would fully open the market for CBDC services and maximize users' ability to freely store and transfer value. By adhering to those design principles, the Board could modernize the U.S. payments system while addressing high domestic and cross-border payments fees.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

A CBDC would be the ideal approach to improving and complementing the U.S. payments ecosystem. A well-designed and implemented CBDC could quickly improve the U.S. payments system and meet the growing digital payments needs of consumers. This can be accomplished in a way that complements and enhances the existing financial sector. As a currency directly issued by the Federal Reserve, a CBDC would address the demand for an efficient digital currency. First, CBDCs are well-suited to the digital way that consumers store and transfer their money, enabling digital transactions to clear instantly and reliably. As discussed above, the current status quo leaves as the dominant option for paying for goods existing bank-based payment networks which are relatively slow (taking days for settlement), inefficient, and costly. Indeed, the growing adoption and use of stablecoins and other cryptocurrencies demonstrate the demand for more efficient ways to store and transfer digital value. Notwithstanding implementation of a CBDC, the MAG supports the Board's and other agencies' ongoing work to ensure that stablecoins are properly regulated so that their advantages to the U.S. payments ecosystem are realized and their risks minimized. The ability for a CBDC to effectuate secure and real-time payments could spur competition and innovation in the financial sector. As the discussion paper states, faster payment alternatives hold promise to reduce the costs of "lower-value payments," while noting that "the costs and fees for certain payment methods (e.g., card transactions) may remain comparatively high for some parties to the extent that instant payments do not serve as a close substitute for those methods." Deployment of a CBDC could address the Board's perceived limitation of faster payments, potentially reducing the costs of all transaction values. Without a CBDC that promotes competition and innovation in the retail payments sector, including, to the extent the CBDC is intermediated, allowing more types of commercial entities to serve as intermediaries, U.S. merchants will continue to pay some of the highest costs of acceptance in the world while continuing to shoulder some of the highest rates of fraud. As the use of traditional cash decreases, payment card networks and banks will likely continue to increase fees for digital purchases, where competition is most limited. But a CBDC that provides a viable alternative means of transferring legal tender would immediately enhance competition.

A CBDC that spurs competition and innovation in the payments industry should be considered complementary to the financial sector and should be pursued by the Board. Indeed, the Board recognizes that a CBDC could "provide a safe foundation for private-sector innovations to meet current and future needs and demands for payment services." Existing payments entities in the private sector, including processors, banks, and fintech companies, could benefit from the foundation provided by a CBDC. Users could have the option to store and transfer their CBDC using existing payments intermediaries. Payments entities would have to compete for volume by offering cost-effective value-add services, thereby advancing innovation, driving down system costs, and increasing digital transaction output systemwide. The competition fostered by a CBDC has the potential to benefit all stakeholders, including existing financial players, consumers, and merchants. Moreover, a CBDC can complement other real-time payments rails that are new to the market or are in development, like FedNow, the public money transfer alternative set to launch in 2023. While FedNow will provide an instant, irrevocable, and less expensive payments rail, a CBDC can offer even greater built-in functionality. Among other things, FedNow balances can be held only by banks, so FedNow will likely require users to have a bank account. In contrast, a CBDC could be designed to be held through non-bank intermediaries without the user having a bank account, like cash, and based on more flexible technology. For example, a CBDC has the potential to support smart contracts and efficient automation of payments, including government benefit disbursements and redemption. Moreover, ongoing improvements to FedNow could make it a useful alternative to a CBDC for certain types of transactions if a central bank prefers to offload the costs of maintaining the CBDC ledger. A CBDC would be an important complement and supplement to FedNow and other real-time payments solutions. The high costs of card-based transactions have persisted despite decades of attempts to regulate payments markets and foster competition. A CBDC provides a unique opportunity to address the fundamental lack of competition and resulting durable market power held by a very few legacy players in the U.S. payments ecosystem.

### *3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

A well-designed CBDC could positively impact financial inclusion. Ensuring open participation in the CBDC ecosystem would promote financial inclusion and give financial access to the economically vulnerable, a stated priority of the Board. In 2020, 5% of U.S. households were unbanked and 13% were underbanked, meaning these households did not have a bank account or did not have adequate access to financial services. As traditional cash declines, ensuring open access to a central bank currency becomes even more imperative. Today, banks' minimum balance requirements, high fees, distrust for private banks, and privacy concerns consistently rank as the top reasons given for being unbanked. A CBDC could directly address the needs of the unbanked by providing users a means to safely store and

transfer money with a mobile phone or other device. Central banks that are piloting or have launched CBDCs recognize the value of CBDCs in financial inclusion. Offline CBDC functionality would promote financial inclusion, especially as the use of cash declines. To the extent that a CBDC offers an alternative to more costly payment methods that are lower quality and less functional, a CBDC could drive down the cost of traditional payments, reduce the barriers to financial inclusion, and introduce greater functionality throughout the payments system. Design elements should incorporate the reasons why certain households remain unbanked: a CBDC account should be easily accessible and simple to use, protect privacy (while remaining traceable and auditable), clear at par like cash or checks, and it should not have minimum balance requirements. Importantly, users should not be limited to holding their CBDC at banks. Entrusting only financial institutions as CBDC access points would have a negative impact on financial inclusion because many unbanked consumers do not trust banks or otherwise do not want to open a bank account. The MAG supports a CBDC designed to promote financial inclusion and provide ubiquitous access to the digital financial system.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

A CBDC would be the ideal approach to improving and complementing the U.S. payments ecosystem. A well-designed and implemented CBDC could quickly improve the U.S. payments system and meet the growing digital payments needs of consumers. This can be accomplished in a way that complements and enhances the existing financial sector. As a currency directly issued by the Federal Reserve, a CBDC would address the demand for an efficient digital currency. First, CBDCs are well-suited to the digital way that consumers store and transfer their money, enabling digital transactions to clear instantly and reliably. As discussed above, the current status quo leaves as the dominant option for paying for goods existing bank-based payment networks which are relatively slow (taking days for settlement), inefficient, and costly. Indeed, the growing adoption and use of stablecoins and other cryptocurrencies demonstrate the demand for more efficient ways to store and transfer digital value. Notwithstanding implementation of a CBDC, the MAG supports the Board's and other agencies' ongoing work to ensure that stablecoins are properly regulated so that their advantages to the U.S. payments ecosystem are realized and their risks minimized. The ability for a CBDC to effectuate secure and real-time payments could spur competition and innovation in the financial sector. As the discussion paper states, faster payment alternatives hold promise to reduce the costs of "lower-value payments," while noting that "the costs and fees for certain payment methods (e.g., card transactions) may remain comparatively high for some parties to the extent that instant payments do not serve as a close substitute for those methods." Deployment of a CBDC could address the Board's perceived limitation of faster payments, potentially reducing the costs of all transaction values. Without a CBDC that promotes competition and innovation in the retail payments sector, including, to the extent the CBDC is intermediated, allowing more types of commercial entities to serve as intermediaries, U.S. merchants will continue to pay some of the highest costs of acceptance in the world while continuing to shoulder some of the highest rates of fraud. As the use of traditional cash decreases, payment card networks and banks will likely continue to increase fees for digital purchases, where competition is most limited. But a CBDC that provides a viable alternative means of transferring legal tender would immediately enhance competition.

A CBDC that spurs competition and innovation in the payments industry should be considered complementary to the financial sector and should be pursued by the Board. Indeed, the Board recognizes that a CBDC could "provide a safe foundation for private-sector innovations to meet current and future needs and demands for payment services." Existing payments entities in the private sector, including processors, banks, and fintech companies, could benefit from the foundation provided by a CBDC. Users could have the option to store and transfer their CBDC using existing payments intermediaries. Payments entities would have to compete for volume by offering cost-effective value-add services, thereby advancing innovation, driving down system costs, and increasing digital transaction output systemwide. The competition fostered by a CBDC has the potential to benefit all stakeholders, including existing financial players, consumers, and merchants. Moreover, a CBDC can complement other real-time payments rails that are new to the market or are in development, like FedNow, the public money transfer alternative set to launch in 2023. While FedNow will provide an instant, irrevocable, and less expensive payments rail, a CBDC can offer even greater built-in functionality. Among other things, FedNow balances can be held only by banks, so FedNow

will likely require users to have a bank account. In contrast, a CBDC could be designed to be held through non-bank intermediaries without the user having a bank account, like cash, and based on more flexible technology. For example, a CBDC has the potential to support smart contracts and efficient automation of payments, including government benefit disbursements and redemption. Moreover, ongoing improvements to FedNow could make it a useful alternative to a CBDC for certain types of transactions if a central bank prefers to offload the costs of maintaining the CBDC ledger. A CBDC would be an important complement and supplement to FedNow and other real-time payments solutions. The high costs of card-based transactions have persisted despite decades of attempts to regulate payments markets and foster competition. A CBDC provides a unique opportunity to address the fundamental lack of competition and resulting durable market power held by a very few legacy players in the U.S. payments ecosystem.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

A CBDC would be the ideal approach to improving and complementing the U.S. payments ecosystem. A well-designed and implemented CBDC could quickly improve the U.S. payments system and meet the growing digital payments needs of consumers. This can be accomplished in a way that complements and enhances the existing financial sector. As a currency directly issued by the Federal Reserve, a CBDC would address the demand for an efficient digital currency. First, CBDCs are well-suited to the digital way that consumers store and transfer their money, enabling digital transactions to clear instantly and reliably. As discussed above, the current status quo leaves as the dominant option for paying for goods existing bank-based payment networks which are relatively slow (taking days for settlement), inefficient, and costly. Indeed, the growing adoption and use of stablecoins and other cryptocurrencies demonstrate the demand for more efficient ways to store and transfer digital value. Notwithstanding implementation of a CBDC, the MAG supports the Board's and other agencies' ongoing work to ensure that stablecoins are properly regulated so that their advantages to the U.S. payments ecosystem are realized and their risks minimized. The ability for a CBDC to effectuate secure and real-time payments could spur competition and innovation in the financial sector. As the discussion paper states, faster payment alternatives hold promise to reduce the costs of "lower-value payments," while noting that "the costs and fees for certain payment methods (e.g., card transactions) may remain comparatively high for some parties to the extent that instant payments do not serve as a close substitute for those methods." Deployment of a CBDC could address the Board's perceived limitation of faster payments, potentially reducing the costs of all transaction values. Without a CBDC that promotes competition and innovation in the retail payments sector, including, to the extent the CBDC is intermediated, allowing more types of commercial entities to serve as intermediaries, U.S. merchants will continue to pay some of the highest costs of acceptance in the world while continuing to shoulder some of the highest rates of fraud. As the use of traditional cash decreases, payment card networks and banks will likely continue to increase fees for digital purchases, where competition is most limited. But a CBDC that provides a viable alternative means of transferring legal tender would immediately enhance competition.

A CBDC that spurs competition and innovation in the payments industry should be considered complementary to the financial sector and should be pursued by the Board. Indeed, the Board recognizes that a CBDC could "provide a safe foundation for private-sector innovations to meet current and future needs and demands for payment services." Existing payments entities in the private sector, including processors, banks, and fintech companies, could benefit from the foundation provided by a CBDC. Users could have the option to store and transfer their CBDC using existing payments intermediaries. Payments entities would have to compete for volume by offering cost-effective value-add services, thereby advancing innovation, driving down system costs, and increasing digital transaction output systemwide. The competition fostered by a CBDC has the potential to benefit all stakeholders, including existing financial players, consumers, and merchants. Moreover, a CBDC can complement other real-time payments rails that are new to the market or are in development, like FedNow, the public money transfer alternative set to launch in 2023. While FedNow will provide an instant, irrevocable, and less expensive payments rail, a CBDC can offer even greater built-in functionality. Among other things, FedNow balances can be held only by banks, so FedNow will likely require users to have a bank account. In contrast, a CBDC could be designed to be held through non-bank intermediaries without the user having a bank account, like cash, and based on more flexible technology. For example, a CBDC has the potential to support smart contracts and efficient automation of payments, including government benefit disbursements and redemption. Moreover, ongoing improvements to FedNow could make it a useful alternative to a CBDC for certain types of transactions if a central bank prefers to offload the costs of maintaining the CBDC ledger. A CBDC would be an important complement and supplement to FedNow and other real-time payments solutions. The high costs of card-based transactions have persisted despite decades of attempts to regulate payments markets and foster competition. A CBDC provides a unique opportunity to address the fundamental lack of

competition and resulting durable market power held by a very few legacy players in the U.S. payments ecosystem.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

In an era of declining cash usage, ensuring open participation in the CBDC ecosystem also would promote financial inclusion and give financial access to the economically vulnerable, a stated priority of the Board. Ensuring open participation in the CBDC ecosystem would promote financial inclusion and give financial access to the economically vulnerable, a stated priority of the Board. In 2020, 5% of U.S. households were unbanked and 13% were underbanked, meaning these households did not have a bank account or did not have adequate access to financial services. As traditional cash declines, ensuring open access to a central bank currency becomes even more imperative. Today, banks' minimum balance requirements, high fees, distrust for private banks, and privacy concerns consistently rank as the top reasons given for being unbanked. A CBDC could directly address the needs of the unbanked by providing users a means to safely store and transfer money with a mobile phone or other device. Central banks that are piloting or have launched CBDCs recognize the value of CBDCs in financial inclusion. Offline CBDC functionality would promote financial inclusion, especially as the use of cash declines. To the extent that a CBDC offers an alternative to more costly payment methods that are lower quality and less functional, a CBDC could drive down the cost of traditional payments, reduce the barriers to financial inclusion, and introduce greater functionality throughout the payments system. Design elements should incorporate the reasons why certain households remain unbanked: a CBDC account should be easily accessible and simple to use, protect privacy (while remaining traceable and auditable), clear at par like cash or checks, and it should not have minimum balance requirements. Importantly, users should not be limited to holding their CBDC at banks. Entrusting only financial institutions as CBDC access points would have a negative impact on financial inclusion because many unbanked consumers do not trust banks or otherwise do not want to open a bank account. The MAG supports a CBDC designed to promote financial inclusion and provide ubiquitous access to the digital financial systems.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

A CBDC would be the ideal approach to improving and complementing the U.S. payments ecosystem, which would otherwise continue to be hampered by a lack of competition and high fees. A well-designed and implemented CBDC could quickly improve the U.S. payments system and meet the growing digital payments needs of consumers. This can be accomplished in a way that complements and enhances the existing financial sector. As a currency directly issued by the Federal Reserve, a CBDC would address the demand for an efficient digital currency. First, CBDCs are well-suited to the digital way that consumers store and transfer their money, enabling digital transactions to clear instantly and reliably. As discussed above, the current status quo leaves as the dominant option for paying for goods existing bank-based payment networks which are relatively slow (taking days for settlement), inefficient, and costly. Indeed, the growing adoption and use of stablecoins and other cryptocurrencies demonstrate the demand for more efficient ways to store and transfer digital value. Notwithstanding implementation of a CBDC, the MAG supports the Board's and other agencies' ongoing work to ensure that stablecoins are properly regulated so that their advantages to the U.S. payments ecosystem are realized and their risks minimized. The ability for a CBDC to effectuate secure and real-time payments could spur competition and innovation in the financial sector. As the discussion paper states, faster payment alternatives hold promise to reduce the costs of "lower-value payments," while noting that "the costs and fees for certain payment methods (e.g., card transactions) may remain comparatively high for some parties to the extent that instant payments do not serve as a close substitute for those methods." Deployment of a CBDC could address the Board's perceived limitation of faster payments, potentially reducing the costs of all transaction values. Without a CBDC that promotes competition and innovation in the retail payments sector, including, to the extent the CBDC is intermediated, allowing more types of commercial entities to serve as intermediaries, U.S. merchants will continue to pay some of the highest costs of acceptance in the world while continuing to shoulder some of the highest rates of fraud. As the use of traditional cash decreases, payment card networks and banks will likely continue to increase fees for digital purchases, where competition is most limited. But a CBDC that provides a viable alternative means of transferring legal tender would immediately enhance competition.

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could benefit from the foundation provided by a CBDC. Users could have the option to store and transfer their CBDC using existing payments intermediaries. Payments entities would have to compete for volume by offering cost-effective value-add services, thereby advancing innovation, driving down system costs, and increasing digital transaction output systemwide. The competition fostered by a CBDC has the potential to benefit all stakeholders, including existing financial players, consumers, and merchants. Moreover, a CBDC can complement other real-time payments rails that are new to the market or are in development, like FedNow, the public money transfer alternative set to launch in 2023. While FedNow will provide an instant, irrevocable, and less expensive payments rail, a CBDC can offer even greater built-in functionality. Among other things, FedNow balances can be held only by banks, so FedNow will likely require users to have a bank account. In contrast, a CBDC could be designed to be held through non-bank intermediaries without the user having a bank account, like cash, and based on more flexible technology. For example, a CBDC has the potential to support smart contracts and efficient automation of payments, including government benefit disbursements and redemption. Moreover, ongoing improvements to FedNow could make it a useful alternative to a CBDC for certain types of transactions if a central bank prefers to offload the costs of maintaining the CBDC ledger. A CBDC would be an important complement and supplement to FedNow and other real-time payments solutions. The high costs of card-based transactions have persisted despite decades of attempts to regulate payments markets and foster competition. A CBDC provides a unique opportunity to address the fundamental lack of competition and resulting durable market power held by a very few legacy players in the U.S. payments ecosystem.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

A critical consideration of a CBDC is balancing the public's interest to transact privately and anonymously with the necessity to minimize illicit activity. This balance is best achieved if CBDC transactions can be anonymous to private participants while still subject to the same laws and regulations that apply to the existing payments space (e.g., AML/KYC). That way, a CBDC would emulate cash with the ability to transact quickly and privately, while providing law enforcement the ability to deter, investigate and track criminal activity. A well-designed CBDC also could lower U.S. payment fraud. Leveraging the immutable ledger technology employed by cryptocurrencies, CBDCs can be resilient to payment fraud, especially if existing authentication and security features are embedded into the transfer process from the outset. Nonetheless, the Board should address and provide clear guidance as to the allocation of the risks of fraud. As a starting point, a CBDC should operate like cash, where a transfer is final upon delivery, and absent fraud, the risk of loss rests with whoever has custody of the money at the time of loss. Of course, the Board should implement additional CBDC features that could facilitate recovery of CBDC in the event a user loses or cannot access their CBDC.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

The MAG's understanding of the implications of defining CBDC as "legal tender" is that CBDC would have to be accepted for the payment of all debts, public charges, taxes, and dues, pursuant to 31 U.S.C. 5103. To that extent, a CBDC should be legal tender. For clarity, the MAG does not support a requirement that would force merchants to accept CBDC as payment for goods and services.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

The Board should not impose a minimum balance requirement on a user's account or wallet. A minimum requirement is unnecessary and would be contrary to the Board's stated goal to prioritize financial inclusion. And while the MAG does not have a position on whether the

Board should limit the total amount of CBDC an end user or single account could hold, any limits should take into account that certain types of users may have needs for high limits. Large merchants, for example, would have to be able to accept substantial amounts of CBDC, especially if the CBDC becomes widely used by consumers. A limitation that would have the effect of requiring holders such as merchants to immediately convert CBDC would reduce the utility of the CBDC or effectively prevent a merchant from accepting CBDC at the point of sale (so as to avoid the possibility that a consumer's payment will fail simply because the merchant temporarily hit its balance limit). Likewise, businesses that hold large cash reserves should be permitted to hold CBDCs in the same manner. One option to address the needs of different users is to provide different limits for different classes of users. The Bahamas, for example, offers individual and merchant CBDC accounts, each with different holding and transaction limits. The Board could follow a similar approach to balance its concerns about capping CBDC holdings with merchants' needs to conduct their business effectively.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Although the Board's discussion paper suggests that a U.S. CBDC should likely be intermediated—meaning that consumers cannot interact directly with the Federal Reserve to open CBDC accounts or transfer their CBDC—the MAG does not believe this should be a foregone conclusion. There are several advantages to issuing CBDCs directly to users. Such a CBDC would most closely resemble the treatment of cash while also adding the superior transferability of digital money. A direct CBDC also would be the least complex to implement and the easiest for the Board to regulate because it would involve fewer private intermediaries, which increase system costs. At the same time, it could create a foundation for private-sector competition and innovation. A direct CBDC or intermediated CBDC with separate accounts for each user would enable the government to easily distribute payments right to consumers. For example, the government could seamlessly transfer stimulus payments directly into users' CBDC wallets rather than mailing paper checks or payment cards issued by financial intermediaries. During the COVID-19 pandemic, the Treasury Department provided nearly \$25 billion in stimulus payments via Visa prepaid debit cards issued by Metabank, an issuing bank exempt from regulated debit fee caps. Without a better way to transfer stimulus funds, merchants paid hundreds of millions in fees to Metabank, as these prepaid debit cards cleared at credit-like unregulated rates. A direct-to-consumer CBDC—one that also could be programmed for certain uses—could correct this problem. If the Board determines that a U.S. CBDC should be intermediated such that only private sector entities may offer digital wallets to facilitate CBDC holdings and payments, the MAG believes that it is critical that the system be designed to ensure maximum participation. As the Board notes, potential players in an intermediated CBDC system would have to operate in an "open market for CBDC services." The current digital payments system is dominated by a few players—i.e., banks—which have a legal monopoly over access to Federal Reserve master accounts through which existing USD payment systems operate, as well as a monopoly over issuing bank status in card schemes. The current payments system is thus marked by high fees and comparatively low quality and has led to unnecessary costs imposed on the storage and transfer of money. A CBDC implementation should not replicate the same paradigm. To avoid this outcome, nonbanks should be permitted to serve as CBDC intermediaries (subject to obtaining necessary licenses and satisfying proportionate, risk-based requirements). Accordingly, a CBDC should create the ability for value to be stored and transferred between parties in a seamless manner. Importantly, a CBDC design should not unnecessarily restrict how users can store or transfer their CBDC. Likewise, the Board should not unnecessarily restrict which intermediaries can participate in effectuating CBDC payments, and the Board should take care not to limit participation to traditional banks. The MAG believes the goals of a CBDC can best be achieved if there exists a healthy, competitive marketplace with many participants innovating and competing to offer CBDC users the best functionality for the lowest price.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

To maximize CBDC's value as a ubiquitous payment method, a CBDC should ideally have both online and offline functionality. When users are online (i.e., connected to the internet), the transfer of CBDC is communicated to the network and can be memorialized virtually instantly, resulting in seamless and automated processing and clearing. Because these online transactions are cleared instantly, they are final and irrevocable. Limiting the potential use of a CBDC to online environments, however, would reduce its utility and ubiquity. Indeed, businesses of all sizes commonly experience periodic network outages, and history has shown through natural disasters that there will be moments when online connectivity is not available but access to currency is imperative. The Board should therefore ensure that a CBDC remains functional when users are offline. Implementing offline CBDC functionality

may introduce complexity and fraud concerns. Because the network is unaware of the offline transaction, it cannot verify that the user has sufficient CBDC for a transaction, nor can it prevent a user from double-spending CBDC. While this risk does not exist with cash, which by its nature operates offline, such an event would reduce consumer confidence in the CBDC. Although these added risks make offline CBDC implementation more complex than online implementation, there are existing security protocols designed to solve for the risks of offline CBDC. EMV technology is adopted throughout the world (except in the U.S.) to provide offline as well as online authentication; a common offline implementation is transit, where transactions are stored and forwarded by batch later. Some central banks are in various stages of implementing CBDC that can operate in both online and offline environments. Because a secure offline CBDC solution is considerably more challenging to achieve, the Board could implement a two-phased approach and launch an online CBDC while continuing to develop and pilot offline functionality. The MAG's ultimate goal is for a reliable and safe CBDC that can be used in both online and offline environments.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

A CBDC should facilitate seamless payments by maximizing ease of use at any point of interaction or transfer. One of the potential advantages of a CBDC is the ability for it to be easily used by consumers. If implemented with simple technology, a well-designed CBDC could enable users to transfer CBDC without more than a low-end mobile phone. Accordingly, it is crucial that merchants not be required to implement major infrastructure changes to accept CBDC. To ensure that CBDCs have maximum applicability to different users and use cases, CBDC architecture should be flexible to easily allow technological upgrades or value-added services to be layered on top. Additionally, the Board should ensure that the CBDC is easily interoperable with current (and future) payment methods. For example, a consumer (at their discretion) should be able to effectuate the transfer of CBDC to a merchant using a variety of payment methods, including payment cards, digital wallets, or simply direct transfers between CBDC wallets. Likewise, users should be permitted maximum flexibility to store their CBDCs. Currently, cash deposits can be transferred using a variety of payment rails, and CBDC should allow for users to replicate that environment. In fact, the ability to use CBDC ubiquitously across payment forms would foster innovation in the payments system because private actors would compete for CBDC transaction volume and deposits.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

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*21. How might future technological innovations affect design and policy choices related to CBDC?*

A CBDC should facilitate seamless payments by maximizing ease of use at any point of interaction or transfer. One of the potential advantages of a CBDC is the ability for it to be easily used by consumers. If implemented with simple technology, a well-designed CBDC could enable users to transfer CBDC without more than a low-end mobile phone. Accordingly, it is crucial that merchants not be required to implement major infrastructure changes to accept CBDC. To ensure that CBDCs have maximum applicability to different users and use cases, CBDC architecture should be flexible to easily allow technological upgrades or value-added services to be layered on top. Additionally, the Board should ensure that the CBDC is easily interoperable with current (and future) payment methods. For example, a consumer (at their discretion) should be able to effectuate the transfer of CBDC to a merchant using a variety of payment methods, including payment cards, digital wallets, or simply direct

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*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

The implementation of a CBDC has the potential to substantially alter the U.S. payments landscape. Done well, it marks a generational opportunity to modernize the payments system, empower consumers, promote competition, and foster innovation. However, if a CBDC does not include carefully considered policy and design elements, inefficiencies in the current payments system—marked as it is by dominant players with durable market power—will be extended into the future, and a valuable, once-in-a-generation opportunity will have been lost. To ensure the best design, it is imperative that the Board solicit and reflect the demands of consumers and incorporate the voices of key stakeholders when implementing a CBDC. Merchants, who are particularly impacted by changes to the payments landscape, should be involved early and often throughout the process. Merchants will need to understand and provide feedback on proposed fraud and security measures, and they will need detailed specifications for reconciliation with their existing payments processes. A lack of merchant buy-in and readiness could jeopardize the CBDC's viability and widespread adoption. Accordingly, the MAG strongly encourages the Board to continue holding forums and establish workgroups that include merchants to weigh in on the design and implementation of a CBDC, and to help merchants understand what to expect throughout all stages of development. Incorporating the feedback of key stakeholders like merchants will increase public support and adoption and will better ensure that a U.S. CBDC ecosystem works efficiently, competitively, and fairly. The MAG appreciates the opportunity to provide its comments to the Board regarding the creation of a potential U.S. CBDC. Ultimately, a well-designed CBDC has the potential to modernize the U.S. payments system to meet consumers' need to transact digitally, while also injecting needed competition to spur innovation, greater functionality, and reduced costs that will benefit consumers and the economy as a whole.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The structure of a new CBDC needs to be reconsidered from the outline in the RFC. First, treasury coined, dollar-based bank-issued digital currency (if technologically possible) or Fed-backed stablecoins would allow for a new type of account that is held on a bank's balance sheet. Second, this could allow for deposits to be FDIC insured as opposed to a Fed liability that creates a risk-free advantaged deposit account outside the private sector; thus, the ability for the private sector to continue to use the new digital deposits to lend back to the market and make investments.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

The above referenced structure could give non-bank providers a place in the services market much as they have today. They must still go through a regulated FI and follow MSB-type procedures. These entities could potentially have lower KYC requirements within AML limits for those that find it difficult to open an account at an FI, allowing for inclusion to those outside of the current financial services marketplace.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

As presented, there is concern that this could be negative for inclusion as it further separates the unbanked from a relationship with an FI for loans, investments and other products that help them to build a successful financial condition.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

While we support the Fed's stated goals, we do not believe a Fed-issued liability will positively accomplish the ends. With a Fed liability taking funds out of the private sector, new and unproven monetary policy methods would need to be developed. These new tools might include expiration dates for digital currency or even impose a negative rate applied during market stress. With a bank-issued digital currency, the Fed's current toolset would be the same.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

As referenced in the RFC, there is concern that a CBDC could destabilize the market in several ways. One of the worries is the potential disruption of deposits flowing from the private sector to the Fed's balance sheet. Many smaller FI's and their communities would be negatively affected by the resulting loss of funds to lend and invest. The potential outflow could be significant across the financial sector upsetting markets. Potential remedies to replace those deposits of well-regulated and well-capitalized institutions would necessarily raise cost of funds.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Please see #5. With the loss of deposits to lend, the public may be forced to go to riskier lending alternatives. This is neither inclusive or positive.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

No comment

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes, as there will always be consumers that trust cash preeminently. The downside is that there are currently more places that won't accept cash and this has been exacerbated by the effects of our collective Covid experience.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Today, non-bank issued digital currencies are speculative and mainly used for investment purposes, and understandably do not have the confidence of the general public. The concept of the US dollar as the world's reserve would be diminished if there are safer, secure and pseudo-anonymous options. So, yes, we need to be competitive.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

As stated above, this is a serious consideration. The main reasons that the world holds US dollars have to do with the breadth and stability of our markets, confidence and faith in our government, and the rule of law in the US over other alternatives. Cash is still available until a US dollar based, Fed-backed digital currency is rolled out. While other countries are trying to solve the same issues we have some time, but we need to make sure our plan is properly vetted and not rush too quickly.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

No comment.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Once again, a bank-issued, Fed-backed stablecoin could satisfy consumer privacy concerns within the FI's KYC and AML policies and procedures. Many consumers would be skeptical using a CBDC for anonymity with "the government" that has oversight over daily transactions.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

No comment.

*14. Should a CBDC be legal tender?*

Yes, if it is a CBDC as defined in the RFC. Otherwise, it doesn't matter.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

This could be decided by the fair market with competition for deposits. If this were a Fed liability, the answer should be no, as it would already be an advantaged risk-free deposit product to the rest of the market. Additionally, to minimize the opportunity for arbitrage the CBDC should be on par to the US Dollar.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

This should probably be answered within regulatory guidelines just as cash is limited and monitored. FI's KYC and internal systems would be able to oversee activity, flag suspected activity and continue to file SAR's. If the CBDC existed as proposed in the RFC, then there would need to be limits to how much an individual could possess, so as to limit the runoff from

the private sector. Additionally, this would leave all responsibility to the Fed for monitoring the balances and transactions of individual users. How would the Fed manage these individual accounts for overages? Would the Fed limit this to a single FI or non-bank wallet as opposed to a consumer that might have multiple relationships and wants to maximize each one?

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Any chartered, regulated FI should be the initial entrance point to the digital currency. The non-bank providers will then fall under normal KYC, AML and other oversight necessary to ensure safety and soundness.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

This would be best, and there are technologies available that could help make this work with proper oversight.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes. This will also encourage the use of the digital currency. Just another reason to make sure it is bank-issued and regulated. These POS dollars need to be monitored as merchant activity is today. FI's and their non-bank providers are in the best position to effectively do this.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

A wholesale CBDC would be most effective for this type of deployment and should only be used by the central bank or other chartered FI's.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

No comment.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

No comment.

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*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

A well-designed CBDC could provide a positive effect to inclusion and the economy by expanding access to and usage of affordable financial services. A CBDC could also contribute to green inclusive sustainable growth. Expand modes of payments beyond financial institutions. Today in the United States, 6.9% of individuals are unbanked and account ownership is slightly lower than in other high income countries. The top two reasons cited for this are that adults do not have sufficient funds to maintain account balances at banks and their mistrust of banks. The development of a CBDC could support financial inclusion through the design of low-cost solutions for consumers and MSMEs, specifically merchants accepting payments. A CBDC issued on the appropriate infrastructure could lead to the development of a real-time payments system, allowing for transactions to settle and finalize in seconds.

Reduce merchant acceptance costs of digital payments. One of the main friction points for the adoption of digital payments by merchants is acceptance costs and fees. Costs remain high for merchants accepting retail payments due to the need for multiple intermediaries to complete a transaction. In recent years, innovation brought more affordable tools for retailers such as QR payments and mobile money. However, fees to accept a digital payment made by a consumer through a debit and/or credit card are still high for merchants. A CBDC built using blockchain would reduce merchants' acceptance costs due to the efficiency to move value and the removal of intermediaries required to process a transaction. Transition individuals and MSMEs from the informal to the formal economy. According to data from the World Bank, the informal economy in the United States amounts to 8.1 percent of the GDP. A CBDC could be the entry point to individuals and MSMEs to the formal financial system and economy. A CBDC could help those operating in the informal economy to start building a credit history based on their payments behavior. This would allow them to access new financial products, from lending and savings to investments and insurance. Develop an innovative and competitive local ecosystem. The United States has one of the most innovative financial markets in the world. Having a CBDC could be an opportunity for the financial sector to enhance further innovative services for the unbanked and underbanked. In a two-tier distribution model, the Federal Reserve would issue a CBDC and remain in control of monetary policy and financial entities would distribute a CBDC to consumers and MSMEs, minimizing the risk of banking disintermediation that affects the cost of credit and financial stability. If the CBDC were issued on an open blockchain, such as on the Stellar network, the Federal Reserve would also ensure that trusted financial entities selected by the Federal Reserve can validate and process payments, which enables competition. This architecture would in turn incentivize the development of innovative solutions by financial entities in a competitive and secure environment as consumer needs evolve. A clear example of this could be offline products, specifically in rural regions or for vulnerable groups with a low rate of digital and financial literacy. Reduce the cost of cross-border payments. The global average cost of cross-border payments remains high at 6.04 percent of the amount sent. This is more than double the United Nations' Sustainable Development Goal target of 3 percent.

The high costs of remittances have real-world impacts on individuals and businesses. High costs affect, for example, migrants seeking to send money home to their families, MSMEs importing products from foreign suppliers. A CBDC built on an open network would enable cross-border payments including remittances and business-to-business payments that finalize in seconds and cost fractions of a cent, mainly due to the reduction of intermediation. For example, the total cost for senders in the United States to receivers in Colombia amounts to 1.6% on the Stellar network. This is far less than the average cost of sending funds using the centralized payments system, which amounts to 5.3% according to data from the World Bank Group. Foster interoperability A CBDC built on an open system could provide instant real-time payments in central bank money, so payees could receive funds instantly. The core ledger could be built with relatively simple functionality, so that it would be as efficient and cost-effective as possible. An effective design model should prioritize interoperability, permitting that any CBDC account would be able to pay any other CBDC account, whether this is a commercial bank, a digital wallet provider, or other financial entity. These solutions and products can be built on an open system to enable a CBDC to meet payment needs as they evolve. A CBDC should also be interoperable with cash and electronic money at a domestic and retail level.

4. *How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*
5. *How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*
6. *Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*
7. *What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*
8. *If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*
9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*
10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*
11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*
12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*
13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*
14. *Should a CBDC be legal tender?*
15. *Should a CBDC pay interest? If so, why and how? If not, why not?*
16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*
17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?

19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?

20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?

21. How might future technological innovations affect design and policy choices related to CBDC?

22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?

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*Name or Organization*

PayPal

*Industry*

Payment System Operator or Service Provider

*Country*

United States of America

*State*

California

*Email*

amykim@paypal.com

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

[Please see our more fulsome letter sent separately, which also contains citations.] Across the globe, governments are actively studying the merits of CBDCs, with 87 countries (representing over 90 percent of global GDP) noting active exploration. We believe the United States should take a leadership role in this space. The U.S. Dollar plays a critical role not just domestically, but across the globe. As the primary global reserve currency, the dollar is used to conduct international transactions based on the availability and prevalence of financial instruments denominated in dollars as well as the depth and integrity of U.S. financial markets. The relative stability of the dollar against other currencies instills trust and confidence that dollars will serve as an effective medium of exchange and store of value. The importance of dollars in international transactions makes the Federal Reserve one of the leading central banks that can provide international liquidity. The importance of the U.S. dollar and its ubiquity in international payments is based on many factors, including the country's underlying economic infrastructure, governmental and financial stability, rule of law, and global trust. While several countries aim for their currencies to play a greater role internationally to reduce dependence on the dollar, the persistent strength of the dollar indicates the formidable advantages it enjoys. If the U.S. dollar is to remain the world's primary reserve currency in the unfolding century, then being at the forefront of technological innovation that reduces friction in payments should be an area of focus. Accordingly, the U.S. government and the Board should actively explore and consider new digital forms of money that can most effectively operate in an increasingly digital world. PayPal believes that a digital dollar could be a logical next iteration to futureproof the U.S. dollar. A properly designed digital dollar could promote diversification of the payment system and spur financial innovation, inclusion, and global currency interoperability. To maximize the benefits of a CBDC, the private sector should play a key role in developing new technologies, partnering with the Fed on implementation and distribution, and expanding digital dollar access to the un- and underbanked to drive financial health. Underpinning our response is a belief in certain core tenets of a digital dollar. To that end, PayPal agrees with the Board that "a potential U.S. CBDC, if one were created, would best serve the needs of the United States by being privacy-protected, intermediated, widely transferable, and identity-verified." Building on these principles, we believe a future digital dollar should:

- Operate alongside existing and future payment options and innovations, including but not limited to ACH, wire, credit, and private digital currency payment solutions;
- Be offered to retail and wholesale users;
- Be facilitated and distributed through accounts and digital wallets at regulated banks and financial services companies, such as trust companies and money transmitters;
- Ensure individual privacy, while satisfying law enforcement requirements;
- Promote global digital currency and network interoperability;
- Be flexible in its design, so as to account for future technology, policy, or economic changes; and
- Encourage private sector innovation and collaboration.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

[Please see our more fulsome letter sent separately, which also contains citations.] We believe that financial inclusion and access are key prerequisites to achieving and maintaining the broader goal of "Financial Health." Financial Health is a framework for assessing how well a person's daily financial systems help people cope, build resilience, and create opportunities to pursue one's goals. Whether rural or urban, in countries both developed and developing, people share a common aspiration for financial health. Being financially healthy is both a

feeling and a metric. It's the sense of security gained by knowing you have enough money to pay the bills and have a cushion for a rainy day or unexpected event. It's the ability to develop and stick to a plan and achieve a goal. Helping people to accomplish and/or maintain strong financial health is at the heart of PayPal's mission to democratize the movement and management of money. We firmly believe that how we pay for goods and services is fundamental to financial health, meaning that consumers must have choice in payment methods, understanding of payment options, visibility into their financial standing, financial options to achieve their goals, and the ability to exercise those needs in the coming digital age. Central bank digital currencies are an integral part of that overall framework. As a financial technology platform bringing together consumers and merchants for over 20 years, we have played an instrumental role in fostering the growth of digital finance. PayPal helped enable the digital evolution of payments with the onset of online commerce. We believe that digital assets will help to enable the next generation of payments. In furtherance of that vision, we now enable our customers to buy, sell, hold, and check out with 4 select cryptocurrencies. The advent of stablecoins presents another option that could be widely used, as it is pegged to fiat currency and could enable faster cheaper financial transactions in the digital and coming web3 environment. And, we would want to develop the ability to hold and transfer CBDC through PayPal as well. Depending on how a CBDC is designed, it could potentially fulfill currently unmet and future payments needs. For example: - Further digitization of the small business sector, which makes up 99% of all businesses in the US, can be facilitated by a retail CBDC. - Sending international remittances to loved ones overseas may incur lower fees and take fewer days in a more efficient infrastructure. - The disbursement of government-to-person (G2P) payments could take place quickly at scale, which can provide critical relief in times of disaster and crisis. These are tremendous opportunities, and they would be dependent on the design choices of CBDCs, which are complex and need to be carefully researched.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

[Please see our more fulsome letter sent separately, which also contains citations.] The Board's paper identifies the potential for greater financial inclusion and access as among a CBDC's greatest potential benefits. We agree. It is well documented that nearly 7.1 million households in America remain unbanked, with the majority of such households being Black and Hispanic. Despite some evidence of progress, roughly 13.8% of Black households and 12.2% of Hispanic households were unbanked according to a 2019 FDIC survey. Notably, a separate 2021 survey found that one of the primary reasons individuals remain unbanked is due to distrust of banks given experience with surprise punitive fees, such as overdraft. That is why facilitating access through different regulated financial intermediaries is important to the distribution of a U.S.CBDC. The underbanked represent an additional subsegment of the U.S.population that is currently underserved by the financial system. Approximately 20% of U.S.households are considered underbanked, meaning that they used alternative financial products outside the banking system. 30% of Americans worry daily about the amount of debt they carry and 32% have difficulty paying for basic household expenses including food. A further 67% of Americans are not financially healthy, meaning they have little financial cushion if economic conditions worsen. 69% of Americans are living paycheck-to-paycheck, meaning they would experience financial difficulty if paychecks were delayed for a week. And, 77% of Americans report feeling anxious about their financial situation. Concurrently, there is growing global evidence of gradual decreases in the use of physical cash. Though likely impacted by the COVID-19 pandemic, a recent survey found that cash only accounted for 19% of transactions by individuals in 2020, marking a decline of seven percentage points from 2019. An early 2021 survey conducted by PayPal found that 26% of consumers in the United States hoped to use less cash during the year and 58% liked the idea of not having to carry cash or coins. Additionally, 73% of those surveyed in the United States stated they would be likely to use a secure U.S. CBDC that is usable online and everywhere cash is accepted. That percentage was even higher with younger demographics, including millennials. Against this backdrop, the potential appeal and inclusionary benefits of a digital dollar begin to crystallize. If a U.S. CBDC were made available through a digital wallet service offered by regulated financial services firms, it is likely that a meaningful percentage of currently un- and underbanked individuals would find benefits from a digital dollar.. There are numerous and complex causes that contribute to unbanked and underbanked populations. We need to study these and address them individually – there will be no one solution to this global problem. It is a problem that deserves thought and action, which may need to come in small doses to test solutions for effectiveness, or recalibrate to achieve the desired results. While a U.S. CBDC may not succeed in converting all unbanked and underbanked persons into those that fully utilize the needed financial services, even impacting a small percentage of the 20% of U.S.households that are underbanked is worthwhile and should be fully considered. Non-bank financial services providers like PayPal and Venmo typically offer free onboarding and carry no minimum balance. Additionally,

PayPal's two-sided platform connects both consumers and merchants in a seamless manner. Our services provide a favorable experience for the consumer and entree into a digital marketplace that does not typically accept cash or checks. Digital wallets could be tailored to offer access to digital dollars, custody, and related payments services. These offerings would be in parallel with other payments services, providing competition and consumer choice. Once onboarded through a digital wallet service, a previously unbanked or underbanked individual would find herself connected to the global financial system and e-commerce platforms.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

[No comment]

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

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[No comment]

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

[Please see our more fulsome letter sent separately, which also contains citations.] PayPal has long been at the forefront of financial services and technological innovation. By leveraging the Internet and mobile technologies, PayPal has focused on expanding access to financial services, reducing consumer friction and cost, as well as increasing transaction speed. We view this next generation of digital asset technology as part of this evolution and one, if properly harnessed, that can unlock benefits for consumers and small businesses alike. By facilitating greater automation, digital asset technology holds the promise to drive key benefits across the payments system including increased speed and efficiency; greater security; innovative new functionality; interoperability; and, programmability. As the Board and Reserve Banks consider design choices and related technology solutions for a digital dollar, it is important to ensure satisfaction of these elements. We unpack each element below. One of the central benefits of digitized modern payments rails that leverage some of the innovations in blockchain and cryptography is the ability to automate the settlement of payments and maintenance of the ledger. It is this automation that can eliminate costly, time-consuming, and sometimes manual processes associated with legacy infrastructure. This advantage can reduce transaction times and costs. It can further simplify the payments system by removing siloed databases and providing access to consumers and businesses to previously closed networks. These features can result in a dramatically more efficient and speedy financial system. This in turn could result in reduced costs compared to the current system. The use of a digital dollar that transacts on more efficient rails should include regulated digital wallet providers who can process payments on the designated rails (and help manage or ensure proper governance of the rails) and the central bank operator of the CBDC system. Settlement times that today take days can be reduced to minutes, and errors that can be introduced due to the many intermediaries and systems through which a payment typically flows can be significantly reduced. As a result, financial system participants will not only have greater transparency into the movement of funds but will also enjoy greater liquidity and improved cash flow, further stimulating the economy. A properly designed CBDC can also serve as a foundation for a safer and more secure payments network. Because digital currencies can employ multi-layer security in addition to strong authentication and authorization assurances, they can be subject to secure processes like multiparty authentication or enhanced transaction verification. Additional features embedded in a digital currency can facilitate compliance with reporting requirements, support AML and anti-terrorist financing efforts, and assist law enforcement in the prosecution of financial crimes. Notably, emerging encryption technologies can provide these benefits while preserving consumer privacy and control in how their data is used and shared. Another feature of CBDC technologies is the ability to spur additional innovations across the financial sector. At PayPal, we have seen firsthand the impact that digitization has had on the economy and

society. The ability to perform many different kinds of financial transactions directly on a mobile device has improved accessibility, particularly in rural locations and banking deserts. Giving small businesses the ability to accept payments digitally has enabled them to compete on a national or global scale. With more aspects of our lives taking place online, it's easy to see that a secure and open digital dollar could power use cases that we couldn't even conceive of today.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

[Please see our more fulsome letter sent separately, which also contains citations.] A digital dollar could render cross-border remittance transactions more efficient and cost effective. Many individuals face high fees sending money across borders due, in part, to numerous intermediaries; an interoperable digital dollar that could be readily exchanged across borders and converted into another digital fiat currency holds promise in connecting funds more directly, quickly, and efficiently to those who need them. PayPal has long worked to expand financial inclusion and health in the digital realm. We frequently work in partnership with banks and traditional financial institutions as a regulated financial services provider. We believe that a U.S.CBDC holds particular promise in advancing inclusion and financial health if it recognizes the benefits of open systems and broad distribution of digital dollars by regulated entities beyond traditional banks. More specifically, as our response notes, the traditional banking system has faced challenges in reaching all segments of the population, especially historically disadvantaged, minority, and low-income groups. Recent research underscores this dynamic by noting that non-bank fintech providers were far more effective in reaching minority-owned businesses during the COVID-19 pandemic to offer them Paycheck Protection Program (PPP) relief. For example, PayPal's PPP loan program is over-indexed in the majority of the top 30 counties that have the highest density of Black business activity and heightened incidence of Covid-19. More specifically, the coverage rate for PayPal-facilitated PPP loans is above average in 23 out of these 30 counties, in sharp contrast to the overall PPP, in which the coverage rate is below average in 22 out of these 30 counties. Indeed, there is clear evidence that non-bank financial technology providers are increasingly providing key services for underserved women and minority consumers. For example, PayPal Working Capital (PPWC) loans are distributed to areas with greater concentrations of minority populations, helping to close the gap in access for minority entrepreneurs. The percentage of total PPWC loans going to census tracts with greater than 25% African American population share is slightly higher than traditional SMB loans (13% vs. 11%). Also, this same group of borrowers are growing more quickly than the average SMB (22% vs. 9%). Given the ability of non-bank fintechs to reach broader populations, it is critical that a U.S.CBDC be offered and distributed through both regulated banks and non-banks, including state-regulated money transmitters and trust-companies. As highlighted elsewhere in our response, distribution would likely occur through digital wallet services, which would offer tailored custodial and payments services. Such offerings are ideal products for fintechs, which specialize in nimble, consumer-friendly applications, as well as connectivity with other service providers. A U.S.CBDC offers a unique opportunity to leverage a broader set of regulated entities to help expand access to digital financial services.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

[Please see our more fulsome letter sent separately, which also contains citations.] A key feature of CBDC-related technology is the potential for enhanced interoperability. Domestically, this means operating alongside, and easily convertible to, other forms of digital currency, such as privately issued digital currencies like bitcoin and stablecoins, as well as digital representations of fiat currency. The system should facilitate consumer and business optionality and choice. The breaking down of silos provides an opportunity to connect digital economic systems, including other global CBDCs and financial networks. Interoperability, however, is predicated on careful coordination between the central bank issuers of CBDCs and related stakeholders, along with the development of standards. For this reason, we urge the Board to assume a global leadership role in developing interoperability standards for CBDCs, including with respect to privacy and security.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

[Please see our more fulsome letter sent separately, which also contains citations.] The impact of a CBDC on G2P payments could be immense. Far too many Americans waited months to receive stimulus checks at the onset of the COVID-19 pandemic. A combination of a CBDC and digital identity could enable these individuals to receive their money through direct deposit in a far more timely manner. G2P payments provide a lifeline to millions of

Americans and can be made far more efficient through a CBDC. The pandemic underscored the importance of access to accurate, timely, safe, efficient, and affordable payments for all Americans and the high cost associated with being unbanked and underbanked. While the large percentage of pandemic relief payments moved via direct deposits to bank accounts, it took weeks to distribute relief payments in the form of prepaid debit cards and checks to households that did not have up-to-date bank account information with the Internal Revenue Service. Approximately 35 million individuals had to wait for months to receive their stimulus checks, if they received them at all. PayPal was honored to participate in the disbursement of stimulus checks. In the first round alone, 100,000 Direct Deposits were made via PayPal and Venmo. In the second round, 117,000 direct deposits were made via PayPal and Venmo. Instead of waiting for physical checks to be printed and mailed and later cashed and deposited, individuals and households could submit their PayPal account details directly to the IRS website and elect to receive their stimulus payment through Direct Deposit into a PayPal CashPlus account. The challenges of getting relief payments to these households highlighted the benefits of delivering payments more quickly, cheaply, and seamlessly through new digital infrastructure, and CBDCs can be a means of increasing financial inclusion and improving financial health. Given the likely speed, efficiency, and cost benefits of a digital dollar, low-income individuals should be able to shift certain financial activity away from high-cost legacy providers, including check-cashers and payday lenders, that often come with significantly higher fees. Additionally, a digital dollar could support small business merchants by providing them (and customers) with a new form of payment, especially given reduced physical cash dealings and the trend toward reduced cash usage. Indeed, as economies move away from physical money, it is prudent to offer the public access to a modern, digital form of cash. A digital dollar can offer important competition against other forms of payment and allow participants access to central bank money through regulated intermediaries. Finally, a digital dollar would be responsive to clearly shifting preferences among consumers. Younger generations are increasingly reliant on mobile access to digital services, and a digital dollar meets them where they are. Offering public money in a digital format would appear to be the next step in the natural evolution of the dollar.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

[Please see our more fulsome letter sent separately, which also contains citations.] One of the most important elements of a U.S. CBDC is ensuring user privacy while satisfying legitimate law enforcement requirements. Many have expressed concern that CBDCs could allow for government surveillance of citizen payment transactions, especially to the extent that the digital currency transacts upon highly centralized government rails. On the other hand, some worry that treating a CBDC as a pure analog to cash along with its anonymity features will facilitate illicit activity and threaten national security. Given these important considerations, it is imperative that the United States gets privacy right when it comes to a digital dollar. With thoughtful design and implementation, the digital dollar could enjoy competitive advantages relative to other national CBDCs that permit unchecked surveillance. One advantage the United States already enjoys is existing legal due process and protections when it comes to individual financial information. These protections, which include those under the 4th Amendment of the U.S. Constitution, should be embedded within the design of a digital dollar and associated authorizing legislation. Notwithstanding the importance of privacy, it is also important that a CBDC system be capable of meeting key law enforcement requirements and objectives. A CBDC design that relies on regulated entities to serve as digital wallet service providers can ensure implementation of key KYC/AML requirements. Additionally, we encourage the Board to actively explore leading-edge privacy technologies that can help satisfy privacy and law enforcement objectives simultaneously. For example, zero-knowledge proofs are an area of development that allows network participants to validate certain information without having direct access to underlying, sensitive information. In the context of KYC/AML, this might mean verifying that an individual is not on a sanctions list without revealing the identity of the individual to the entity seeking verification.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

[Please see our more fulsome letter sent separately, which also contains citations.] A key feature of CBDC-related technology is the potential for enhanced interoperability. Domestically, this means operating alongside, and easily convertible to, other forms of digital currency, such as privately issued digital currencies like bitcoin and stablecoins, as well as digital representations of fiat currency. The system should facilitate consumer and business optionality and choice. The breaking down of silos provides an opportunity to connect digital economic systems, including other global CBDCs and financial networks. Interoperability, however, is predicated on careful coordination between the central bank issuers of CBDCs and related stakeholders, along with the development of standards. For this reason, we urge

the Board to assume a global leadership role in developing interoperability standards for CBDCs, including with respect to privacy and security. Another technological benefit of a CBDC is its programmable nature. This refers to “smart contracts” which enable tokens or currencies to be “programmed” to perform specific functions, like paying a mortgage on a certain date. Programmable money could help to reduce money laundering and terrorist financing by embedding eKYC and sanctions screening functionality. Tied to the concept of automation, digitized money can be wrapped in smart contracts and coded to include certain features and behave in determinable ways. The programmable nature of digital money means that regulation and compliance requirements can be embedded in money itself, and that business logic can drive desired outcomes. For example, a digital dollar could be programmed for humanitarian distribution in a disaster zone and only usable for the purchase of essential food and medical supplies in the first instance. In the context of financial markets, digital dollars could be programmed to facilitate clearing and settlement of transactions at efficient intervals. Programmability ultimately relies on interoperability, as noted above, to ensure that a digital dollar is usable across a range of digital economic spheres and use cases.

*14. Should a CBDC be legal tender?*

[No comment]

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

[No comment]

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

[No comment]

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

[Please see our more fulsome letter sent separately, which also contains citations.] PayPal has long worked to expand financial inclusion and health in the digital realm. We frequently work in partnership with banks and traditional financial institutions as a regulated financial services provider. We believe that a U.S. CBDC holds particular promise in advancing inclusion and financial health if it recognizes the benefits of open systems and broad distribution of digital dollars by regulated entities beyond traditional banks. More specifically, as our response notes, the traditional banking system has faced challenges in reaching all segments of the population, especially historically disadvantaged, minority, and low-income groups. Recent research underscores this dynamic by noting that non-bank fintech providers were far more effective in reaching minority-owned businesses during the COVID-19 pandemic to offer them Paycheck Protection Program (PPP) relief. For example, PayPal’s PPP loan program is over-indexed in the majority of the top 30 counties that have the highest density of Black business activity and heightened incidence of Covid-19. More specifically, the coverage rate for PayPal-facilitated PPP loans is above average in 23 out of these 30 counties, in sharp contrast to the overall PPP, in which the coverage rate is below average in 22 out of these 30 counties. Indeed, there is clear evidence that non-bank financial technology providers are increasingly providing key services for underserved women and minority consumers. For example, PayPal Working Capital (PPWC) loans are distributed to areas with greater concentrations of minority populations, helping to close the gap in access for minority entrepreneurs. The percentage of total PPWC loans going to census tracts with greater than 25% African American population share is slightly higher than traditional SMB loans (13% vs. 11%). Also, this same group of borrowers are growing more quickly than the average SMB (22% vs. 9%). Given the ability of non-bank fintechs to reach broader populations, it is critical that a U.S. CBDC be offered and distributed through both regulated banks and non-banks, including state-regulated money transmitters and trust-companies. As previously noted, distribution would likely occur through digital wallet services, which would offer tailored custodial and payments services. Such offerings are ideal products for fintechs, which specialize in nimble, consumer-friendly applications, as well as connectivity with other service providers. A U.S. CBDC offers a unique opportunity to leverage a broader set of regulated entities to help expand access to digital financial services. In addition, the Consultation refers broadly to three categories of money: Central Bank Money, Commercial Bank Money, and Nonbank Money. “Nonbank money” is a newly defined concept for the Fed, which “are broadly defined as institutions other than banks that offer financial services.” Thus, within this category of “nonbank money” are a range of financial products, from prepaid access and gift cards to money market mutual funds (MMFs) to stablecoins. This is a large category of numerous financial services providers, some of which are considered Commercial Bank Money, and each carry different levels of risk that should not be grouped together. Tc

be clear, when a customer holds a balance at a nonbank financial service provider, the funds underlying that balance are fully supported by permissible investments meeting outstanding customer liabilities, as defined by state banking law. For example, permissible investments include categories such as cash, bank deposits, and U.S. government securities. These are bankruptcy remote reserves that are available in the event of default by the service provider. This is just one category of non-bank money that is subject to rigorous state banking laws and examinations. By stating that Nonbank Money as a category contributed to the financial crisis, the Consultation casts a bold shadow across a significant segment of regulated financial service providers, most of whom were not contributors to those crises. As a result, we urge the Fed to discuss these various forms of financial products and services as distinct, each with varying levels of associated risk. Many of these firms have been helpful in supporting and connecting the global economy in a responsible way. As a bottom line, through these labels, the Consultation implies that providers of "Nonbank Money" may not be appropriate for holding and facilitating access to CBDC on behalf of customers which, in our view, would eliminate a significant benefit that can be achieved from a digital dollar.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

[No comment]

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

[No comment]

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

[No comment]

*21. How might future technological innovations affect design and policy choices related to CBDC?*

[Please see our more fulsome letter sent separately, which also contains citations.] As it stands today, the current payment rails are inconvenient and expensive, taking days to settle transactions, providing limited visibility to businesses conducting international payments, and charging high fees – especially to lower-income and underbanked segments of the population that are forced into costly check cashing, money order, payday lending, and remittance services. Technology and regulation provide an opportunity to reshape the financial system to benefit the underserved; to support businesses, professionals, and creators with faster, lower cost payments as well as access to credit; and, to relieve financial stress for the general public. Responsible innovation in payment systems, lending, digital currencies, digitized protocols, digital identity and in the fight against fraud and financial crime can bring a new era of equitable, low cost, and accessible financial services. The time is ripe to modernize and upgrade the technological infrastructure of the financial system – and we want to help businesses and consumers adapt and engage. The combination of public research funding, private innovation, global attraction of talent, and appropriate regulation cemented the role of the United States at the center of the digitization of communications, media, commerce, and financial services in the form of web 1.0 and web 2.0. Achieving the same leadership position in web3 is possible but should not be taken for granted. Advances in technology, including the use of digital assets and smart contracts, have the potential to fundamentally change the way in which payment activities are conducted and the roles of financial infrastructures. The introduction of a CBDC may provide an important foundation for beneficial innovation and competition in retail payments in the United States, giving people choices that feel meaningful to them and their financial health. Interest in CBDCs has accelerated over the past year and half because of the digitization of all economic activities, in part due to the COVID-19 pandemic. At PayPal, we have seen the digitization of verticals that have traditionally been brick and mortar, such as groceries and meals. We have also seen the growing importance of omni-channel capabilities for commerce, which is especially important as we support economic recovery by supporting the integration of small businesses into the digital economy.

We have been learning a great deal about CBDCs through our collaborations with institutions. This includes supporting MIT's Digital Currency Initiative (DCI) to advance its independent central bank digital currency research and development as well as participation in the Atlantic Council's CBDC Private Roundtable Series with the goal of making the technology more accessible and understood by the public. Additionally, in early 2022, we established a cross-disciplinary advisory council for our Blockchain, Crypto and Digital Currencies unit comprised of some of the world's leading experts in cryptography, distributed technology, regulation, economics and capital markets. We also have staff serving on the Digital Dollar Project's Advisory Board. We're committed to working with central banks and

regulators to help responsibly shape the future of digital financial services. We believe CBDCs could be a great addition to the payment options available to businesses and consumers and complement the current retail payments system.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

[Please see our more fulsome letter sent separately, which also contains citations.] The Consultation refers broadly to three categories of money: Central Bank Money, Commercial Bank Money, and Nonbank Money. “Nonbank money” is a newly defined concept for the Fed, which “are broadly defined as institutions other than banks that offer financial services.” Thus, within this category of “nonbank money” are a range of financial products, from prepaid access and gift cards to money market mutual funds (MMFs) to stablecoins. This is a large category of numerous financial services providers, some of which are considered Commercial Bank Money, and each carry different levels of risk that should not be grouped together. To be clear, when a customer holds a balance at a nonbank financial service provider, the funds underlying that balance are fully supported by permissible investments meeting outstanding customer liabilities, as defined by state banking law. For example, permissible investments include categories such as cash, bank deposits, and U.S. government securities. These are bankruptcy remote reserves that are available in the event of default by the service provider. This is just one category of non-bank money that is subject to rigorous state banking laws and examinations. By stating that Nonbank Money as a category contributed to the financial crisis, the Consultation casts a bold shadow across a significant segment of regulated financial service providers, most of whom were not contributors to those crises. As a result, we urge the Fed to discuss these various forms of financial products and services as distinct, each with varying levels of associated risk. Many of these firms have been helpful in supporting and connecting the global economy in a responsible way. As a bottom line, through these labels, the Consultation implies that providers of “Nonbank Money” may not be appropriate for holding and facilitating access to CBDC on behalf of customers which, in our view, would eliminate a significant benefit that can be achieved from a digital dollar.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The Federal Reserve's discussion paper on a potential U.S. CBDC raises many of the challenges that exist in the current domestic financial system: a lack of access to the formal financial system for low-income, unbanked, and under-banked individuals; slow and inefficient payment rails; and high transaction costs for cross-border payments and remittances. The discussion paper posits several possible designs of a CBDC that could solve these problems and the related benefits of solving them, including preserving the dominant role of the U.S. dollar in the global financial system. Financial technology can improve upon these conditions, but a CBDC is not superior to other private-sector led innovations. Many of the potential benefits of a CBDC detailed in the discussion paper are already being met by existing blockchain-based payment system innovations. This is particularly true as public blockchain technology reaches scale and begins to integrate as a settlement option among global payment providers, banks, and financial technology ("fintech") companies. Similarly, improvements to real time payment systems and wholesale payment integrations can satisfy policy goals for how people send, spend, save and secure their money – including in an internet-native form. Bringing stablecoins like Circle's USD Coin ("USDC") under common-sense regulatory guidelines would ensure proper supervision over an asset that is already achieving many of the Federal Reserve's objectives in a potential CBDC. In the longer term, the ability for existing blockchain-based payment system innovations to meet their maximum potential will be greatly enhanced once Congress passes a federal framework for regulating all digital assets. Circle agrees with the risks detailed in the discussion paper, but wants to highlight several others. Because the discussion paper focuses on an intermediated model for a CBDC that would preserve the two-tiered banking system, these comments will focus on the risks presented by an intermediated model. First, the discussion paper does not address the costs associated with researching, designing, implementing and maintaining a CBDC. A CBDC would require new technologies, additional human capital and a significant public educational campaign. These costs merit thorough analysis because, while the Federal Reserve is self-funded and does not receive Congressional appropriations, future Federal Reserve expenditures related to a CBDC will ultimately affect taxpayers.

Second, the discussion paper notes how a CBDC might support innovation. However, Circle is concerned that it would instead stifle U.S. innovation, particularly for new market entrants. Already, a host of companies, including Circle, have leveraged blockchain technology to support trillions of dollars of economic activity with fiat-referenced stablecoins. The introduction of a CBDC by the Federal Reserve could have a chilling effect on new innovations that could otherwise make the U.S. economy and financial sector more competitive both domestically and abroad. Finally, as detailed in response to question three below, Circle is concerned that a CBDC could in fact worsen issues related to financial inclusion and access. The implementation and deployment of a CBDC could further strain public trust in government and raise concerns about the level of control exercised by government over public money and the financial system. There are legitimate questions about whether a CBDC would remedy existing issues of trust and access for unbanked and underbanked individuals.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Many of the benefits of a CBDC are already being met by private-sector innovations, like USDC, through blockchain-based payment systems. USDC is a regulated, fully-reserved U.S. dollar digital

currency that is backed by cash and short-duration U.S. government obligations so that it enjoys price parity with the U.S. dollar. The reserves are held in the care, custody and control of the U.S.-regulated banking system and issued in compliance with money transmitter requirements. Each month, Circle publishes attestation reports by a global accounting firm regarding the reserve balances backing USDC in circulation. USDC does not detract from, but in fact supports, the dollar's role as the world's reserve currency. USDC has supported over \$4.3 trillion in on-blockchain transfers as of May 12, 2022, and over 70,369 active wallet addresses have conducted transactions with USDC in the last 28 days. These data demonstrate how USDC is generating novel economic activity based on the U.S. dollar. Private sector-driven activity using blockchain-based payment system innovations offer an alternative pathway to a resilient, dominant dollar in the face of centralized challenges from China and other countries proceeding with CBDC versions of their currencies. USDC has gained widespread market adoption and brought digital versions of the dollar to international markets in the global digital asset economy. The network effects of this widespread market adoption will continue to advance the cause of the U.S. dollar in digital form. USDC will continue to play a growing role in lowering the costs and increasing the speed of cross-border payments. In partnership with MoneyGram and the Stellar Development Foundation, USDC can now be used to efficiently send payments internationally at a fraction of the cost of traditional cross-border payments in fiat. Circle is also working to advance financial inclusion, starting in the United States. Circle's mission of raising global economic prosperity through the frictionless exchange of financial value is part of Circle Impact. Circle has allocated a meaningful share of USDC dollar reserves to community banks and Minority-owned Depository Institutions across the United States, strengthening their balance sheets and therefore communities. An additional pillar of Circle Impact is to drive digital financial literacy and entrepreneurial efforts in collaboration with leading academic institutions and other partners, including historically black colleges and universities; the first partnership is with Bowie State University in Maryland and Rhodes University in South Africa. Circle has established key partnerships to help combine some of the best practices of well-regulated, traditional financial and payments institutions with the inherent benefits of open, public blockchains; collaborations with BlackRock, Visa, Mastercard and Worldpay are just a few examples. Circle is also opening up new corridors to provide humanitarian relief in the U.S. and globally. For example, Circle has helped the legitimate, elected government of Venezuela distribute millions of dollars in desperately needed aid to the nation's front-line medical workers as they battled the COVID-19 pandemic under horrendous conditions. Circle partnered with the Bolivarian Republic of Venezuela (led by President-elect Juan Guaidó), U.S.-based fintech Airtm and the U.S. government to send the relief funds in USDC. The joint initiative established a disbursement pipeline that leveraged USDC to bypass the controls that Nicolás Maduro's authoritarian government placed on Venezuela's financial system. Circle's deep expertise operating USDC has also led to innovations that have the potential to address problems that have plagued society, in particular the challenge of verifying digital identity. About one billion people globally face challenges proving who they are, limiting their ability to access basic services and economic opportunity. In recent months, Circle has worked with Block, Coinbase and the Centre Consortium to develop Verite, a set of free, open source decentralized identity protocols and data models that allow people and institutions to cryptographically prove claims about their identities. Verite has the potential to reduce friction, protect privacy and increase compliance with Know Your Customer (KYC) and anti-money laundering and countering the financing of terrorism (AML/CFT) controls.

### *3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

The Federal Reserve should more clearly articulate how a CBDC would improve financial inclusion in the United States. A CBDC with financial institutions or nonbank financial service providers acting as intermediaries could simply replicate the current challenges for financial inclusion that exist. According to a 2019 FDIC study, one-half of unbanked Americans do not have a bank account because they cannot meet minimum balance requirements. This poses questions about whether the Federal Reserve would require financial institutions to waive these fees if an individual held CBDCs. Another one-third of unbanked Americans noted a lack of trust in financial institutions, which may not be allayed in an intermediated CBDC system. It is possible that because the public's confidence in government institutions and banks has been declining, a CBDC could make the unbanked or underbanked even less likely to engage with financial institutions. Other design choices could also harm financial inclusion; as noted, an interest-bearing CBDC could cause negative impacts to the two-tiered banking system and hurt consumer access to credit and/or raise the cost of credit, potentially increasing the number of Americans who are underbanked. Additionally, in a scenario where the Federal Reserve issues an interest-bearing or non-interest-bearing CBDC, individuals would presumably have two choices when holding their money at a financial institution or regulated non-bank financial service provider. Such an arrangement would add another layer of complexity to what many unbanked and underbanked individuals see as an already-confusing financial system and could negatively affect one of the key stated goals of a CBDC, namely promoting financial inclusion. Even the financially-literate may not understand the full implications of holding their money in CBDC versus commercial bank

deposits. It seems likely that should the Federal Reserve issue a CBDC, a significant public education campaign would be needed to overcome confusion about the new system and possible distrust in a government-supplied solution.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Monetary policy, conveyed through the two-tiered banking system, should remain a public sector sovereign activity under the independent oversight of central bankers. The introduction of CBDCs, which could have potentially corrosive pressure on bank deposits and increase consumer distrust in which forms of money are presumed to be the safest, could diminish the transmission chain of monetary policy. It is possible to promote fair, responsible free market competition for the movement of money within the oversight of central banks and inside the U.S. regulatory perimeter. One way to achieve this standard is to review the possibility of granting digital legal tender status to various forms of privately issued electronic money and digital currencies, where the underlying reserve assets are in the care, custody and control of the U.S. regulated banking system (and possibly even held directly with the Federal Reserve).

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

A CBDC, both in interest bearing and non-interest bearing forms, creates potential domestic flight-to-quality or flight-to-safety problems which could destabilize the two-tiered banking system. The potential systemic effects of a CBDC could pose serious and detrimental effects to the banking system and the wider economy. It is not clear from the Federal Reserve's discussion paper that a CBDC would avert run risk or other financial stability concerns. The report notes “[t]he ability to quickly convert other forms of money—including deposits at commercial banks—into CBDC could make runs on financial firms more likely or more severe. Traditional measures such as prudential supervision, government deposit insurance, and access to central bank liquidity may be insufficient to stave off large outflows of commercial bank deposits into CBDC in the event of financial panic.” In discussing solutions to such a problem, the Federal Reserve's discussion paper proposes limitations on the overall amount of CBDC that an end user could hold, or hold at a given time. Such limitations raise serious questions about the usefulness of a CBDC as money. The scenarios contemplated by the Federal Reserve could create more confusion for end users of a CBDC and raise the possibility of negative consequences for the broader financial system. The creation of a non-interest bearing CBDC to reduce flight-to-quality effects could cause confusion about the different “types” of money offered at an individual's bank or that individuals could hold. If a non-interest bearing CBDC were issued by the Federal Reserve, it is difficult to say how an end user might evaluate the choice of whether to hold their funds in a CBDC rather than a commercial bank deposit. Absent more information about end user choice and attitudes toward the use of a CBDC, the risks of a non-interest bearing CBDC versus commercial bank deposits remain unclear. The current model offered by privately-issued digital currencies provides an important “air gap” between reference assets – such as cash, cash equivalents and high quality assets inside the banking system – and tokenized assets on public blockchains that results in no new money creation and preserves the two-tiered banking system. Importantly, the transmission of monetary policy is also preserved. As cryptocurrencies, digital assets, and public blockchains have developed over the past decade, entrepreneurs in this space have built a \$2 trillion dollar sector. This period has seen risks, death spirals and failures, lessons learned and growing regulatory understanding and clarity on how to responsibly harness these innovations. These risks should remain within the free market. The United States should espouse and practice activity-based, technology-neutral regulations, and regulate the economic behavior of digital assets rather than a catch-all approach. Not all digital assets behave in the same way or perform similar functions. If a digital asset behaves like a currency or payment system, it should be afforded the benefits of digital legal tender status or conformity with well-laid money transmission, e-money, financial markets infrastructure and prudential rules.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Early evidence suggests the introduction of CBDCs could put domestic capital flight pressure on the two-tiered banking system because the presumption could emerge that a CBDC represents a lower-risk currency when compared to fractional reserve banking or other forms of money and payments in circulation. Additionally, depending on which form of CBDC is adopted, CBDCs could also disrupt other forms of payment and money circulation such as e-money and debit/credit card networks, among others. While a non-interest-bearing CBDC might limit the shift away from commercial bank deposits compared to an interest-bearing

CBDC, a non-interest-bearing CBDC could still pose risks to the two-tier banking system by introducing a “risk free” form of money that end users may prefer to hold and transact with. In this case, a non-interest-bearing CBDC arrangement would put pressure on the two-tier banking system by curtailing liquidity and the flow of funds through traditional payments processors, thereby shifting that activity directly within the scope of the central bank. Ironically the advent of the digital assets industry and blockchain-based payment systems, which were originally framed as threats to traditional banks and financial services firms, have created and protected wholesale industries in both the analog and digital financial markets. Continuing to harness this private sector innovation, while attracting the billions in investor capital and entrepreneurial talent into the world’s important financial centers – particularly those in the United States – can ensure an always-on internet economy exists amid global regulatory competition. Another challenge in the financial sector is that a CBDC could obligate banks, e-money issuers, card networks and financial technology firms, among others, to adopt a government-issued or mandated technology standard. This might weaken economic competitiveness and growth, potentially limiting payment system and money movement optionality in both domestic and cross-border settings. Finally, CBDCs could potentially diffuse critical financial crime compliance, anti-money laundering and other shared responsibilities in the financial sector for combating illicit finance. This is another area in which the advent of competitive blockchain-based payment systems is producing exponential gains in financial integrity and forensics.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public’s access to a form of central bank money that can be used widely for payments?*

The use of cash in the United States has been declining steadily over the last several years, in large part due to the advancements made by the private sector to improve the custody and payments of dollars. For instance, Worldpay found the use of cash declined by over twenty percent from 2018 to 2020 and will only account for ten percent of point-of-sale transactions in the United States by 2024. It is Circle’s view that the Federal Reserve should allow the private sector to continue to responsibly innovate to support consumer-driven trends away from cash as a means of payment. A CBDC would not be a substitute to the physical dollar; it would be more akin to a substitute for the privately-issued electronic money that individuals use today.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

The market and technological infrastructure for domestic and cross-border payments has changed significantly and quickly over the past three decades. USDC brings the benefits of digital currency – fast, lower-cost, highly secure, global and interoperable – without the drawbacks of extreme volatility that has plagued other cryptocurrencies. Fiat-backed stablecoins with transparent reserves have provided an efficient “digital dollar” settlement layer for digital asset trading markets. Through robust competition and growth in the digital asset space, stablecoins are now used in a wide-variety of applications. Other financial market participants, such as major credit card companies, small businesses, remittance companies and others are making USDC a native settlement option for their businesses. This increases market competition and choice for consumers for payments, while building a bridge between digitally-native financial services and real-world use cases. As mentioned in the response to question two, Circle is innovating in payments by partnering with Worldpay and Moneygram, and piloting new uses of stablecoins and digital assets to lower transaction costs and facilitate the efficient movement of money across borders using USDC.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Over 80 countries are in some stage of researching, developing, piloting or launching a CBDC to establish the dominant currencies of the internet. This is a high-stakes competition that will shape the political and economic value systems of this century’s digitally-native global economy. By nearly every measure, the United States and the U.S. dollar are already winning this digital currency race because of private sector innovation that uses open-source technology and open standards and protocols. While the United States considers ideas for a CBDC, a prospect that will likely take many years to develop and pose significant risks, private sector innovation is solving many of the intended goals of a CBDC. One reaction to the developing digital asset industry is to seek to heavily regulate and curtail free market activities, to nationalize the technology and infrastructure, and to launch and administer

government-controlled digital currencies. Some countries, such as China, have already taken this approach. The introduction of a CBDC might seem like the only logical U.S. policy response to compete in the digital currency space race. However, it is the values of openness, the preservation of privacy, free-market competition, and open intellectual property that have powered U.S. economic growth and made the dollar the world's reserve currency. These principles have helped the United States lead in internet technology standards and industries and are the same values that have led to the flourishing market for digital currency and blockchain technology today. Other countries are closely watching how the U.S. government proceeds with a CBDC, and so the United States should serve as a model for how to balance public sector oversight and private sector innovation. While the Federal Reserve may develop a CBDC with the proper guardrails to protect consumers, the U.S. cannot guarantee that other countries would do so responsibly and the U.S. should be cautious to endorse a system that could be easily abused by autocratic governments.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

The Federal Reserve's discussion paper does not expand on the potential adaptation costs associated with the implementation of a CBDC, including for businesses and individuals that would need to accommodate transactions involving a CBDC. These costs could range from new back-end settlement processes to customer-facing point-of-sale (POS) systems, and they could affect millions of businesses and individuals transacting with a potential CBDC. Additionally, financial institutions such as banks, credit providers, lenders and others could bear associated costs with absorbing a new asset class in the form of a CBDC, and integrating that asset within their existing systems – including determining how to offer novel products and services in a CBDC. Additionally, the paper does not discuss in detail how a Federal Reserve-issued CBDC would manage existing financial crime compliance programs used by financial institutions pursuant to the Bank Secrecy Act. Given the complexity and difference in approaches taken by regulated entities, the Federal Reserve should have more specificity for how the public sector might manage the risks, versus the current model that is dependent on the private sector. Privately-issued stablecoins represent a clear alternative to manage the risks and challenges of a CBDC that the Federal Reserve has outlined in its discussion paper, and to those mentioned above that have not yet been contemplated. The United States must still fully regulate the private issuance of digital currencies, like stablecoins, at the federal level. A well-designed federal regulatory regime for private stablecoin issuance would likely make a Federal Reserve-issued CBDC redundant. The timing of the deployment and implementation of a CBDC is also an important factor. As U.S. Treasury Secretary Janet Yellen said in an April 2022 speech, “[W]e must be clear that issuing a CBDC would likely present a major design and engineering challenge that would require years of development, not months.” The Federal Reserve's plan to launch the FedNow Service, a new instant payment system, provides an instructive example of the time that may be required to deploy a CBDC. It could be challenging for the Federal Reserve to issue a CBDC on a technology standard that does not quickly become obsolete, given the pace of technological advancements. In the meantime, trusted, regulated stablecoins like USDC are building on the latest technology – such as open, public blockchains, and blockchain-based payment systems – and meeting the market's demands for speed, lower costs and efficiency in a manner that is safe, transparent and compliant with existing regulations.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

The presumption of privacy and the universally free and lawful use of money is an important principle and human right. CBDCs and centralized payment system innovations, particularly those that are government-led or developed by potentially repressive countries, pose serious potential breaches of this public trust. The prospect of social credit scoring, deplatforming individuals from public money or creating financial redlines, among other risks, are real public policy challenges that should be considered when contemplating a CBDC. In the intermediated system described by the Federal Reserve, it seems likely that the Federal Reserve would, technically, be able to have access to an individual's interaction with a CBDC depending on the design structure. In this scenario, the transaction records, geolocation, and spending habits of end users might be viewable by the Federal Reserve and potentially stored in vulnerable “honeypot” databases. While digital assets in the past have been synonymous with anonymity and illicit activity, the industry is now moving toward standards that preserve an individual's right to privacy while allowing for the prevention and detection of illicit financial flows. This duality is critical for digital assets to be part of the domestic and international financial systems. Circle has, with other partners in the industry, developed Verite, a digital identity model that would provide a verifiable and proven identification that is scalable, usable by anyone, and interoperable across systems, while also providing

individuals with the certainty that only the minimal amount of information is shared (to protect their own privacy).

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

The centralized technological frameworks that are being proposed and evaluated to issue a CBDC could amplify existing cybersecurity vulnerabilities in the U.S. financial system, potentially exposing the Federal Reserve to new and worsening cyber attacks. The cyberattacks against Equifax, Solar Winds and the Colonial gas pipeline are just three examples of attacks that have had widespread, damaging implications for the economy in recent memory. However, the development of public blockchains continues to leverage the inherent cyber resilience of distributed systems. Just as the failure of any one bank erodes confidence in banking, a CBDC would also transition this risk to central banks, possibly negating the benefits of strategic risk-sharing structures and operational “air gaps” between participants in the financial system.

*14. Should a CBDC be legal tender?*

In May 2021, the Federal Reserve issued a public statement that said: “As the Federal Reserve explores the potential benefits and risks of CBDCs, the key focus is on whether and how a CBDC could improve on an already safe, effective, dynamic, and efficient U.S. domestic payments system in its ability to serve the needs of households and businesses. ‘We think it is important that any potential CBDC could serve as a complement to, and not a replacement of, cash and current private-sector digital forms of the dollar, such as deposits at commercial banks,’ [Federal Reserve Board Chair Jerome H.] Powell said. ‘The design of a CBDC would raise important monetary policy, financial stability, consumer protection, legal, and privacy considerations and will require careful thought and analysis—including input from the public and elected officials.’” As mentioned in previous answers, it is possible to promote fair, responsible free market competition for the movement of money within the oversight of central banks and inside the U.S. regulatory perimeter. One way to achieve this standard is to review the possibility of granting digital legal tender status to various forms of privately issued electronic money and digital currencies, where the underlying reserve assets are in the care, custody and control of the U.S. regulated banking system – possibly even held directly with the Federal Reserve. In his January 2022 testimony before the Senate Banking, Housing and Urban Affairs Committee, Chair Powell said that a CBDC could coexist with well-regulated, privately issued stablecoins. If the Federal Reserve issues a CBDC, it should be designed to ensure fair competition with private stablecoins like USDC. The Federal Reserve’s discussion paper contemplates both interest-bearing and non-interest bearing forms of a CBDC. The paper’s analysis of an interest-bearing CBDC indicates that an interest-bearing CBDC would likely replace cash and deposits at a commercial bank, contradicting the Federal Reserve’s desire for a CBDC to be complementary to cash and commercial bank deposits. While an interest-bearing CBDC might prove attractive to individual end users, such an arrangement raises intermediation concerns mentioned in previous answers. Further, as mentioned previously, if a CBDC is not designated legal tender, it would compel the Federal Reserve to communicate what incentive programs the private sector and other market participants would have to absorb a CBDC.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

*18. Should a CBDC have “offline” capabilities? If so, how might that be achieved?*

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Additional time should be spent investigating the costs associated with the maintenance of the technology associated with a CBDC. It is conceivable that the costs to maintain and update a Federal Reserve-issued CBDC that incorporates the latest technology stacks and network infrastructure would be substantial beyond the initial implementation and deployment stages. To manage these cost risks, it is possible that Congressional action in the form of new legislation and appropriations may be necessary. Additionally, there remain undiscussed adoption risks related to the centralized model for a CBDC. It is unclear from the discussion paper whether the Federal Reserve would implement an incentive structure for market participants to operate with a potential CBDC (including for businesses) and use it. And, if a CBDC were designated as legal tender, would market participants be compelled to use and accept it? As discussed in above responses, the introduction of a CBDC would necessitate robust public education around its purpose and use, not only for end users, but also for businesses and other financial service providers.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

First off i'd like to say the paper was thorough and covered a great deal of explanation in to how a CBDC would work. I believe there are a lot of potential benefits to having a CBDC. But one thing that was not explained is how small businesses that want to participate in being a distributor of CBDC, can participate in being a distributor of a US CBDC. It is very important that policy consideration think about supplier diversity in terms of distribution of CBDC.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

I like the direction of the potential benefits that you have laid out in this paper. It is important to know also that as time and society moves forward there will be features and functionality of CBDC that is unforeseen. It is very important however, that a full roll out plan for how SMB, underserved, and underbanked communities will be educated on the CBDC.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Yes, a CBDC could indeed affect financial inclusion in a positive and negative way. The execution of the roll out is the most important. Underserved communities need to feel trust from the federal reserve. There has to be a positive strategy when it comes to the education of CBDC in communities where financial literacy may not be taught, and financial inclusion is null.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

I actually think that a U.S. CBDC will actually make it easier for the Federal Reserve to implement monetary policy because they will be able to raise and decrease digitally in real time the supply of digital currencies. This will help with price stability based on the amount of currency in the economy. With a physical dollar you don't know how much is still in good use, or being stashed away. With a CBDC you can keep up with all that information in real time. In addition, receiving payments with a CBDC would make it easier for people without bank accounts to get paid. This will maximize employment.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

A CBDC could affect financial stability in communities that need it the most because of their ability to use it online and not have a bank account or credit card. My thought is that it would be a net positive. Some people don't have bank accounts and want to purchase things online, a CBDC would give people with smartphones the opportunity to shop online and get involved in the digital world. This brings us one step closer to being a frictionless economy. However it is very important that strategy is put in place to make sure that underserved communities have access to CBDC and the information they need to use it.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

A CBDC could affect the financial sector in a positive or negative way. It all depends on the exploiter. Just like money markets operate. When people want to use money they for good they will, and when they want to use money for bad they will. CBDC does not affect the thinking of the user. However, I believe that a CBDC is way more useful than a stablecoin because the technological advantage of having a stablecoin will be obsolete when a US CBDC is introduced. Our CBDC will be the ultimate stablecoin.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Having a real time data and strategy towards the distribution of the CBDC will mitigate any adverse impact of a CBDC. The goal cannot be to let the financial sector hoard all the CBDC and not provide equity to our citizens. It's very important that there is a full non biased approach to the creation and the distribution of CBDC. In addition, making sure that tools you can track and provide metrics are constantly adjusting to support the entire nation would be very beneficial.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes, absolutely. However, as older generations fade out, the new generation will be more digitally literate. And they aren't looking for cash as past generations hav. Generation Z and Generation Alpha do everything online, and they want their money instantly. However, cash is still helpful in so many ways. Like if the power in the world was to ever go off, cash will be the king. The main principles we want to follow in terms of money for payments is can it be used as medium of exchange, unit of account, and store of value.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

As our country grows and we become a more diverse nation, cross border digital payments will evolve. Right now a huge demographic of people in our country work hard in America, and then send money to their family back home. Services such a western union to send money charges astronomical fees that really affect the sender and receiver. Without a U.S. CBDC to send to families in other nations, cross border payment providers will continue to be a predatory business for companies charging high fees.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Well it's very important that we look at what other large nations are doing to see what works, and what doesn't work for their citizens, markets, and economy. With a growing power like China, we have to be diligent in our approach so that the Digi Yuan does not take over as the world strongest currency. There are so many variables that go into play. However the key metric we need to concise about is how secure, fast, and simple our CBDC is. In addition, we have to lead the world in our currency strength, so it's very important that our markets move smoothly with CBDC, and everyone in our economy is buying, selling, and receiving their money with simplicity through a U.S. CBDC.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Security is important, but my bigger concern is that the CBDC will be released into the ethos and the people who need access to it the most won't have access to it. It is very important to me to make sure that risk is mitigated. Because there are a lot of sharks in wall street that will see this as an opportunity for them to get more CBDC even easier.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

By using hash functions, and private keys to give to consumers instead of SS#. In the event of illegal activity you can still track down that individual.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

It's important that a transaction id is attached to every transaction. There should also be a digital footprint that will connect every transaction. Two issues I see are the problem of a

double spend, and hackers trying to hack. We have to be diligent in how to mitigate these risks. Security and constant observation is very important!

*14. Should a CBDC be legal tender?*

Yes, absolutely. If it's not a legal tender then what is the point? That is what separates our US CBDC from other stablecoins, or cryptocurrency. The U.S. CBDC should be a legal tender for all debts public, and private.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

That is a great question. Whoever has the most of it will be able to gain the most interest, but what about the everyday worker who does not have the ability to save their CBDC like someone rich. Someone who is rich will have two methods of gaining interest. One in the money market, the other in his wallet. If we do this then it is important that we at least grant every US citizen with a base amount of CBDC, that they will be able to keep to gain interest.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Yes, there should be a cap of \$1 billion. This allows scarcity, thus increasing the value of the U.S. CBDC.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

It is very important to have firms that have a focus on serving underserved communities, not only big financial institutions. Banks, digital payments processors, and non bank intermediaries can serve the role as intermediaries. However, it's important to know who is serving who, and how they provide the support and information needed to use CBDC. The role of the regulators should be to have full transparency with the intermediaries and the distribution of the fund as well as the equity that the CBDC is being distributed. SnapRefund is a great example of an intermediary that is focused on serving SMBs, underbanked, and underserved communities. It's important to have the right stakeholders that are doing things to help our community and nation.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes, all CBDC should have offline capabilities. This can be achieved through satellite and solar usage. We can develop a satellite that stores multiple servers that can connect to any wallet on earth offline. We can use solar energy to power the satellite, so long as the sun is shining and the satellite with the server is rotating in space. We will always be able to directly communicate with our U.S. CBDC digital wallet.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes, it should be. The whole point of a CBDC should be ease of use and acceptance through point of sale. Users will have a digital wallet with their balance of CBDC. When you purchase something, you can use a QR code, or just send it to a wallet address through email. Eventually we will have brain tech and the possibilities with brain technology matched with speed of payment, will be the foundation to a payment system that will be unmatched by any other nation. Imagine just thinking about making a payment with your brain and the you make a payment. These are a few of the possibilities once we maximize the ease of use and acceptance.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

The key is that no matter what payment platform one uses, that payment platform should be able to tap into the feds API, this will make sure all payment applications will be able to program through the feds interface. This will connect the U.S. CBDC to different payment platforms. In addition, new technology will have to be introduced that will build on top of the technical standard in today's platforms. As Web3 continues to grow with NFTs and the Metaverse a CBDC that is interoperable will be very important.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

We can never predict the future, we can only prepare for it. As Web3 moves incredibly fast

and society looks at different use cases for value. It will be very important for the U.S. CBDC be proactive in jumping ahead of the curve with the policy choices related to digital spending.

For example, with the growth of DeFi, how will policy make sure that people aren't being taken advantage of now that they have a CBDC and don't know what to do with it. What about education in CBDC? Policy should also include financial literacy with the distribution and reception of CBDC. Overall, I believe the future is bright based on the demographic of users that will find new, fun, and creative ways to maximize the use of CBDC.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

I really enjoyed reading the research and analysis on Money and Payments: The U.S. Dollar in the Age of Digital Transformation. The paper was very thorough in its approach and explanation of each point's design principles. My main concern is making sure that a CBDC is accessible and beneficial to all Americans, not just a few. This is the most important part. I have no doubt that the Federal Reserve will create a wonderful immutable CBDC, but the question is will everyone have access to it and who will distribute the CBDC. That is very important. In order to achieve the most beneficial potential of a CBDC we must make sure everyone knows what it is, how to use it, and where to find it. Thank you for allowing me to provide my feedback and being a part of this historical moment in our countries financial history.

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*Name or Organization*

*Industry*

Payment System Operator or Service Provider

*Country*

United States of America

*State*

California

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Governments and central banks around the world are focused on mechanisms for jumpstarting growth and digitizing their economies. In this context, interest in Central Bank Digital Currency, or CBDC, has accelerated. To the extent a decision is made to launch a CBDC in the United States, Visa believes that it should (1) be consumer friendly and accessible through a competitive ecosystem of digital wallets operated by commercial banks and fintechs, and (2) be able to be easily accepted at every merchant. We're eager to work with central banks at this important moment in time to create secure, convenient, and reliable CBDC that can seamlessly integrate with the existing payments ecosystem. There are many important considerations when governments are evaluating the development and implementation of a CBDC. We don't take a view on whether or not the United States should develop a CBDC, nor do we take the view that there is a single method or process for implementing a CBDC; however, we believe we have the experience in the digital currency space as well as the capabilities to help central banks explore and potentially implement CBDC. We share further details on Visa's position, experience, and capabilities in responses to the questions that follow.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

CBDC should be designed to address a specific problem or set of problems, as there are current payments mechanisms and systems that are already serving consumers well in the U.S., such as in the domestic retail market. As such, there is no "silver bullet" way to reap any such benefits of a CBDC. A CBDC should be seen as an extension of choice for consumers, further enhancing and evolving a competitive, dynamic, and innovative digital payments sector that is already delivering for varied consumer needs in many ways. For cross-border payments, there are several considerations. We agree with the Federal Reserve's analysis that while a CBDC may ultimately enable new ways to make cross-border payments, this activity is significantly more complex than the domestic payment scenarios described in the paper. We also agree with the Federal Reserve that improving cross-border payments through new technologies would require significant international coordination to address different standards, infrastructures, licensing, and regulations. Cross-border payments also bring with them higher compliance requirements in order to meet global anti-money laundering and terrorist financing ("AML/CFT") demands, as well as to ensure compliance with international economic sanctions. Depending on the design, a CBDC will not be immune from these frictions. As cross-border payment flows increase and new competitors enter the space, ecosystem participants have incentives to ensure that the system is as efficient as possible. For Visa, that means investing in new technologies and solutions that enhance our cross-border capabilities and make it easier for people and businesses to pay and get paid, such that they will choose Visa as the network of choice for any type of payment from anyone to anywhere, including person to person ("P2P"), business to consumer ("B2C"), business to business ("B2B") and government to consumer ("G2C").

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

CBDCs have the potential to extend the value of digital payments to a greater number of people and places. New forms of digital money offer the potential to unlock innovation and

enable new applications while meeting the Federal Reserve's objectives for inclusion, resilience, competition, and enhancing confidence in the U.S. financial ecosystem. The creation of a CBDC, however, in and of itself does not solve financial inclusion, and it is not obviously clear that a CBDC would be any more advantageous for financial inclusion than existing financial products and solutions. The effectiveness of a CBDC in improving financial inclusion will in part depend on how the Federal Reserve and the U.S. Government designs and markets a CBDC to encourage and enable widespread adoption. The Federal Reserve will have to ensure broad public approval for a CBDC, which will likely entail educating the U.S. public on the benefits of digital payments and providing or directing people to digital wallets or other applications to access a CBDC. Also, depending on the design, a CBDC could allow for application programming interface ("API") integration for digital tools to provide individuals access to additional financial services. This could conceivably make it easier for a regulated financial institution to conduct normal customer due diligence and know-your-customer ("KYC") procedures. Finally, depending on the design, a CBDC could ensure no minimum balance requirements, which could be important to attracting unbanked consumers to CBDC accounts.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Consistent with the G7's recently published principles for retail CBDC, it will be important for any CBDC to operate in an open, transparent, and competitive environment that promotes choice for consumers and competition between different parts of the ecosystem. We note that a vertically integrated system has the potential to stifle innovation and private sector engagement, which would be a risk to the U.S. financial system. Notably, the strong and dynamic competition in U.S. payments today has largely driven the highly innovative and tailored customer experience that consumers and businesses currently enjoy. In our view, the foundational elements when considering the components of a robust and well-functioning electronic currency are operational resilience, cybersecurity, and certainty of acceptance. A CBDC would be a new technology that will require sophisticated and complex interoperability for the entire U.S. Its issuance would require the employment of sophisticated and advanced risk management capabilities and investment, spanning fraud, AML and KYC controls, operational resilience and cybersecurity, which should not be underestimated by regulated entities facilitating CBDC transactions. Working with private sector entities that have expertise in these areas could be cost effective and also shield the Federal Reserve from execution risks, thereby preserving the Federal Reserve's ability to carry out its essential role of maintaining financial stability. A safe and secure payment ecosystem is critical for all currencies, whether it is fiat, stablecoin, CBDC or other form of digital currency. Importantly, for a digital currency to be trusted, reliable, and stable, it's critical that there are appropriate safeguards and standards for how underlying reserves are managed, so that consumers and businesses are able to redeem at par. Furthermore, it should be clear to consumers what rights they have when they hold a digital currency, including how to exercise available redemption rights if applicable. We believe that an integrated approach to fraud prevention, cybersecurity and cyber risk management is needed to enable optimal data sharing to mitigate and defend against increasingly sophisticated attacks from nation-states and transnational organized criminal and terrorist organizations. International payment networks, for example, offer the highest levels of cybersecurity and rely on global data for cyber threat and fraud analysis, which is vital to combating transnational malicious actors and reacting quickly to threats originating outside of the US. We also consider that the technical implementation of any CBDC environment may introduce additional systemic risk, including cyber risk, arising from the Federal Reserve's role. The architecture of a CBDC should consider the permissions for transfers enabled by the underlying CBDC infrastructure, any automation that could be introduced and the ability of account holders to trade CBDC balances between other CBDCs, international accounts or, through other clearing and settlement mechanisms, to conventional forms of money. With respect to certainty of acceptance, the most important factors for merchant acceptance are user base and the customer experience. In this regard, it will be important that consumers do not have to obtain or adopt new devices or technology in order to use a CBDC. Through working with the private sector, the Federal Reserve can leverage the infrastructure and expertise available in delivering the best service to consumers.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

We are unsure whether the further decline of cash should be a material driver for a retail CBDC. It is possible (and worth further analysis) that a token-based CBDC could address some of the consumer needs of cash – but in a more secure way. Nevertheless, we believe that if a CBDC is developed, it should be accessible to every U.S. citizen and business. Further, a CBDC must still be well integrated and interoperable with the existing payments system to ensure that it can be easily accepted. An open and technology-neutral approach is essential to foster competition and innovation.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Even in the current environment, we observe there is significant investment and innovation in addressing pain points in domestic and cross-border digital payments, including the development of faster payments systems by central banks and the private sector as well as private sector efforts to achieve greater interoperability, in order to connect endpoints using all available payment rails, whether they are ACH, card, or RTP-based. That said, as discussed in question 2, it is important for a CBDC ecosystem to support, and not complicate, an already robust cross-border payment system. While many of the CBDCs from other countries will likely implement some form of a digital ledger, it is unlikely that they all adopt the same stack of technologies and protocols due to, for example, different governance, market requirements, technology providers, and levels of monitoring and compliance standards required by central banks. This set of circumstances will likely occur whether or not the Federal Reserve pursues its own CBDC. At the same time, other types of non-sovereign digital payments, such as stablecoins, are also evolving. Today, most stablecoins are used to enable investment trading, but we anticipate that in time stablecoin usage as a means of payment will increase, provided that there are appropriate safeguards and standards for how underlying reserves are managed. In the absence of a Federal Reserve CBDC, we expect demand for stablecoins – that are redeemable at par to the U.S. dollar – may continue to increase. Absent efforts at ensuring interoperability among CBDCs, cross-border payments will be a natural challenge for any central bank pursuing CBDC. Individuals will expect to be able to use their CBDC for cross-border payments, just like they can with other digital payments, and may be frustrated with the friction that comes from different local systems or compliance requirements. This is why many central banks are taking a cautious approach toward enabling cross-border payments for CBDC. According to a survey by the Bank of International Settlements ("BIS"), only four central banks out of fifty respondents envisage permitting the use of their CBDC by nonresidents beyond their borders. In order to achieve cross-border interoperability for CBDCs, close coordination among central banks will be needed.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The decision on whether to introduce a CBDC rests with the Federal Reserve and the U.S. Government, and should reflect the Fed's objectives, priorities, planning, and resources and the specific use cases that the Fed is looking to address. Critically, we appreciate that the Federal Reserve has provided this opportunity for a public comment period on a U.S. CBDC. As discussed in question 3, a CBDC could have the potential to extend the value of digital payments to a greater number of people and places. Any CBDC undertaking, however, must be fully evaluated and the decision to pursue a CBDC should be based on clearly defined objectives. As the global leader among central banks, and as a thought leader, the Fed is in a position to influence the direction of CBDC exploration through international bodies such as the BIS, the International Monetary Fund ("IMF"), and the G7 and G20. We agree with past Federal Reserve statements that the U.S. does not need to be first and can gain from observing the successes and failures of other central banks exploring a CBDC.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

We agree with the consultation paper that a CBDC would need to be designed to comply with robust rules that combat money laundering and the financing of terrorism. Therefore, anonymity for CBDC transactions will likely have to be ruled out in order to comply with the Bank Secrecy Act (“BSA”) and sanctions laws. The same requirements that apply to electronic payments using traditional payment products involving fiat currency should equally apply to transactions involving any CBDC. As mentioned earlier, it is also important to put the creation of a CBDC in the context of not complicating cross-border payments. Today, the global AML/CFT regime, as championed by the Financial Action Task Force (“FATF”) and other international organizations, is a success story for international cooperation, standards setting and enforcement. We agree with an argument made in the October 2020 European Central Bank’s discussion paper that an ill-designed digital Euro (or any CBDC), “could constitute an attractive instrument for terrorist financing, money laundering and other cross-border criminal activities.” We strongly recommend working with the FATF, and other international organizations, on how to ensure that a U.S. CBDC does not impact the integrity of the global AML/CFT regime and norms. We appreciate this is a complex and nuanced question and will require a set of data values to guide the design, covering areas such as security, fairness and accountability, but believe it is important to get this question right.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

A CBDC poses two main cybersecurity risks: (1) the risk to the central bank’s new CBDC-supporting infrastructure, and (2) the risks to the private institutions supporting the distribution of CBDCs. Recent high-profile cyber attacks against central banks—for example, the attack on the Bank of Bangladesh in 2016 or the SolarWinds attacks in 2020—have demonstrated that government agencies such as central banks are not immune from nation-state cyber attacks, and may in fact provide attractive targets for such attacks. Once a CBDC is active, it will be a rich target for cyber criminals, or nation-states that want to infiltrate a nation’s critical infrastructures. A CBDC that provides a single source of transaction information is also at a risk of cyber espionage. As noted earlier, CBDCs may come under cyber attack even before they become fully functional, as cyber actors will seek to infiltrate the system’s architecture, hardware, and software supply chains. To defend against these cyber intrusion attempts from nation states and other sophisticated cyber actors, we recommend that central banks adopt two complementary mindsets that mitigate cyber risks. First, working closely with private sector partners, central banks should develop a robust cybersecurity risk management program to secure the part of the CBDC that are outside of the central bank’s direct control or the payments tier. Second, central banks should also develop a comprehensive cybersecurity risk management program for those parts of the CBDC infrastructure that are within the bank’s control, or in the infrastructure tier. While there are cybersecurity risks, such as double spend attacks that can occur at the user level, it is the cyber risks to the CBDC’s infrastructure that require the greatest attention. In order to mitigate these cyber risks, we would recommend the Federal Reserve CBDC design team adhere to the National Institute of Standards (“NIST”) Cybersecurity Framework. Moreover, given that a CBDC will also depend on external enterprises to help build and then ultimately distribute or issue a CBDC, we would also recommend the Federal Reserve leverage NIST’s Cybersecurity Supply Chain Risk Management Practices for Systems and Organizations, and apply a Zero Trust Architecture mindset. Both of these practices are consistent with the President’s Executive Orders of May 12, 2021 and January 26, 2022.

*14. Should a CBDC be legal tender?*

We recommend that a U.S. CBDC has the same legal properties as physical cash, and thus support that CBDC be legal tender. Relatedly, legal tender, even in digital forms, could be counterfeited. Therefore, Congress should conduct an analysis of how the U.S. Criminal code needs to be amended to prepare for the proper enforcement, and protection, of this new digital currency. For our part, we have provided a technical solution (see Visa’s answer to question 18) to prevent double spend attacks and other types of cyber exploitation.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Banks and credit unions have a natural role to play as CBDC intermediaries because of their experience in risk management (fraud, AML/KYC controls and cybersecurity) as well as with

customer relationships. The Federal Reserve may wish to explore whether similarly well-regulated nonbank entities have useful technology offerings that would benefit the Federal Reserve's vision of CBDC, including providing CBDC "wallets" to the public. It is important that the CBDC is implemented as a "platform" so that developers and other participants can build products that offer new access services, distribution methods, and related services to the public. Interoperability is a critical part of a functioning payment ecosystem. Currently, central bank money (i.e. cash) and commercial bank money trade at par and are fully interoperable. The Federal Reserve should consider how a CBDC will interoperate with cash, commercial bank money, and potentially stablecoins. One potential solution is the use of a CBDC intermediary that can operate as liquidity hubs, which help consumers convert between commercial bank money and CBDC. We note that Visa is well positioned to operate as a liquidity hub CBDC intermediary that enables interoperability among currencies and payment rails.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Visa believes that offline capabilities are an important consideration for a CBDC. In our opinion, offline capabilities would be most helpful in situations where the consumer is offline, but the business is online. This is analogous to the existing card present environment, where the card itself is intrinsically offline. A technical solution is possible for offline payments, i.e., an "offline" capability to create secure point-to-point offline payments using authorized hardware. An offline payment solution can be coupled with periodic online updates and syncing, which would enable: i. Regulators to periodically review and vet digital wallets for AML/CFT compliance, through periodic re-issuance of the digital certificates given to devices for offline enablement through the online server; and ii. The payment receiver to validate that all transactions are compliant. Periodic online syncing could support recoverability for an offline U.S. CBDC. A combination of additional factors such as biometrics, geolocation, and other factors used to authenticate transactions can also assist in authorizing transactions. A CBDC with controlled offline capabilities could enable both the Federal Reserve's aims of replicating key features of cash (when needed) and managing AML/CFT risk and compliance. Visa has published the following technical paper, available at <https://arxiv.org/abs/2012.08003>, on how to ensure secure point-to-point digital payments for a CBDC in an offline environment.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

A retail CBDC should be well integrated and interoperable with the existing payments system to ensure it can be easily accepted. An open and technology-neutral approach is essential to fostering competition and innovation. Common and interoperable standards are a key enabler to creating the right environment for making a payment system based on CBDC a success, and for driving consumer and business adoption. Ecosystem participants rely on standards to set rules and best practices. A common approach at the physical and technical levels can spur innovation through a developer-friendly ecosystem, drive seamless merchant acceptance and interoperability with existing payment systems, provide flexibility to preserve vigorous competition, and pave the way for cross-border use cases. Visa is in the process of exploring and developing new infrastructure that can help central banks and traditional financial institutions come together and build simple user-friendly services that can enable secure and efficient acceptance process. Our technical solution to enable acceptance, also known as the CBDC Payments Module, aims to provide an on-ramp for CBDC to existing payment networks in order for CBDC networks to easily connect to traditional financial service providers. For banks and issuer-processors, they will be able to connect into the module and integrate their existing infrastructure and be enabled to conduct critical activities such as issue CBDC-linked payment cards or wallet credentials for consumers to use.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

With respect to domestic payments, a CBDC could cause a fragmentation of the payments system if it is not interoperable with commercial bank money and private sector stablecoins. For example, there may be cases where the consumer wants to use a stablecoin for payment, but the merchant wants to receive payment in CBDC. A "liquidity hub" that can process currency conversions between CBDC, commercial bank money, and private stablecoins may help support interoperability. When it comes to international payments, it is critically important for a CBDC ecosystem to support, and not complicate, an already robust cross-border payment system that markets have come to depend upon. While most CBDCs will likely implement some form of a digital ledger, it is unlikely that they all adopt the same stack of technologies and protocols due to, for example, different governance, market requirements, technology providers, and levels of monitoring and compliance standards

required by central banks. This would, unfortunately, limit the interoperability of CBDC networks which is a crucial requirement for implementing frictionless, cross-border CBDC payments. Adding a novel technology and type of money, such as a CBDC, could further complicate these challenges for banks that are moving these transactions. The scope for innovation would be further strengthened by adoption of international standards, which promote interoperability through a common approach at the physical and technical level yet provide enough flexibility in implementation that preserves vigorous competition and the ability for differentiation across payment systems. This would enable both bank and nonbank payment providers to thrive and scale, and for consumers to have access to the cutting edge of global innovation. In contrast, a centralized model where central banks create unique standards and specifications could involve significant cost while excluding the developer ecosystem, undermine the role of international standards organizations currently working on standards for CBDC and blockchain technology, and inhibit potential interoperability and competition with other digital currencies (including CBDCs).

*21. How might future technological innovations affect design and policy choices related to CBDC?*

We believe that appropriately regulated private sector stablecoins are likely to grow in consumer adoption, especially as technological advancements develop with the underlying distributed ledger technology, and might achieve a significant percentage of the digital payments market. We also believe that there will be multiple stablecoins, which could lead to a fragmentation of the payments ecosystem. Currently, we see stablecoins existing on different blockchains, each with different features and functionalities. This potential fragmentation is concerning for two reasons. • The regulatory framework of stablecoins is currently still developing and not fit-for-purpose for payments, which could result in systemic risk to the financial system. For example, a stablecoin issuer could become insolvent if the reserves backing the stablecoin are of low quality or suffer a sudden drop in price. This raises the question of how stablecoin issuers should be safely regulated. Visa welcomes the healthy ongoing debate on the appropriate regulation of stablecoins and supports a regulatory framework that results in a robust stablecoin for payments that protects consumers. • As discussed above, a fragmented payments ecosystem may require an “interoperability layer” to allow easy conversions between different forms of digital currency (i.e. between commercial bank money, stablecoins, and CBDC). This interoperability layer does not currently exist. Who will handle currency conversions if a particular stablecoin becomes popular with consumers, but merchants continue to request settlement in commercial bank money, or a CBDC? With respect to a CBDC, this is a topic that the Federal Reserve should carefully consider, as consumers will expect a CBDC to be highly interoperable with commercial bank money and, in all likelihood, multiple dollar-pegged stablecoins.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

A tokenized CBDC would seem to be best placed to address the consultation paper’s objectives of expanding accessibility, including for the unbanked. For instance, a tokenized CBDC could make it easier to validate offline payments (Visa’s recent technical paper also includes further detail on this topic) and therefore also more easily replicate – and enhance – the attributes of cash. Finally, a tokenized currency is more flexible and conducive to building innovative products and solutions.

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*Name or Organization*

MassMutual

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

A balance must be struck in terms of consumer privacy while acknowledging that preventing and tracking illicit activity is an important aspect of our financial system. Financial transaction data is sensitive and private, and this sensitivity and privacy needs to be maintained. However, as the financial world further digitizes, we must safeguard the ability to transact freely in transactions that do not involve illegal activity. To the extent that privacy data is not protected, or that there is even an appearance that it is not protected, the likely success of a Digital Dollar with consumers would be reduced. Smart contract technology has the potential to improve both operational efficiency in the life insurance industry and the customer/policyholder experience through lower costs, greater access, and faster claims and payments processing. To further increase the benefits of a Federal Reserve issued CBDC and encourage innovation in the finance industry, the CBDC should be designed in such a way as to be interoperable across leading smart contract technology platforms. Having a trusted, widely accepted method of payment in the smart contract ecosystem is a key element to furthering the adoption of smart contract technology in the insurance industry. The involvement of private sector institutions in the design of payment rails is of paramount importance, acknowledging that this potentially introduces additional risks to the design and security process.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Some of the benefits could be achieved via the use of private sector “stablecoins”. This might allow the technological risks to sit with the private sector but would require a new regulatory framework given the lack of transparency in stablecoin reserves and other risks. In addition, private currencies are unlikely to garner the trust of a Fed backed digital currency and would be less likely to be used by institutions. The Fed’s real time settlement protocol will help from an institutional perspective, but is unlikely to satisfy consumers looking for faster, simpler, and more secure ways of interacting on a peer-to-peer basis and with businesses.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

To the extent that ease of use is high and the burden to sign on is low, the impact on financial inclusion would be positive. A digital wallet has the potential to give the unbanked a simpler, and potentially better way, to create an income history, pay bills, access credit, access insurance, transact cross border, and lessen onboarding and ongoing fees paid to existing financial institutions. However, the existing barriers to entry need to be understood to maximize the benefit for financial inclusion. Implementation details around KYC, who provides wallets, how wallets are accessed, minimum balances (if any), and where CBDC can be used are important and will impact overall success. Acknowledging that some citizens do not participate based on personal choice, the ease of use, ease of access, and ease of onboarding are paramount. Allowing interest on a small deposit or providing other incentives for the currently unbanked to open a wallet would positively impact inclusion. In addition, financial institutions may not operate in certain geographies because it is not profitable to do so. A CBDC may help to lower those costs and, depending on how it is utilized, may very well eliminate them. However, it is important to understand the reasons for financial exclusion, and any exercise to increase inclusion will necessarily include a broader set of reforms—not just a

CBDC.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

A CBDC coupled with a well-designed distribution and custody ecosystem could allow the Fed to distribute stimulus, tax refunds, and relief payments more quickly. If wallets are appropriately KYC'd, and technology is shared with states, it may also allow unemployment and other state-based payments to be transacted rapidly. A CBDC design that maintains the structure of the current fractional banking system should not disrupt the transmission of monetary policy. The ability to pay or charge interest on a CBDC could enhance the transmission impact. The COVID pandemic highlighted limitations of the Fed's ability to distribute stimulus broadly and rapidly.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

It is unlikely there would be an impact on financial stability, if a CBDC is introduced gradually and transparently. However, it would be a net positive to liquidity if transaction costs, issuance costs, and transfer costs are reduced.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Stablecoins are at a significantly different risk level than a Fed backed CBDC. Users of stablecoins should understand that their holding is backed by at least a portion of credit risky assets, creating a different risk profile. A stablecoin may have similar characteristics to a CBDC, but it ultimately looks like a money market mutual fund with risks of runs in times of stress. If there is no upper limit on consumer CBDC holdings, it is certainly possible that consumers would rather hold CBDC directly than commercial bank money. For example, if consumers can move from commercial bank money to a digital coin in times of banking stress, liquidity could be drained from the banking system quickly. However, means can be built into the system to overcome a potential reduction in commercial bank deposits such as paying no interest on CBDCs, or paying interest on only a limited amount.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

The primary tool that a CBDC may use to mitigate negative impact should revolve around depositary interest rates. These considerations would include whether a CBDC yields a positive or negative interest rate. A CBDC may pay 0% interest (no different than paper money) while commercial banks can and should pay something more. In such a case consumers would still be incentivized to hold much of their wealth in commercial banks and/or investments rather than in CBDC units.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes. Central bank money should not be the only kind of money, but it serves an important role as the most reliable alternative in a competitive marketplace of digital currencies. Additionally, a CBDC should have the ability to process offline transactions between wallets and other devices. It is prudent to not couple the ability to transact in CBDC with internet access. Maintaining central bank money, whether cash or digital, is paramount to financial stability. It is likely that the use of cash would decline given that the transaction costs (particularly in terms of time) are high for moving from digital money to cash money and vice versa.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Lack of a US CBDC has the potential to put the US at a disadvantage, particularly in cross-border digital payments as well as potentially putting at risk the long-term nature of the dollar as the largest reserve currency. Certain European and Asian countries are currently in the prototyping or use-case stage. In addition, non-regulated non-fiat cryptocurrencies may step into the space for both domestic and cross-border payments to the extent a regulated digital coin is not developed. This has the potential to introduce risks to the overall system that are not currently regulated. The use of institutional digital payments is unlikely to move to a non-CBDC, although use of non-USD sovereign digital coins will grow. A prudent step would be to focus on the domestic market first before expanding to cross-border payments,

whether individual or institutional.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The United States benefits in many ways from the US Dollar being the world's leading reserve currency. To maintain that position, the US Dollar must stay competitive as the global economy continues to digitize. The issuance of CBDCs by other large economies should not be viewed as a threat, but as an opportunity. More importantly, any US CBDC needs to be well thought out and not being first to market gives the US the chance to learn from other nations.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Thinking of a CBDC in terms of an alternative among many likely well-regulated private digital currencies should allow the CBDC to adjust its own design, learning from the mistakes and flaws of others as the preferences of economic actors become more clear over time. An important decision is whether a blockchain is used and, if so, whether that blockchain is centralized or decentralized. Security concerns will change based on that fundamental decision.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Access to a CBDC eligible wallet could follow similar KYC rules today to open a bank account. The wallet provider (eg. financial institution) could perform initial KYC checks before granting access to a CBDC wallet. It would then be clear, to other institutions, that the wallet is owned by someone who has been KYC-verified without sharing that person's identity. In this communication, the original wallet provider would not necessarily need to share sensitive PII but simply verify that the client is in good standing or share a limited set of PII as needed. This would reduce the instances of sensitive PII being shared for financial transactions which could improve client privacy and protections. That wallet can then be used to receive wages, transact, gain credit access, gain access to insurance products and other investments by interacting with other KYC-verified wallets. Wallet providers could then perform transaction monitoring, as financial institutions do today, to track any potential illicit activity. Additionally, CBDC transaction data shared outside the wallet provider (for example with government authorities) should be decoupled from the identities of the persons or entities completing those transactions. Similar to existing processes relating to warrants and subpoenas, CBDC wallet providers should only be required to disclose the identity of the owners of certain CBDC wallets if a government agency has received the necessary approvals to perform an investigation. Controls could be established in regulated wallets where transactions over a certain amount could be flagged.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

The risk of unauthorized access (hacking) will always exist. One should expect that non-US actors targeting US financial infrastructure will similarly target CBDC infrastructure. The risk is unavoidable but should be mitigated to the extent possible. Multiple copies of a "ledger" are likely necessary to decrease the risk of illicit transfers or spending, where transactions can be rejected in near real-time if multiple ledgers disagree. This may lead to a design where payments are delayed long enough for transactions that are illegitimate to be caught. Multiple ledgers could be used depending on transaction size that allow faster seeds for small payments while decreasing the speed of larger payments, with a true-up occurring at certain intervals.

*14. Should a CBDC be legal tender?*

Yes.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Interest, including negative interest, offers the chance to fine tune monetary policy. Moreover, the ability to control interest rates on CBDC could more quickly and more directly allow the Federal Reserve to implement its monetary policy strategies. In addition, CBDC balances up to a certain amount might pay interest as a means of bringing the unbanked into the financial system. However, the intention should not be to disintermediate the current financial system where interest is paid for risk. A CBDC should be designed such that interest rates can be

increased or decreased as necessary for policy implementation.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

A balance needs to be struck between allowing freedom of movement of capital while acknowledging that unrestricted movement may exacerbate bank runs in times of stress. A reasonable bank account and wallet holder may be incentivized to transfer their bank holdings to a direct obligation of the Fed when banks are most in need of that capital. However, with FDIC insurance on consumer bank accounts (effectively making those balances direct obligations) and the bank resolution framework to protect creditors, that risk is infrequent in the current state. It is possible that the frequency could increase as transaction costs are lowered and speed of transfer is increased. There should be limits on unrestricted transfers, with differentiation between end consumers and institutions in terms of limits.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Initially, banks that accept and issue physical cash should serve essentially the same function with digital currencies. A starting point would be to utilize institutions that already have access to the Fed window. However, the market should evolve to allow other financial institutions to act as intermediaries. To the extent that those institutions are willing to satisfy the regulatory and compliance burden, they should be allowed to participate. The regulatory structure should be similar to structures already in place for banking institutions, with a robust audit process to create confidence.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Offline capabilities should be included, up to a certain limit. This would be crucial for rural and remote areas, or in the case of natural disaster. A design could leverage technologies like NFC to facilitate offline transactions between wallets. Once those wallets regained internet access, an asynchronous "true up" of transactions and balances could be performed to appropriately ledger those offline transactions. In addition, offline wallet balances need to be coded such that there is a minimum balance of \$0 and have balances that are calculated in real time, to avoid a double spend. Time limits and maximum spend limits should also be considered when operating offline.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes. Similar to physical cash, it should be a design objective of a CBDC to facilitate broad, fast, and simple transactions throughout the economy. As to how to achieve this objective, there are several strong examples in the digital payments industry today that could be used as inspiration. APIs need to be designed to provide quick and robust communication between consumers, the goods supplier, and the government or financial institution.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

There are likely multiple different designs that could achieve this goal. Technological history suggests standardized protocols such as HTTP and email protocols have been successful in facilitating adoption across multiple platforms. A similar set of standards could facilitate wide adoption and transferability of a CBDC while also leaving room for innovation and development in the private sector. There are many projects operating in the digital asset ecosystem that are focused on portability across blockchains. A government working group or entity would need to lay out the rules around transferability, although the technology likely exists in the private sector.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

There are substantial tradeoffs in each of the design principles discussed in the paper, many of which we have discussed above. The benefits of a CBDC should be focused on the speed and ease of transactions for consumers and institutions, maintaining the dollar as the primary reserve currency, financial inclusion, and allowing policymakers to quickly provide payments

to citizens in a targeted manner. 1. Anonymity versus criminal activity 2. Interest paying versus financial stability 3. Portability of KYC versus centralized control 4. Processing speed versus security 5. Offline and peer to peer payments versus risk of fraud 6. Centralized versus decentralized ledger 7. Smart contract complexity versus massive payment capacity

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*Name or Organization*

National Consumer Law Center (on behalf of its low income clients)

*Industry*

Consumer Interest Group

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District of Columbia

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

a. Misuse of CBDC technology to monitor or control spending by public benefits recipients. A CBDC could be used to make benefits payments. As one blog notes: "A government-issued CBDC would allow the government to dictate how, where, and when currency holders spend their funds. As an example, consider unemployment money issued in the form of a CBDC. The government could restrict the funds to not work at businesses categorized as liquor stores or bars." TANF recipients are already prohibited from using their cards at liquor stores, 42 U.S.C. § 608(12), even though for those without transportation or in neighborhoods without convenient grocery stores, the corner store holding a liquor license is also the place to buy milk and bread and use the ATM. Lawmakers have intruded on the privacy of poor people and restricted where they can use or access their money to undermine support for public benefit programs. Even if monitoring or restrictions were initially prohibited, a future Congress could authorize them. b. Fraud at greater scale and velocity with no protection. The paper mentions the risk of money laundering and the financing of terrorism but does not address the potential explosion of other financial crimes like fraudulent inducement scams. A CBDC would "need to be final and completed in real time," leading to the same fraud problems that have plagued Zelle and Venmo. Problems could be more widespread with the ubiquity of a CBDC. While Zelle and Venmo – as the middlemen between the sender and receiver – play a role in fraud prevention and error resolution, what role would the Fed play? Moreover, the EFTA lacks adequate fraud protection for instant push-payment systems like CBDC transactions. See more in our digital wallets hearing statement. Fraud problems would be compounded if nonbanks were allowed to be intermediaries (see below). c. Reduction in access to credit. Banks would have less capital and less money to lend, and perhaps would be less inclined to lend money to people who keep their funds in CBDC. d. Cost of accounts. Intermediaries would likely charge for accounts to access CBDCs, as they would bear costs in administering them and providing access devices. The accounts could be costly for low-income consumers given that banks would not benefit from the use of the funds or interchange fees. Any CBDC legislation should guarantee free or very low-cost (\$5/month) access to accounts with no overdraft or NSF fees. e. Unclear coverage and application of the EFTA. The EFTA provides the core protections for accounts and payments but only for transfers that authorize a "financial institution" to debit or credit an "account." Legislation must ensure that CBDC is covered. But adapting the EFTA to CBDC would raise many knotty problems. Error resolution could be complicated – who is responsible, the federal government or the intermediary? Will they work together? f. Unclear application or preemption of other important state and federal consumer protection laws. Federal and state laws have important consumer protections for bank accounts and money transfers, and it is unclear whether they would apply to the federal government or to CBDCs. Particular laws might have definitions or a scope that do not contemplate CBDCs or funds held by the federal government. Critical laws include state laws that limit bank account garnishment by judgment creditors, federal rules that financial institutions must follow before allowing garnishment of Social Security, the FCRA (which applies to account screening agencies), and bankruptcy laws. The government does not have processes in place to ensure compliance with many of those laws. Courts might find that the federal government is not subject to states laws or might erroneously treat private intermediaries as exempt agents of the government. See *Starr Int'l Co. v Federal Reserve Bank of NY*, 742 F.3d 37 (2d Cir. 2014). Any rules should explicitly subject CBDCs and CBDC accounts and payments to all applicable state and federal laws. g. Easier for garnishment by debt collectors and the government, including for the wrong amount or

against the wrong person. Debt collectors could have an easy, central place to go to serve garnishment orders, evading state protections against wage garnishment by garnishing wages after they are in a CBDC account. It is unclear if state garnishment protections would apply to the federal government, and the government may not be equipped to comply with 50 state laws. Collectors routinely pursue debts not owed or fail to serve consumers with notice. The government could also much more easily empty out accounts without court process, similar to what is currently done with tax refund offsets, but with more dire effects on regular income needed for necessities. h. Reduction of community reinvestment activities. The Community Reinvestment Act only applies to insured depository institutions. Funds in CBDC accounts might reduce bank CRA obligation

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

To promote financial inclusion, financial institutions should be required to offer Bank On accounts with low monthly fees and without overdraft or NSF fees. The CFPB should adopt rules to prevent abusive use of overdraft fees that push people out of accounts. The rules governing international remittances should be improved to address hidden costs. See CFPB junk fees comments. From the consumer perspective, it is hard to understand any significant benefits of a CBDC; any benefits seem far outweighed by the potential risks and uncertainties described above. The paper identifies five potential benefits but does not really explain how a CBDC would provide any benefits to consumers beyond what FedNow will provide. The potential benefits of a CBDC should be more clearly explained. Even for the benefits already stated in the paper, many can be better achieved in other ways. The discussion paper identifies four potential benefits: (1) "Safely meet future needs and demands for payment services." What needs and demands would a CBDC serve that today's money, coupled with FedNow capability, will not? Digital money in the form of commercial bank money is widely available and deposit insurance makes that money safe. For individuals with accounts under \$250,000, the risk of a bank failure is both remote and, even if it occurs, results in little disruption. Many new payment mechanisms have emerged using today's digital money. To the extent that a CBDC is aimed at more safely serving the audience that is using stablecoins and cryptocurrencies, a CBDC will not be an alternative for those who are interested in investment speculation or a payment system outside of government control. (2) "Improvements to cross-border payments." How would a CBDC improve cross-border payments? The major problems today are due to inflated and hidden costs imposed by remittance providers, and the costs of and delays posed by the sending and receiving infrastructure. See CFPB junk fees comments. It is unclear how putting a CBDC in the middle would change anything significantly. Stronger rules to make remittance fees transparent and protect consumers from errors and liability would do more to improve cross-border payments. Moreover, faster, final CBDC payments to international locations could increase payment fraud and make it harder to reach scammers. (3) "Support the dollar's international role." This may be a benefit on the macro level, but it does not impact consumers individually. (3) "Extend public access to safe central bank money". Why is commercial bank money with deposit insurance not good enough for consumers with less than \$250,000 in one account? What would the public gain from such access? Additionally, many immigrant communities are fearful of central bank control over currency, preferring to remain unbanked or bank with smaller community banks. See more below. (4) "Financial inclusion." Any benefit is not explained and is better addressed through other measures. See below.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

It is difficult to see how a CBDC could help financial inclusion, especially in an intermediated model. A CBDC would pose the same issues that keep people out of banks today: Mistrust of banks, not enough money, cost of accounts, KYC and checking account screening agencies. Mistrust of the federal government and privacy concerns could compound those reasons. A CBDC could hurt financial inclusion if (1) it became the de facto preferred payment system but many consumers were shut out of or distrustful of it, or (2) it deprived banks of the capital and funding used to support low-balance accounts.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

7. *What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

8. *If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

It is more important to prevent impediments to the acceptance of cash and the ability to use cash than it is to create a new form of central bank money. It is important to preserve a form of money that (a) can be used by those shut out of bank accounts either because they don't trust them, can't afford them, or are improperly blocked by fraud/account screening controls, and (b) can be used anonymously. But CBDC would not achieve this.

9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

The discussion paper understates the challenges of ensuring privacy, dismissing those concerns quickly by stating that a CBDC would be "privacy protected" and that, in an intermediated model, "intermediaries would address privacy concerns by leveraging existing tools." But our national privacy laws are woefully inadequate. CBDC must not enable the federal government – or intermediaries – to have more personal information about individuals than they do today. To the extent that privacy laws do apply, they do not address the issues posed by the federal government's access to data generated by use of CBDCs, even in an intermediated model. CBDCs may also enable collection of more detailed information about spending and payments than today's forms of money do. Moreover, even if legislation establishing a CBDC had additional privacy protections, those protections are likely to be a compromise and less robust than state protections – and yet there will be a push to preempt state protections. Data uses also change making it difficult for legislation and regulations to keep up with the growing use and commercialization of data. But it is also critical not to facilitate illicit financial activity— not just money laundering and the funding of terrorism, but also scams. Much more robust KYC controls and monitoring than we have today are necessary to ensure that accounts do not provide a vehicle for scammers to receive funds. Will the Fed or intermediaries monitor CBDC accounts to ensure that they are not being used for illegal activities or to pass funds onto scammers, even if the threshold is less than the \$10,000 for mandatory SARs? With a fast and final payment system like CBDC, robust fraud monitoring of receiving accounts is essential.

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

14. *Should a CBDC be legal tender?*

Yes.

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Only insured depositories whose parent companies are subject to the Bank Holding Company

Act should be allowed to serve as intermediaries. Nonbank entities and ILCs that do not have the same full oversight and obligations of insured institutions should not be allowed, as explained in our comments on the Fed's proposed guidance on access to master accounts. Allowing nonbank intermediaries would be especially problematic given the lack of federal supervision and the bigger problems they have had appropriately handling KYC issues. Nonbanks have both permitted widespread opening of fraudulent accounts (not only for stimulus money but also as vehicles for receiving money from payment scams) while at the same time overreacting to fraud concerns and shutting down or freezing legitimate accounts and preventing people from accessing their money.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

If possible, any CBDC should have offline capabilities that sync up once the user is back online. To the extent a CBDC is a cash replacement as cash usage and acceptance decreases, it is still helpful to have a form of payment usable by those who do not have smartphones and for use when there is no internet connectivity, including in rural areas and during times of power outages and natural disasters. Moreover, even if a CBDC has offline capabilities – and especially if it does not – it is still important to preserve access to and acceptance of cash.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

A CBDC should be designed to be usable at the point-of-sale. Money management is more difficult if funds are siloed into different assets that can be spent in limited ways. POS use emphasizes the need for EFTA protection and the chargeback rights that credit cards have under TILA. A CBDC used at point-of-sale without chargeback rights would be less safe than a credit card, and less safe than a debit card if there are issues regarding EFTA coverage or enforcement (see above).

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Interoperability is essential. Funds must be easily convertible, at no cost, between CBDC and bank deposits. Otherwise, if funds are siloed between two types of money, both are less useful, as families living paycheck to paycheck will face more challenges in trying to access and spend their funds on day-to-day obligations.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The Digital Dollar Project (DDP) is a non-profit organization with a mission to encourage research and public discussion on the potential advantages of a digital dollar, convene private sector thought leaders and actors, and help inform national policy. The DDP looks forward to the Federal Reserve Board's (FRB) planned deeper studies into financial inclusion and programmability as key benefits of a Digital Dollar. Although the FRB paper discusses various applications and use cases for CBDC, the paper doesn't discuss interoperability in detail, a feature that will be critical for widespread adoption and utility. By acting as a base layer for digital economic activity, CBDC could facilitate interoperability globally across digital asset networks. Designing a CBDC that enables intelligent interoperability to connect with current and future financial infrastructure systems domestically and abroad would advance the dollar's role in global transactions such as trade or remittances. In the FRB discussion paper, there is also an absence of the potential benefits that CBDC could provide to wholesale settlements and capital market infrastructure. As tokenized economies emerge, a natively tokenized US central bank currency could complement the account-based Fedwire and FedNow systems and provide a modernized payment system. CBDC settlement for clearing and settlements could reduce counterparty risk and trapped liquidity, increase capital efficiencies, provide a more efficient, automated workflow, guarantee that cash and securities are delivered, and provide added transparency to regulators. While these benefits have been proven in other pilots globally, the DDP is pleased to explore further and quantify the benefits of CBDC settlement to support the US post-trade infrastructure during the Lithium Pilot Program with the DTCC (1). The data and outcome of this pilot will be made broadly available to the public and the Federal Reserve Board members in their consideration of a CBDC. (1) Learn more about the Lithium Pilot Program with the DTCC, [www.dtcc.com/news/2022/april/12/dtcc-building-industrys-first-prototype-to-supports-digital-us-currency](http://www.dtcc.com/news/2022/april/12/dtcc-building-industrys-first-prototype-to-supports-digital-us-currency)

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Although there are diverse payment solutions in the US, a Digital Dollar is the only medium that could provide a digital and cash-like bearer token issued by the central bank. It is possible that the benefits of CBDC can be idiosyncratically addressed by other solutions; however, they likely would be point solutions, whereas a tokenized CBDC offers the potential for an extensible system that could be built upon and enable a new ecosystem of services. Furthermore, a CBDC is the only instrument that could provide the transactional benefits of digital currency with the stability, trust, and risk weighting of central bank money. A CBDC is not antithetical to the development of other digital assets, and rather provides consumers greater optionality across payment types and digital asset activities. The DDP envisions CBDC as an underlying asset network upon which industry participants could provide unique and customized services (e.g., digital wallets, banking capabilities, stablecoins, and automated payment information).

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Depending on design choices, CBDC could provide financial institutions and financial technology companies – in partnership with community outreach efforts -- with the underlying

CBDC technology upon which to build inclusive payment and banking services. Regulated institutions can develop digital wallets that provide unique services and cater to distinct user bases. The DDP believes that lower operational, technology, and regulatory costs related to offering digital wallet solutions for the custody of tokenized digital dollars may hold advantages over traditional bank accounts in terms of expanding access to underserved populations. For example, if designed with assured privacy and manageable onboarding, CBDC could provide a more accessible and less expensive option for traditionally underbanked communities who pay high fees to access the digital payment ecosystem. Financial inclusion benefits will also depend on design considerations such as maintaining a cash-like model that provides offline payment abilities, privacy, potentially tiered identity verification requirements, and distribution through the two-tier banking system, inclusive of regulated fintech companies. The BIS has recently posited that although not a panacea, central banks could use CBDC as a tool to promote financial inclusion in "promoting innovation in the two-tiered payment system, offering a robust and low-cost public sector technological basis and novel interfaces, facilitating enrolment and education on CBDC, and fostering interoperability among multiple dimensions". (2) Privacy will be critical to realizing the potential inclusion benefits of CBDC. Some portion of the unbanked prefer not to place their money in banks due to privacy concerns, and these people seem unlikely to transact heavily in a CBDC unless they are confident that privacy is assured. Similarly, while it is vital to ensure robust KYC and other financial crime protections akin to what banks and other money services businesses have in place today, it will be critical to assure that these processes do not come at the cost of preventing people from accessing CBDC. Given how challenging it is to accurately verify identities, a better system for digital identity, or at least standards for such a system, could facilitate broad access to financial services when linked with CBDC distribution. In cases of disaster relief, such as distributing COVID relief funds, the US found challenges mainly in identifying the proper recipients, rather than a function of the speed in the payments systems. (2) BIS, "Central bank digital currencies: a new tool in the financial inclusion toolkit?" <https://www.bis.org/fsi/publ/insights41.htm>

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

The Federal Reserve should view a US CBDC as a policy tool, not as a policy expression. Implementation of a digital dollar should be monetary policy neutral, without a view on issues of money supply. It is reasonable to expect that the Federal Reserve will be no less prudent in deploying and managing CBDC than it is in respect to the existing money supply.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

The impact of CBDC on financial stability will depend on how a CBDC is designed and deployed. The DDP recommends that the Federal Reserve continue its approach of engaging with the private sector to understand design requirements and build public confidence. If appropriately designed and distributed through banks and regulated intermediaries, with programmable money features, the negative effect of CBDC on financial stability could be negligible. A CBDC should not include features that would hinder the US Dollar as a store of value and safe-haven asset. There are appropriate concerns that a US CBDC might decrease money held in commercial banks. But without empirical data to gauge user habits, there is a lack of evidence to support any assumption of a change in commercial bank usage. There is also the potential that CBDC increases the flow of money into the banking sector, especially if previously un-or-under-banked communities shift US CBDC into bank accounts because of the ease of doing so. Only pilot projects of CBDC usage conducted under real-world conditions can generate the empirical data to know whether mobile devices and digital wallets provide attractive on-ramps for underbanked populations to move US CBDC to banking services offering interest on deposits and government insurance. Only real-world testing can answer whether the greater ease in converting commercial bank money into digital dollars would make people more or less likely to do so in a panic. More specifically, it is very possible that if consumers know they can readily convert commercial bank money (or FDIC insurance payouts) into a digital dollar, then there would be less reason to run on a bank.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Concern has been raised that introducing a CBDC could lead to a disintermediation of the banking sector. However, the magnitude of potential impact is unclear and will depend on the design of a CBDC and how attractive it is to hold and use, compared to commercial bank money. The desire for consumers to hold and use CBDC tokens will depend on design considerations such as privacy, programmability, interoperability, and public confidence. To get these considerations right, the Federal Reserve should engage with the public to

understand preferences and design trade-offs. Higher levels of disintermediation could have implications for the efficiency of credit provision in the economy – specifically, leading to more expensive credit and tighter lending criteria (already a challenge for the underserved communities). It is arguable that without safeguards or system assurances on convertibility, CBDCs could exacerbate financial instability during periods of economic stress as people would likely seek to substitute bank deposits with CBDCs. The same set of trade-offs that exist today between cash and account-based funds, such as immediate access, security, interest on account, and access to other financial services, will also apply to greater or lesser degrees in a future of CBDC and online banking. If consumers are confident in their ability to exchange CBDCs for FDIC insured commercial bank money, the banking relationship should mirror the current cash model.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

The impact of CBDC on the financial sector will largely depend on the design and deployment of the network. Decisions such as issuing a non-interest bearing CBDC, and not providing FDIC insurance over CBDC tokens should mitigate any adverse impacts of CBDC and maintain the existing cash usage model. To understand and mitigate any potential adverse impact(s), the Digital Dollar Project (DDP) encourages the Federal Reserve to work with private institutions and participants to understand how they would use a CBDC. Regulators can learn more about the implications of a CBDC issuance by performing gaming simulations, pilot programs, and research studies with broad stakeholder involvement. To this end, the DDP intends to facilitate exploratory pilot programs with industry participants to further inform the Federal Reserve and the public on the implications of various CBDC use cases. (3) (3) "Digital Dollar Project to Launch Pilot Programs to Explore Designs and Uses of a U.S. Central Bank Digital Currency" [newsroom.accenture.com/news/digital-dollar-project-to-launch-pilot-programs-to-explore-designs-and-uses-of-a-us-central-bank-digital-currency.htm](http://newsroom.accenture.com/news/digital-dollar-project-to-launch-pilot-programs-to-explore-designs-and-uses-of-a-us-central-bank-digital-currency.htm)

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

As economies and people become increasingly digitally connected, the government should consider offering an alternative to central bank issued physical cash that is natively digital and prepared for ongoing migration of economic activity to a digital environment. A CBDC that resembles cash could maintain the existing usage of money while capturing the consumer preference for electronic, non-account-based payments. A CBDC could co-exist as a viable, third format of US currency, alongside cash and reserve accounts. A well-designed, intermediated CBDC with programmable money features could enable low- or zero-cost transfers through new models of custody and transaction rails, to be determined through experimentation.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

In the past decade, there has been substantial advancement in digital payments. In some cases, private and public sector actors are developing scale payment platforms that can serve billions of users. These platforms are usually accounts-based and centralized, which raises privacy, resiliency, and security concerns. If countries like the U.S. do not actively explore payment system design, it is likely that foreign centralized, scale platforms will gain further market share. Robust discussion around privacy expectations and practices may also be neglected. Domestically, retail and wholesale stablecoin payment solutions are testing traditional account and message-based payment networks. Programmable money is a powerful tool that will continue to provide automation benefits from smart contracts, such as reoccurring and fractional payments across open economic systems. Stablecoin solutions are growing and evolving rapidly, though would benefit from clear and coherent regulatory frameworks. In March 2022, the transaction volume of stablecoins backed by dollars was worth \$500 Billion. (4) Although the leading stablecoins are denominated in dollars, the US should further solidify dollar-denominated digital networks. These payment networks are typically underpinned by the Dollar, which still requires the movement of dollars at the end of the transaction. A CBDC could make stablecoin transactions more efficient by connecting stablecoin networks to CBDC networks. In the absence of a US CBDC, foreign CBDCs and scale payments networks will increasingly provide modernized payment rails across wholesale and retail users. (4) In March 2022, the transaction volume of stablecoins backed by dollars was worth \$500 Billion, [www.theblockcrypto.com/data/decentralized-finance/stablecoins/adjusted-on-chain-volume-of-stablecoins-monthly](http://www.theblockcrypto.com/data/decentralized-finance/stablecoins/adjusted-on-chain-volume-of-stablecoins-monthly)

*10. How should decisions by other large economy nations to issue CBDCs influence the*

*decision whether the United States should do so?*

The decision of other large economy nations to issue CBDC will have a meaningful impact on global finance and America's economy. Preserving the dollar's central role in the global economy is an appropriate and correct objective of US policy. Foreign countries are developing CBDC capabilities to replace traditional payment rails and provide CBDC as a service to global financial participants. The global leaders of CBDC exploration will dictate the technology and standards in CBDC development. The DDP hopes that the US will take a leadership role and design a CBDC that upholds our democratic values of freedom, economic stability, and personal privacy. In a CBDC future, the US should be engaged and lead discussions regarding governance, interoperability, security, privacy, and scalability standards, rather than reacting to foreign CBDC decisions. CBDC usage for wholesale transactions will be critically important to facilitate the continued role of the dollar as an international trade settlement currency. Recent work internationally has demonstrated the utility of a wholesale CBDC. The Banque de France demonstrated the ability to settle in a foreign currency outside of the issuing nation while still providing transaction data to the issuing central bank. (5) The BIS has been exploring the requirements to link wholesale infrastructure to CBDC networks. This work portrays an important ability for global nations to use central bank money. Overall, while technology is but one factor underpinning global currency use and adoption, it is an important one – the US must future-proof the role of the Dollar in an increasingly digital world. In early 2021, the Hoover Institute convened a working group of distinguished experts in national security, finance, economics, central banking, technology policy, and computer science to study the global implications of the digital yuan (e-CNY) China's central bank digital currency. During the period of study, over 250 million Chinese people have opted into the e-CNY. In March 2022, the working group issued its analysis (6), which detailed the degree to which China has established first-mover advantage in, not only the deployment, but the technical underpinnings of CBDC. The study notes that e-CNY will be a digital substitute for paper money, grant more Chinese people access to the banking system, and provide Beijing with greater oversight and control of business and individual financial transactions. It warns that the e-CNY enhances Beijing's ability to exercise political control over Chinese society and provides a significant opportunity for China to cement its international leadership of payment technology innovation and adoption, set economic norms and technical standards that align with its authoritarian governance system, and increase its ability to undercut the traditional dominance of the US dollar as a source of geo-economic and strategic influence. The Hoover study warns that the spread of the e-CNY might diminish the role of the dollar as the world's reserve currency and undermine the ability of the US to deploy financial sanctions against rogue international actors. The Hoover study proposes a pathway toward revitalizing US financial leadership on the international stage in the digital age. It calls on the US to respond to a spectrum of key policy concerns raised by the e-CNY and improve incentives for innovation and competition in its own payment systems. It advocates expediting development of technology and standards for a possible digital dollar affirmatively committed to democratic norms of privacy, accountability, transparency, and security in shaping the global rules surrounding central bank digital currencies. The Hoover study offers three broad recommendations for a US response to the emergence of non-USD CBDC: The US should launch a well-resourced CBDC research and development effort drawing on the talent of US government, private sector, and university actors to ensure privacy, prevent illegal payments, and provide for a competitive and innovative payment landscape. The US should establish a strategic plan for payment systems in the US digital economy that provides for the development of data privacy standards and the integration of CBDCs, fast-payment systems, and private payment arrangements, such as stablecoins. The US should step up to lead the development of an international regulatory framework around digital currencies, including CBDCs, that prioritizes consumer protection, privacy, financial anti-crime compliance, financial stability, and the protection of monetary sovereignty. (5)

[www.banque-france.fr/en/communique-de-presse/banque-de-france-bank-international-settlements-and-swiss-national-bank-conclude-successful-cross](http://www.banque-france.fr/en/communique-de-presse/banque-de-france-bank-international-settlements-and-swiss-national-bank-conclude-successful-cross) (6)

[https://www.hoover.org/sites/default/files/research/docs/duffie-economy\\_digitalcurrencies\\_web\\_revised.pdf](https://www.hoover.org/sites/default/files/research/docs/duffie-economy_digitalcurrencies_web_revised.pdf)

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

The Federal Reserve should continue CBDC experimentation with the private sector on diverse use cases to understand potential risks associated with CBDC. Real-world testing and engagement is necessary to uncover CBDC implications on markets and users.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

The geo-political and economic challenge of China's e-CNY is significant and should not be ignored. Yet, it should also not be overstated or feared. The goal of a free society should not be to emulate a closed one. The US did not vanquish the Soviet Union by emulating the USSR's failed centrally controlled economy. Rather, the US out-performed and better served its citizenry through the efficiency and dynamism of its free market, incentive-based private sector economy and the endurance of its aspirational ideals of individual liberty. The challenge of the e-CNY calls for a similar return to free society fundamentals. If the US is to assert a leading role in setting global standards for CBDC, just as it was a leader in setting the standards for the first wave of the Internet, then it must expand its exploration of CBDC itself. But it must do so in a way that is consistent with democratic values of individual liberty, freedom of speech, personal privacy, limited government, and the rule of law. Some of those ideals are set out in the US Constitution including freedom of speech, assembly, and worship and the Fourth Amendment's right to personal privacy. From that amendment stems a body of jurisprudence defining the balance between an individual's right to privacy and the federal government's limited ability to abridge that privacy in pursuit of legitimate law enforcement, national defense, or other overriding objectives. Although a right to financial and information privacy is not specifically established by the Fourth Amendment, for the last half-century courts have generally protected privacy using a doctrine called "reasonable expectation of privacy." Even so, Fourth Amendment privacy protections have been eroded considerably since the attacks of September 11, 2001. In fact, no account-based financial transactions are truly private because, in every case, they require personal identity as a prerequisite step. The Fourth Amendment's jurisprudence needs to evolve further in this digital era to renew the balance between economic privacy with other societal priorities. There is no "consumer transaction" limitation contained in the Fourth Amendment. Privacy protections, constitutional or otherwise, must clearly apply to data generated by all legal use, not just consumer use, of a US CBDC if it is to enjoy broad societal support. The Digital Dollar Project believes a well-functioning US CBDC should be private, secure, accessible, and transparent (7). Without inviolable protections for such civil liberties as freedom of speech, assembly, free enterprise and individual economic privacy, a US CBDC would be no more worthy of a democratic society than the currency of an authoritarian one. The American people – and free people everywhere - have everything to gain by encoding into a US CBDC stout protections for individual liberty and privacy. The US has everything to lose by neglecting it. The issue is essential to the future of real democracy. With the proper Fourth Amendment jurisprudence and thoughtful design choices relating to anonymity and individual privacy, a US CBDC could well enjoy superior privacy protections than many competing instruments—whether provided by commercial interests or other sovereigns. A US CBDC may have certain advantages over non-sovereign stablecoins if it is properly and affirmatively bound by constitutional Fourth Amendment protections, to which private stablecoins would not be subject. Coding traditional democratic ideals of economic liberty and privacy into a US CBDC will greatly enhance its global appeal. Hundreds of millions of people here and abroad may well be reluctant to surrender their economic security and autonomy to authoritarian state surveillance simply for the convenience of digital payments. As it has often in its history, the US has the opportunity to lead in a way consistent with its finest ideals. Protecting constitutional privacy rights while ensuring effective law enforcement can be achieved by taking advantage of the design flexibility of digitally based CBDC where technology constraints are less restrictive of policy objectives than traditional analog systems. A US CBDC could be constructed to provide privacy to citizens by maintaining a two-tiered banking system where banks, fintechs, and other service providers conduct identity verifications, just as they do in today's model. Identity verifications can be tiered and specific to the type of activity that customers are conducting. Identity management can leverage zero-knowledge-proofs and verifiable credentials to maintain data privacy. Criminal activity enforcement should follow today's existing legal model where financial institutions have oversight over their customers, and the government can only access customer user information through a subpoena. (7) [http://digitaldollarproject.org/wp-content/uploads/2021/05/Digital-Dollar-Project-Whitepaper\\_vF\\_7\\_13\\_20.pdf](http://digitaldollarproject.org/wp-content/uploads/2021/05/Digital-Dollar-Project-Whitepaper_vF_7_13_20.pdf)

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

One of the key attributes sought by many central banks in developing a new, independent payment rail that can be used by consumers and businesses alike in times of a national crisis. The design of a CBDC should be flexible and modular to foster operational and cyber resilience as the network continues to scale. Notwithstanding these features, it remains an open question what type of payment rail or system should underpin a CBDC, and the Fed is largely silent on this topic in its discussion paper. The DDP strongly encourages the Fed to focus exploratory work on appropriate CBDC rails as ultimate selection will have a profound impact on system governance, interoperability, security, resiliency, and privacy. More specifically, CBDC rail options range from a centralized government database to open public blockchains to middle-ground permissioned blockchains with curated nodes and validators.

While testing is necessary to better understand technical, operational, and governance implications of underlying CBDC rails, DDP suggests that the Fed should avoid pursuing a highly centralized database system. Such an approach could raise critical security and resiliency concerns. A highly centralized database would also raise privacy concerns given the “honey-pot” of information contained in a centralized place. Finally, a centralized database would likely have interoperability disadvantages relative to more open ledger designs. A likely preferable design approach would focus on a DLT-based or inspired CBDC network that prevents a single point of attack. If designed as a distributed network, such a network would definitionally be a more resilient and redundant data construct. Additionally, a blockchain-based CBDC could utilize a multi-signature wallet to stop single-channel attacks. Funds could be verified and transacted locally within a wallet. If a CBDC enabled offline payments during low or no network connection, the system would be resilient to operational failures or disruptions such as natural disasters, electrical outages, and other issues. To this end, systems designed with distributed architectural components and validations can continue to operate when other parts of the network are offline or unavailable. In an extreme case, if the entire system goes offline, then the ability to conduct transactions offline allows digital currency to exhibit a degree of resiliency regardless of its online/offline status. Offline transactions will no doubt have limits as security of these transactions are directly proportional to the storage capacity in secure end-devices such as chip cards or secure storage options. Unavoidable cyber risks include cryptographic algorithm insecurity over the lifetime of any digital currency used. Digital currencies are typically comprised of cryptographic keys that are intended to be resistant to attacks. There is a direct correlation between the strength of algorithm used, the size of the cryptographic key material, the compute time to generate the encrypted or signed data, the time value of the data, and the compute time to cryptographically ‘break’ or compute the above with access to the key. Evaluation of cryptography durability is an area of focus and exploration for central banks. Much like how security features on old physical bills are easier to replicate, the design must consider a modular infrastructure that prepares for advancements in attack capabilities. Certain security features may have tradeoffs that reduce functionality or may not be enforceable, e.g., recall old digital currencies and re-issue new ones. Further exploration and experimentation into the design requirements of diverse use cases will help shed light on the potential risks and design trade-offs.

#### *14. Should a CBDC be legal tender?*

As a complement to cash, which holds legal tender status, a CBDC should be treated the same as its physical counterpart. Of note, however, legal tender status in the US means something different from most countries. Neither the statute (31 US Code § 5103) nor any federal law compels an individual or entity to accept currency or coins as payment for goods and services. Therefore, legal tender status would not guarantee CBDC acceptance.

#### *15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Like physical cash, which does not pay interest, a CBDC should not pay interest. Notably, most countries exploring CBDCs around the world do not propose to pay interest. While an interest-bearing CBDC could serve as a monetary policy tool, it would compete against existing depository institutions with negative implications for the financial sector, including potential bank disintermediation, increased cost of credit, and possible disruption of money market funds and other short-term assets. Further, elevated redemptions to a US CBDC during times of financial stress could exacerbate a troubled economy. Importantly, a renumerated CBDC would make it attractive to hoard money, whereas today, it is impractical to store significant amounts of cash. An interest-bearing CBDC also raises the possibility of negative interest-bearing CBDC tokens, incentivizing dollar spending but lowering public confidence in dollars. Critically, implementing an interest rate on CBDC could have other far-reaching ramifications, including the heightened risk of the Federal Reserve being viewed as an agent of the government rather than the independent institution it is intended to serve today.

#### *16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

If a US CBDC does not bear interest, consumers will likely be incentivized to continue to hold their money in an interest bearing commercial bank account as opposed to accumulating significant CBDC holdings. This of course is dependent on economic considerations such as how much interest is being paid and current inflation rates. CBDC could be perceived as a safer alternative to other government liabilities (e.g., Treasuries subject to interest rate and liquidity risk). DDP believes that the key questions are whether the impacts on the structure of the banking system or the implementation of monetary policy under extreme scenarios would be significant enough to warrant imposing and enforcing limits. Limits would ideally be avoided in the long-term, but perhaps considered during earlier, testing phases.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

A fully mature CBDC ecosystem will require healthy involvement from diverse intermediaries. CBDC is a government responsibility, but one that most thoughtfully and carefully integrates with private sector technologies and intermediaries. CBDC infrastructure will require similar industry involvement as existing cash, commercial bank, and reserve-account payment infrastructures that require significant involvement from the private sector to control onboarding, security, governance, management, and reporting. Commercial banks, technology companies, fintechs, retail users, clearing and settlement institutions will all be key partners and will require regulatory frameworks that ensure healthy network usage. With respect to distribution of CBDC, it is important that the Fed leverage the commercial capabilities of the private sector in order to maximize access and financial inclusion benefits. For this reason, as previously noted, a digital dollar should be offered to consumers through banks and regulated fintech firms. Fintech, in particular, holds promise in broadening distribution of digital wallets in order to reach un-and-under-banked individuals. With respect to CBDC payment rails, the private sector should be involved in helping to develop and operationalize the system. For example, if a blockchain-based system is developed, then private sector entities, including non-profits or newly-formed utilities, could be tasked with helping to validate and maintain the distributed ledger. Careful governance requirements would need to be crafted regarding the specific roles and access to information of participants. By using innovative cryptographic technologies across operators and participants in a CBDC network may be able to enhance privacy and limit any one actor's access to sensitive payments data.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

One of the key desirable features enabled by digital currencies is offline payments. Similar to the features of cash and banknotes, the offline capabilities of CBDCs are a crucial enabler and necessary for addressing remote users, stability in emergency scenarios, or potential network outages. Offline capabilities of CBDC have a unique set of challenges, namely the reconciliation of transactions that have been performed offline with the 'normal' state of the CBDC ledger when the wallet goes back online. Security controls at the endpoint prevent a user from double spending, and risk mitigation via transaction limits and volumes will prevent runaway conditions, if these controls are ever circumvented. The security controls are typically secure elements that have been deployed over many decades and have been battle-tested to provide security and resilience to cyber-attacks. Offline capabilities of CBDC are a risk management decision, and although there may be hesitation to enable this capability, there are various controls and mitigations that can enable offline features. Importantly, offline transaction capabilities preserve the existing cash ecology, which is inherently offline and peer-to-peer. The Digital Dollar Project intends to further explore technical architectures and requirements of offline transactions through future pilot programs.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

To support wide ranging use cases, a CBDC will need to enable transferability across traditional and DLT-based networks. CBDC development should consider emerging token standards, such as SWIFT's intended use of ISO-2022 (8) as viable future token networks that will aim to connect with future CBDC networks. In a CBDC system with diverse intermediaries, its design will need to support payments across networks and share transactional data. Earlier this year, Michael J. Hsu, the Acting Comptroller of the Currency spoke about the need for architecture standards and interoperability across stablecoin networks (9). Hsu mentions that "without interoperability amongst USD-based stablecoins [and CBDC], the risk of digital ecosystems being fragmented and exclusive (with walled gardens) is heightened". CBDC architects should consider that digital asset networks will be commonplace in the future, and CBDC should be designed to support and enable those networks. (8) <https://www.swift.com/standards/iso-20022/iso-20022-programme/timeline> (9) Acting Comptroller of the Currency, Michael J. Hsu, Remarks Before the Institute of International Economic Law at Georgetown University Law Center "Thoughts on the Architecture of Stablecoins", April 8, 2022  
<https://www.occ.gov/news-issuances/speeches/2022/pub-speech-2022-37.pdf>

*21. How might future technological innovations affect design and policy choices related to*

## CBDC?

The inevitable evolution and advancement of technology should encourage architects to design an adaptable CBDC that can scale modularly over time. The foundation of a US CBDC network should set a framework that can evolve as technology changes as well. Quantum computing will challenge CBDC features such as hashing lengths as it matures. Careful design and testing will reveal evolving risks before they can occur. Healthy regulation and standards will also ensure that network intermediaries adhere to best practices and protect the network from bad actors.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Considering the potential adoption of a CBDC, architects should consider the technical and functional requirements across diverse use cases. Throughput and transaction speed will be important scalability requirements as adoption increases. A tokenized architecture, that doesn't rely on account and messaging systems, has proven to be a superior CBDC design choice in many overseas CBDC experiments to address scalability requirements.

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*Name or Organization*

*Industry*

Other:

*Country*

United States of America

*State*

New York

*Email*

**1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?**

The Depository Trust & Clearing Corporation (“DTCC”) in conjunction with its SEC-registered clearing agency subsidiaries, the National Securities Clearing Corporation (“NSCC”), Fixed Income Clearing Corporation (“FICC”) and The Depository Trust Company (“DTC”) appreciates the opportunity to provide comments to the Board of Governors of the Federal Reserve System (“Federal Reserve” or the “Fed”) in response to its recent paper, “Money and Payments: The U.S. Dollar in the Age of Digital Transformation” (the “Fed Paper”). DTCC supports the Federal Reserve’s efforts to foster a transparent dialogue around central bank digital currency (“CBDC”) and ongoing experimentation and analysis of the potential benefits and risks of a U.S. CBDC. We applaud the Fed’s ongoing international collaboration, including with central banks, the BIS and the FSB, in addition to the work the Federal Reserve banks are undertaking, including the Boston Fed’s collaboration with MIT’s Digital Currency initiative. DTCC, through its subsidiaries, is the largest post-trade market infrastructure for the global financial services industry. NSCC, FICC and DTC have each been designated as a systemically important financial market utility by the U.S. Financial Stability Oversight Council pursuant to Title VIII of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010. At DTCC, we are continually working to innovate and embrace new advances in technology, such as distributed ledger technology (“DLT”), tokenization and other emerging technologies. Indeed, DTCC is actively progressing a number of initiatives, including Project Ion which introduces new clearance and settlement functionality, leveraging DLT to help bring about new efficiencies in clearance and settlement (See DTCC Sept 2021 paper, “Building the Settlement System of the Future”). In terms of the request for additional policy considerations and potential benefits or risks, as the Fed continues its analysis of a potential U.S. CBDC, DTCC encourages ongoing review of the applicability and impact of CBDCs used in wholesale transactions. We believe that considerations such as standards to facilitate interoperability among potential CBDC platforms and digital identifiers are foundational to successful CBDC deployment and adoption. Given the highly interconnected nature of today’s markets, trusted financial industry service providers with a core focus on risk mitigation provide a key role in adopting standards and governance, which are critical to building safe and efficient markets. Given DTCC’s view noted above and based on our role in facilitating clearance and settlement activities in the U.S., DTCC is currently analyzing wholesale CBDCs and recently announced a pilot initiative in collaboration with the Digital Dollar Project and Accenture (See DTCC April 2022 press release). Specifically, we are developing a prototype (“Project Lithium”) to explore how a CBDC might operate in the U.S clearing and settlement infrastructure leveraging DLT. While DLT is not a pre-requisite for issuance of a CBDC, Project Lithium will measure the potential benefits of a CBDC and also outline any unintended consequences or challenges the pilot may uncover. In particular, Project Lithium will test how a CBDC could enable atomic settlement, which is a conditional settlement that occurs if delivery and payment are both received at the same time (real-time delivery versus payment, or DVP). As part of these efforts, Project Lithium intends to identify how the value of DTCC’s clearing and settlement service, including reduced counterparty risk, increased capital efficiency, automated workflows and added transparency for regulators is further enhanced by a CBDC supported on a DLT platform. DTCC recognizes that whether to advance a potential U.S. CBDC is a decision that resides with the Federal Reserve and appropriate policymakers. Thus, Project Lithium is intended to assist in laying the groundwork for the financial industry and policymaker community to better evaluate the implications of a wholesale CBDC across the trade lifecycle. Findings are anticipated to be released in the second half of 2022. DTCC

looks forward to sharing findings and lessons learned with the Federal Reserve, other policymakers and the broader industry as part of ongoing efforts to explore the benefits and challenges of a U.S.-backed digital currency.

2. *Could some or all of the potential benefits of a CBDC be better achieved in a different way?*
3. *Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*
4. *How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*
5. *How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*
6. *Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*
7. *What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*
8. *If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*
9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*
10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*
11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*
12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*
13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*
14. *Should a CBDC be legal tender?*
15. *Should a CBDC pay interest? If so, why and how? If not, why not?*
16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*
17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*
18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*
19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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***1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?***

While this paper highlights a number of critical benefits, policy considerations, and risks associated with the introduction of CBDCs, from a risk standpoint, we noted that ensuring the proper measures were in place to ensure effective sanctions compliance was not addressed. In light of the significance of this issue, particularly at this moment in time, we thought it was important to note that any future CBDC framework must include requirements to ensure effective sanctions compliance. As illustrated by the October 2021 “Sanctions Compliance Guidance for the Virtual Currency Industry” issued by OFAC, effective sanctions compliance requires, “the use of geolocation tools to identify and prevent IP addresses that originate in sanctioned jurisdictions from accessing a company’s website and services for activity that is prohibited by OFAC’s regulations.” OFAC Director Andrea Gacki has also emphasized the importance of such tools for purposes of effective sanctions compliance, stating the following at a recent ACAMs Sanctions conference: “We’ve been highlighting the importance of using geolocation tools as an effective internal control both in our sanctions compliance guidance for the virtual currency industry...but also through our enforcement actions.” In summary, any future CBDC framework that is established must contain requirements for effective sanctions compliance consistent with OFAC requirements and recommendations.

***2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?***

***3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?***

***4. How might a U.S. CBDC affect the Federal Reserve’s ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?***

***5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?***

***6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?***

***7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?***

***8. If cash usage declines, is it important to preserve the general public’s access to a form of central bank money that can be used widely for payments?***

***9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?***

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

As recognized in this Paper, ensuring that proper measures are in place to prevent CBDCs from being exploited for fraud or illicit financing is a critical priority. Establishing effective digital identity verification and authentication requirements are critical to fulfilling this objective. As we noted in question one above, and consistent with the recommendations of the Financial Action Task Force (FATF), a core pillar of effective digital identity frameworks is verification and authentication of advanced geolocation data (including GPS; cellular; and triangulated WiFi data). Accurate geolocation is intrinsically tied to true digital identity authentication. Previously, an individual's address was an important part of their identity. However, when transitioning to the digital world, geolocation becomes a building block of identity, heightening the need to transform the way identity and effective risk-based approaches are thought about. Location security facilitates robust and effective risk management processes by enabling early detection of suspicious activities and a holistic overview of real-time and historic behavioral patterns. Moreover, authenticated geolocation and location spoofing detection (via VPN, proxy, virtual machine, emulators, etc) are at the core of preventing synthetic identity and identity theft fraud from taking place and proliferating.

In future circumstances when the Federal Reserve and therefore the CBDC is providing economic support or crisis relief, such as through stimulus benefits or other forms of economic relief, implementation of robust and effective risk management procedures, including digital identity verification and authentication will be essential to mitigate potential risks and prevent the proliferation of fraud. FATF offers a comprehensive illustration of the role that device-based geolocation data can play within the realm of CDD, AML, and CFT in multiple reports. Please see below for FATF recommendations regarding the importance of leveraging advanced geolocation data. For example, in its 2020 Guidance on Digital Identity FATF states: "Digital ID authentication for authorizing account access may enable regulated entities to capture additional information, such as geolocation, IP address, or the identity of the digital device used to conduct transactions. This information can help regulated entities develop a more detailed understanding of the client's behavior as a basis for determining when its financial transactions appear to be unusual or suspicious and may assist law enforcement in investigating crimes." Additionally, in its Updated Guidance For a Risk-Based Approach to Virtual Assets and Virtual Asset Service Providers (VASP), FATF states: "...in conducting CDD to fulfill their obligations under Recommendation 10, VASPs should obtain and verify the customer identification/verification information required under national law... Additional, non-core identity information, which some VASPs currently collect, could include, for example, an IP address with an associated timestamp; geolocation data; device identifiers; VA wallet addresses; and transaction hashes." Moreover, in its report entitled "Opportunities and Challenges of New Technologies for AML/CFT", FATF states:

"Additionally, onboarding tools that allow for quick CDD and client traits analysis (such as geolocation, credit checks, anti-fraud software, and others) would also enrich the CDD and monitoring process and lead to a more accurate understanding of the nature of the business relationship, as well as its impact to the institutions." Lastly, in their "Guidance on Proliferation Financing Risk Assessment & Mitigation", FATF states: "Investment in technology and advanced software, capable of machine learning and artificial intelligence to conduct analysis may help strengthen the compliance practices of large and complex financial institutions, DNFBPs, and VASPs that could be exposed to a higher level of proliferation financing risks. This would enable them to identify linkages and relationships, build proliferation financing scenarios and recognise patterns (e.g. transaction times, value, purpose, counterparties, geolocation), which would be difficult to establish otherwise. As designated entities and individuals are increasingly using advanced deception techniques, including wire/payments stripping techniques to hide their true identities and conceal the beneficial owners, financial institutions, DNFBPs and VASPs should be vigilant to such risks and deploy appropriate tools to address such risks." Therefore, GeoComply respectfully recommends that the Federal Reserve incorporates FATF's recommendations into future CBDC frameworks pertaining to leveraging geolocation data to enhance AML/CFT, sanctions compliance, and digital identity to align with FATF's recommendations.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Privacy is at the heart of digital assets and decentralization. However, the use of these technologies to facilitate illicit financial activity such as money laundering or the financing of

terrorism has raised a deep concern for industry stakeholders and regulators. Geolocation data is a non-PII, unbiased data point that forms part of risk-based assessments, aiding institutions in identifying this kind of activity. By leveraging unique device intelligence, a user, and therefore their activity, is identifiable without the collection of PII. Other attributes such as their device characteristics and location biometrics (patterns, behaviors, etc) form part of the robust assessment to prevent illicit financial activity.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

In the last few years, both within the U.S. and across the globe, the financial sector has seen unprecedented technological adoption and advancement. Although this technological evolution has had positive impacts on the industry, it has also created accessible entry points for global cybercriminals and bad actors looking to exploit the U.S. financial system from anywhere in the world. Just as technology innovates and evolves, so do the tactics and attacks of cybercriminals, aiming to penetrate financial systems. One of the key factors enabling cybercriminals to perpetuate their crimes is their ability to manipulate or conceal their true location. Manipulating or hiding their true location is a bad actor's first line of defense, making it a clear red flag. Faking location anonymizes identity and hides intention.

Currently, most financial institutions rely on IP Addresses as part of their risk assessments and as a cyber indicator. However, based on our experience operating globally in the geolocation and fraud space, we know there are deficiencies associated with relying upon an IP address in isolation for geolocation, such as: spoofing and anonymizing of IP addresses via VPN, DNS proxy, and Tor Exit node; IP geolocation does not provide a high degree of accuracy and is rarely accurate to within a half of a mile; VPN's are dynamic and continually update themselves to avoid detection, and newly popular geolocation fraud technique uses hijacked residential IP addresses to enable users to mask themselves as an "undetectable" residential IP in a specific geographical territory. Distinguishing between multi-source geolocation data and an IP address is critical, as the use of accurate, authentic, and unaltered geolocation data is essential to establishing a person's true digital identity. Thus, incorporating multi-source, device-based geolocation data collection into onboarding, authentication, and transaction monitoring processes acts as a powerful deterrent to bad actors and facilitates the identification and prevention of suspicious activity in real-time. Not to mention, cybercriminals are moving beyond just manipulating their IP Address, they also use a myriad of location spoofing technology, such as fake locator apps, emulators, and virtual machines, in order to manipulate their geographical coordinates, making it essential to also verify the integrity of geolocation data. There are numerous benefits to utilizing geolocation data and spoofing detection solutions, such as: a) Facilitating more robust and reliable Know Your Customer (KYC) and CDD processes; b) Ensuring that suspicious activity can be monitored and prevented in real-time; c) Creating an audit trail for improved reporting and traceability of all transactions; d) Effectively geofencing high-risk and sanctioned nations; and e) Enhancing Anti-Money Laundering (AML)/Counter Financing of Terrorism (CFT)/Proliferation Financing (PF) compliance. Collecting and validating geolocation information would fill existing gaps in securing and monitoring digital asset transactions. GeoComply respectfully offers these recommendations with the aim to assist the Federal Reserve in its mission to ensure that individuals and organizations transacting with digital assets operate in a safe and sound manner and comply with applicable laws and regulations.

Furthermore, there is significant value that CBDCs could provide more broadly, particularly in instances where the government issues economic relief or stimulus funds. However, this is also a window for cybercriminals to take advantage of. It is critical to keep in mind the high rates of fraud associated with the rollout of a range of government-backed stimulus programs that led to significant losses of coveted taxpayer funds, while also impacting the lives of individuals who desperately needed those funds. Undoubtedly, there is an opportunity to leverage more reliable and accurate mechanisms to ensure that consumers can safely and securely receive essential funds. For example, many of the recent Covid relief and unemployment funds that were given were fraught with identity theft and individuals receiving unemployment benefits from multiple states, while residing in one state and utilizing one or a few devices. Consistent with FATF recommendations, advanced geolocation data can play a critical role in mitigating these threats. Accordingly, there is an opportunity to align the Federal Reserve's approach to CBDCs with FATF's recommendations on the collection and utilization of advanced location data and intelligence. CBDCs provide great promise in this area and there are a number of mechanisms that can be incorporated into CBDCs to ensure that an individual's digital identity is easier to affirm and accurately authenticated to prevent identity fraud schemes.

*14. Should a CBDC be legal tender?*

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Ripple would like to note some additional potential benefits and policy considerations for the Federal Reserve Board to consider in the design of a CBDC. **Micropayments:** We are supportive of the payments efficiency and resilience opportunities identified by the Federal Reserve Board in the Consultation Paper, including with respect to micropayments (p. 15). Ripple believes that an effective CBDC should allow for the processing of micropayments (i.e., payments made for very small amounts). Currently, the transaction costs associated with fiat micropayments are too high to support their execution. It is also important to note that since a CBDC is expected to substantially lower these frictional costs, the number of transactions (whether micropayments or not) is likely to be much higher than observed today, leading to greater demand. **Digital wallets:** We are supportive of the financial inclusion opportunities identified by the Federal Reserve Board in the Consultation Paper (p. 16). Additionally, one of the bigger drivers of financial inclusion over the past decade has been the rise of financial services from outside the banking sector, such as remittance providers and digital wallets. These services are pioneering new offerings and alternative experiences for traditional banking users. The issuance of a CBDC could occur in tandem with the creation of associated digital wallets that give consumers ownership of the digital currency and allow for a faster and more efficient method of distribution of money by the Federal Reserve. Digital wallets that enable payments, whether made domestically or cross-border, without requiring a bank account could succeed in promoting financial inclusion for the unbanked and underbanked populations, which may not be adequately served by the traditional banking system. While digital wallets could be used to enable peer-to-peer or wallet-to-wallet payments, infrastructure will need to be put in place to allow for the seamless transition from existing systems and must provide for, among other things, consumer protection, fraud prevention, and authentication and authorization. Moreover, because there are likely to be many different wallets to choose from, it is imperative that interoperability be taken into account to enable a seamless payment experience (for example, by allowing for consistent and effective authentication and authorization). **Tokenization of assets:** While not addressed directly in the Consultation paper, Ripple would also like to highlight the ability for a CBDC to extend the benefits of tokenization (i.e., the process by which an issuer creates digital tokens on the blockchain which represent ownership of physical or digital assets) to the general public. This can be achieved by allowing the private sector to develop on the ledger established for the CBDC, to create new opportunities for tokenization. Examples include protecting property rights for tangible property (such as real estate, art, and collectibles) as well as intangible assets (digital rights) via non-fungible tokens. **Optimizing supply chain workflows:** Finally, the CBDC workflow being explored can help support supply chain efficiencies through the escrow of funds and payment of invoices. **Decentralized exchanges (DEXs):** can ease friction in cross-border commercial payments by allowing the payor to choose the currencies they have, and the payee to choose the currencies they want to hold. **Public education:** A key consideration when rolling out a CBDC is getting citizens to use it. In talking with central banks, public education initiatives have been critical for success in digital payment systems implementations. Those most in need of education can be the hardest to reach. "Teach the teacher" plans can be effective in allowing the public to be educated by trusted parties, such as community groups or family members. **Auditable integrity:** Traditional digital payments typically have separate processes for: **Instruction** The exchange of information related to the movement of value **Clearing** The agreement between counterparties that a movement of value has occurred / or will occur with certainty

**Settlement** The updating of the system of record accounts to affect a movement of value between parties. Currently these processes are connected through the use of data references and typically dependent on record matching of intermediaries. They can be effectively collapsed for CBDC based on blockchain technology. The agreement in the application of a movement of value is unequivocally based on the transaction validity and provable outcome which can be matched back to instruction details using a cryptographic audit trail.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Of the people who do have bank accounts, many remain underserved and unable to access the full range of basic financial services, such as savings, loans, mortgages and other forms of credit. In the United States, for example, about 14 million people are unbanked, and 50 million are underbanked

(<https://www.atlanticcouncil.org/blogs/geotech-cues/central-bank-digital-currency-can-contribute-to-financial-inclusion-but-cannot-solve-its-root-causes/>). Two-thirds of those unbanked adults also own a mobile phone, an important prerequisite for an effective CBDC rollout ([https://globalfinindex.worldbank.org/sites/globalfinindex/files/2018-04/2017%20Finindex%20full%20report\\_0.pdf](https://globalfinindex.worldbank.org/sites/globalfinindex/files/2018-04/2017%20Finindex%20full%20report_0.pdf)). Those households suffer from a wide array of challenges inherent in the current structure of the financial ecosystem, including difficulties establishing credit history, accessing basic financial services such as peer-to-peer (P2P) lending, and being able to send cross-border payments in an efficient and cost-effective manner. Ripple believes that a CBDC could assist in each of these three areas. Ability to Establish Credit History: Allowing un- and underbanked Americans access to a CBDC through their mobile phones could not only help establish a credit history, but a broader history with always-on access to resources regardless of physical location. P2P Lending: In many parts of the world, particularly those that are still heavily cash-reliant, something as simple as a P2P loan (e.g., loaning money to a friend or family member), could be made much faster, more efficient and secure with the use of a digital currency sent and received via a digital wallet. For many in today's current landscape, this simple act can take upwards of a full day (or more) to complete. Cross-Border Payments: Cross-border payments have historically been inefficient and expensive. A CBDC or digital-first solution, however, can lower the cost and time involved in making these payments. Across all of these use cases, however, there is a consistent set of practical hurdles to solve including, but not limited to, education, identity and offline access. Education: There is a global educational gap when it comes to understanding digital currencies. Onboarding people into a digital currency system who are unclear on how to use that system as well as the benefits of using it, will run the risk of low usage rates and/or financial inclusion. Improving the user experience or implementing a play-to-earn model that ensures people know how to use the app or digital wallet before they start handling real money and digital currencies could help ease people in, granting them further access and additional benefits as they go. Identity: Developed countries like the U.S. require a national identity to open a bank account, which poses inclusivity problems in and of itself. For citizens who do not have a family name, a passport, a driver's license or any other form of identification, this presents a seemingly insurmountable hurdle. With the use of a CBDC, those individuals would have the ability to be associated with a digital wallet, allowing them to meet basic Know Your Customer (KYC) requirements for identity verification. For example, in places where mobile phone usage is high but access to financial services is low, leveraging registered SIM cards and mobile phones as a way of proving identity for payments without a traditional ID number could help create a threshold to meet these requirements. Offline Access: CBDC platform design needs to consider offline access. Having internet access as a prerequisite to success may harm CBDC adoption and usage, both for those without regular access to the internet and for instances where unexpected power outages occur or devices run out of battery, for example; in the U.S., for example, currently 7% of Americans say they do not use the internet (<https://www.cnbc.com/2021/07/24/the-us-is-deciding-how-to-respond-to-chinas-digital-yuan.html>). With this in mind, CBDCs that provide alternate solutions—particularly those that do not require constant charging and can run without a direct power source or internet connection for consecutive days or weeks—and can accommodate offline scenarios will be critical to implementation. One example of how to solve for offline access could be a solution that mirrors the Indian e-RUPI, which leverages digital voucher mechanisms such as QR codes that can be printed offline and scanned to make retail purchases. This is one idea of many being piloted, and we believe even better solutions will surface. As overall CBDC adoption and usage continues to grow, it will be critical for central banks and governments to proactively think about how to enable offline access, built in by design. We have no doubt that as the technology underlying digital currencies and its many applications continue to expand and evolve, so too will our ability to understand and leverage these solutions to create a more inclusive financial system.

4. *How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*
5. *How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*
6. *Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Ripple believes that a CBDC has the potential to offer new opportunities for innovation in domestic and cross-border payments, which will also benefit commercial banks and payment services providers, resulting in a competitive and diverse financial system that ultimately benefits the end-user and consumer. This could increase the resilience of the system overall. However, the introduction of a CBDC could also lead to some structural changes that affect the functioning of the financial system. This will depend on a number of factors, including the level of adoption of the CBDC, the design of the CBDC, and attractiveness relative to deposits. A material shift from bank deposits to a CBDC might have an impact on bank lending and intermediation. However, these impacts may be limited if the system has time to adjust, and a two-tier system could mitigate any such risks. Ripple believes that a CBDC could, over time, increase the diversity of payment providers and other financial intermediaries. The introduction of a CBDC could make it easier for new financial service providers to enter the market for payments services, or for lending – increasing the diversity of financial service providers. This, in turn, could increase the resilience of the financial sector to shocks, and reduce the impact of financial crises overall.

7. *What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*
8. *If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*
9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*
10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*
11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*
12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Ripple believes that separation of concern is crucial to the privacy of any system. Unless a central bank has the remit - or desire - to see every transaction, all the information associated between participants in a CBDC payment should remain private. This is where messaging layers become important, in being able to share information and keep it off-ledger but at the same time allowing the participants to access the data to support processing, including for fraud and anti-money laundering (AML) checks. This information can then be made available to the relevant authorities as needed. Moreover, messaging layers mitigate a central bank's exposure in the event of an insolvency by a wholesale counterparty, whilst at the same time enabling traceability requirements. The Ripple CBDC platform enables the encryption of data such as personally identifiable information (PII), while still controlling access and double spend. The PII is not decrypted in order to prevent double spend or validate its authenticity. This decoupling of the message from the transaction data allows the central bank to preserve privacy while not affecting system performance. Sidechain technology similarly facilitates both scaling and system privacy. Large deployments might require industry, entity, or geographically distributed sidechains within a national CBDC platform. Sidechains provide a means for information to stay within the control of a trusted party. For example, a commercial bank could run a sidechain giving a citizen's trusted bank insight into their transactions, but not the central bank. At the same time sidechains help to scale the platform by providing an

independent network for verifying transactions. Any transaction that stays on the sidechain has no effect on the network performance of other chains while still maintaining a verifiable audit trail.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Public blockchains have set a new standard for operational and cyber resiliency. These systems hold over 1T US dollars of value in systems open to the world and maintain consistency across globally distributed operations. Implementing a private solution based on public blockchain technology adds additional security to an already secure solution. Taking this public system and making it private allows for the addition of non-traditional participants such as fintechs and telecommunication providers with controlled risk. The more participants that can gain access to the system, the greater the reach of the solution. Blockchain solutions move items such as high availability, disaster recovery, and load balancing from the infrastructure level to the application level. Rather than requiring an enterprise to maintain multiple geographically dispersed identical copies of a system, the organization need only run the servers and let the underlying protocol maintain system health.

*14. Should a CBDC be legal tender?*

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

This largely comes down to what the desired use case of the CBDC is (e.g., is it a direct cash replacement or an alternative to a traditional interest bearing bank account). If the CBDC is merely a representation of cash that can be used for P2P and C2B/B2B transactions, it may not make sense to have it be interest bearing. Whether a CBDC should be interest bearing will also be highly dependent on the amounts that are ultimately allowed to be held as CBDC. For example, if this is a low balance solution with limits on what can be held, then interest might not be appropriate.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Limits make sense when thinking about the barriers to entry/participation. If the intention is to lower barriers to entry, a limit might be appropriate if the end-user is only providing minimal information to open their account (e.g., cell number). Where an end-user provides more information to support KYC activities, it might enable a greater limit as the risk profile would be deemed lower. The question regarding quantity limits is also tied to the use case and purpose a CBDC would be created to support (see response to question 15). Finally, consideration should also be given to participants who are not native to this country. Do tourists need to be able to use a CBDC? If so, what level of KYC can be performed to enable their ability to hold and use a CBDC.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

To answer this question, the class of individuals allowed to hold CBDC and the level of information needed to support the participation must be established. Once these parameters are defined, intermediaries can be identified to support the validation and onboarding of individuals as well as the user experience. Whilst this has traditionally been regulated financial institutions, there is opportunity for other regulated entities to offer these services including, but not limited to fintechs and telecommunications providers. Failure to broaden the relevant pool of intermediaries beyond more traditional financial institutions could prove one of the key barriers to adoption in terms of making CBDC accessible.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Offline capabilities should be considered in a CBDC design (see question 3), but might not be required in early phases. Distributed blockchain solutions can meet the needs of partially offline payments, such as the sender or receiver being offline, by storing local copies of the ledger in a tamper proof environment or by supplying proof of payment. Both limits on time offline and spending can be enforced to reduce any exposed risk of counterfeit and double spend. A retail CBDC transaction can take place over intermittent or low bandwidth connections. In areas with no internet connectivity, agents can be used to provide access. Agents can also utilize trusted execution environments (TEE) to allow citizens access without compromising security. Finally, retailers can become agents, providing additional services to the community.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

If a CBDC is considered a direct cash replacement, the form factor/ease of use is critical (i.e., will individuals who suffer from an impairment be able to use it). If sections of the population are excluded from the design of the CBDC, this will significantly limit adoption and might create further exclusion from the financial system. Form factors serve as one of the biggest design considerations -- e.g., is this purely a smart phone based solution (if so, how does it leverage capabilities for individuals with sight or hearing impairments) or does it need to utilize another form factor such as a feature phone or physical card. While barriers to using physical cash are very low, a CBDC might be able to serve some needs that cash does not. For example, an individual with arthritis or impaired vision might not be able to count out cash, but could instead checkout from a store via palm print.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

The biggest design decisions involve the on and off ramps chosen, which intermediaries will allow CBDCs to be obtained, and which intermediaries will support the conversion to and from CBDC. All are fundamental to ensuring interoperability between existing payment platforms. These intermediaries will probably need access to the other payment platforms as well, which can be achieved through point of sale type devices (or other mechanisms) that orchestrate the transfer of CBDCs. The other key consideration is the amount / what information is required to allow for interoperability. If sending CBDC to a bank account, the process will need to support the entry of account information and have this passed as part of the CBDC transaction to allow it to be credited successfully. Similarly, if sending from a bank account to a CBDC account, the bank transaction will need to know about the destination account. To enable transferability, standards and common interfaces should be defined that ensure interoperability is simple, cost effective and consistent to allow various systems to work seamlessly.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

With the introduction of capabilities such as programmability, consideration needs to be given to who can leverage this functionality and for what purpose. For example, is this an open ended capability or should the ability to create this functionality be limited to institutions/organizations who meet a certain set of requirements? A policy and governance framework should be considered to protect the vulnerable and prevent exploitation.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

In working and talking with central banks globally, Ripple has seen the importance of examining the cultural significance of different payment instruments and how their replacement would affect citizens. Different nations' cultural relationship with cash bears this point out. In the United States, citizens are afforded a level of privacy when making cash payments. Fears that a CBDC may not provide the same level of privacy could prove a cultural barrier to its implementation. We can thus look at how cash is used and provide a workflow where low value, peer-to-peer payments can be made anonymously. Providing this workflow, which is not available currently, could bring acceptance and usage to the system.

By contrast, in the nation of Bhutan, cash is commonly used as a tribute to monks who provide blessings for life events such as weddings and births. This is a common practice and the central bank operates special cash exchange depots because it is considered disrespectful to give monks dirty or wrinkled bills. To ensure acceptance of a CBDC, we can work with community leaders (here, the monks), and provide a CBDC workflow for the tribute and blessing that is acceptable to all parties involved. This could also expose segments of the population to CBDC who would not otherwise be exposed via normal workflows. Ripple has worked with nations where P2P lending amongst family and friends is embedded in the culture. A pioneering use case for CBDC in these nations could be a system of social credit where Alice owes money to Bob and Bob owes money to Carol so Alice could pay Carol to satisfy both debts. Every nation and region has different relationships with cash and other payment instruments such as checks. These relationships can be examined not only for the friction they might create but for the opportunities they present to educate and inform the citizens.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The Discussion Paper raises most of the relevant issues, but some only in very general terms. Below are some of the issues that the IIF suggests merit further work and, where appropriate, further quantitative or qualitative assessment. Mitigants for identified risks, including financial disintermediation risk and systemic run risk, should be clearly identified and evaluated for their effectiveness and their effects on the financial system *ex ante*. Possible mitigants for the risk of financial disintermediation, and the heightened risk of systemic runs from bank deposits, that have been identified in the literature include:

- limits or holdings by single individuals, households, or corporations;
- tiered remuneration designed to render use of the CBDC as a store of value unattractive (relative to a means of payment);
- and • limits on transactions or accumulations within a particular time. There may also be merit in exploring whether and if so how the fractional banking model could operate upon customer-held CBDC balances operated by FDIC insured institutions. This would involve a range of implications and evaluation of whether changes to bank capital or liquidity regulation would be necessary. Any reduction in effectiveness of a CBDC in delivering the public policy objectives arising from such mitigants should be identified and evaluated in a quantitative and qualitative assessment undertaken by the Fed and/or other U.S. authorities. The Fed and other U.S. authorities should clarify their attitude toward the relevant mitigants and say which ones they would not consider, only consider as transitional or emergency measures, or consider as permanent features, and why. Mitigants should not open arbitrage opportunities between a CBDC and cash on the one hand, and a CBDC and commercial bank deposits on the other. In other words, they should preserve fungibility and “singleness” of the unit of account. Privacy controls need to be further articulated for any CBDC to proceed.
- It is not sufficient simply to delegate all privacy aspects to the intermediary layer. Any personally identifying information held by the operator(s) of the core CBDC infrastructure should be subject to a legally binding privacy regime.
- Privacy expectations should also be set for intermediaries in a legally binding and user-centric way which does not discriminate against regulated FIs or PSPs. Intermediaries should be allowed to access transactional data to provide value-added services, while complying with applicable data protection legislation.
- A particularly critical aspect to be tackled is the degree to which intermediaries would be permitted to earn remuneration by monetizing user data, and potential impacts on protecting consumer privacy. Explicit and well-informed user consent must be at the heart of any data monetization, as should maintaining the principle of “same business, same risks, same regulation” as between regulated FIs and PSPs on the one hand, and any other permitted wallet providers. Cyber security (resistance and resilience), particularly with regard to hostile state and state-sponsored actors, and operational resilience will both be fundamentally important. Any sustained outage of a retail CBDC system would be hugely disruptive, and possibly crippling, to the economy.<sup>1</sup> Costs of connecting to central infrastructure and funding for cybersecurity investments, and liability in case of cyber attack or AML/CFT risk, should be transparent and clarified *ex ante*.<sup>2</sup> Intermediaries should be regulated financial institutions (FIs) or payment service providers (PSPs) who are eligible to hold Federal Reserve master accounts. Further work on structuring, issuance and strategy for distribution with particular attention to access considerations and liability frameworks across the ecosystem will be necessary. The energy and climate footprint of any CBDC should be fully evaluated. Independent oversight of adherence of the CBDC system to applicable regulatory and technical standards would be an expectation of our members. An independent body could be set up to oversee compliance in this regard. Such a body would also usefully

cooperate with other global, regional or national bodies internationally with similar CBDC oversight responsibilities. The applicable standards should be based on appropriate models such as the CPMI-IOSCO Principles for Financial Market Infrastructures and be available to intermediaries to aid intermediaries with their own resilience planning. 1. In this regard, we note with concern that the Eastern Caribbean CBDC system went offline on January 14, 2022 and was still offline six weeks later, as reported in Forbes magazine on February 28. 2. As used in this submission, the term “AML/CFT” (anti-money laundering and countering the financing of terrorism) includes countering financial crime or financial crime risks, and also screening for politically exposed persons (PEPs) and sanctioned individuals/entities.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Other means may be as effective, or more effective, than a CBDC in delivering some of the potential benefits identified of a CBDC. For example (taking the

“potential benefits” identified by the Fed as a proxy for a U.S. CBDC’s public policy objectives):

- Safely meet future needs and demands for payment services: oThe private sector in partnership with the Fed already delivers a range of high-quality, cost-effective payment services to U.S. residents and businesses. oDirect payments to billers and peers by electronic commercial bank money are fast, efficient and reliable. Most FIs offer a degree of programmability with scheduled and recurring payments. oExisting initiatives such as the Clearing House’s RTP service and FedNow, scheduled to debut in 2023, will improve the existing performance of the payments system over time. oAs the President’s Working Group (PWG) et al. November 2021 report on stablecoins and the Discussion Paper have noted, well-designed and appropriately regulated stablecoins might potentially support fast, efficient, and inclusive payment options, though more research is needed to verify this. oA wholesale CBDC, i.e., a digital liability of the central bank that is not widely available to the general public, would be another, and possibly less risky, means to provide a platform for payment innovation than a retail CBDC.
- Improvements to Cross-Border Payments: oThere are other more immediate means to improve the speed, cost, transparency and accessibility of cross-border retail payments than a retail CBDC. Of course, most of the building blocks of the G20’s cross-border payments roadmap, which the IIF is helping to take forward, are not currently predicated on a retail CBDC. oAs the Fed acknowledges, however, realizing potential improvements through a CBDC would require significant international coordination to address issues such as common standards and infrastructure.

- oThe most salient alternative measures include:
  - Linking domestic faster payment systems together on a cross-border basis, such as is occurring bilaterally in South-East Asia, and could take place multilaterally through projects such as the BIS Innovation Hub’s Project Nexus. This could involve the activation of One-Leg-Out instant payment schemes with higher payment limits to increase the scope of such schemes to cover business payments.
  - Addressing data barriers that arise from regulatory fragmentation (e.g., in implementation of KYC and AML/CFT rules) or inconsistent implementation of international payment message standards and the data required to be included within payment messages, including the potential for PSPs to interpret domestic requirements on an individual basis.

- 1·Support the USD’s International Role oThe question whether CBDC would support the USD’s international role is a complex one. oOn the one hand, a retail CBDC is neither sufficient nor likely necessary for reserve currency status.

In our view, the key drivers of reserve currency status are not likely to be availability of a retail CBDC but rather the rule of law, monetary and financial stability, and full convertibility.

- Financial Inclusion: oAs the House of Lords report on a U.K. CBDC concluded, it is likely that there are more straightforward and targeted ways to support access to financial services than to launch a CBDC.

- oOne way is to tackle the problem of the unbanked in more direct ways, such as by extending low-cost basic account services, including through public subsidies or tax incentives where necessary. In the US, certified Bank On accounts have been successful to date and should remain a core component of efforts to reduce un-/under-banked populations.

- oInside and outside the regulated banking sector, there are an increasing number of PSPs providing private digital wallets or mobile payment solutions including to “unbanked” customers. Removing unnecessary regulatory barriers to entry to these services, including through State-based mutual recognition schemes, would help.

- oThe encouragement (through chartering reforms) of low-cost, digital-only banks can help reach those consumers who are digitally literate but cost sensitive, would also assist.

- oAnother means would be to increase the level of digital financial inclusion by improving internet broadband services, and access to simpler, more accessible devices for the elderly, visually impaired or those with other

disabilities. ·Extend Public Access to Safe Central Bank Money: offering the public access to commercial bank money via unquestionably strong, well-regulated FIs, backed with solid deposit insurance, continues to be an obvious alternative means of providing access to safe money, albeit not a central bank liability. 1. See further IIF (2022), Response to FSB request for written feedback on data frameworks affecting cross-border payments, 14 January. 2. House of Lords (2022), CBDCs – A solution in search of a problem, at para. 5.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Overall, the IIF is sceptical that a retail U.S. CBDC itself would materially improve financial inclusion. Rather, a neutral effect appears more likely. A CBDC would neither be sufficient nor necessary to drive higher rates of financial inclusion. On lack of sufficiency, other more important drivers of financial inclusion include: financial literacy; digital literacy and measures to address the “digital divide”; access to secure identity (digital or otherwise); and sufficient savings or earnings to make engaging with the formal financial system worthwhile. See our response to question 2 for further detail. To illustrate the lack of necessity, measures of financial inclusion have risen sharply in Latin America in recent times, partly in response to the choices made by governments in delivering pandemic relief. Prior to the pandemic, an average of only 55% of Latin American adults had an account at an FI.1 COVID-19 related social benefits programs, including pandemic relief payments to bank accounts, through payment apps and to private digital wallets, helped financially integrate more than 40 million people in Brazil, Colombia, and Argentina alone. Brazil reduced its unbanked population by 73%, while Colombia and Argentina also made reductions of 8% and 18% respectively. If similar programs in Chile, Peru, and Uruguay had a similar effect, it is estimated that the unbanked population in all of Latin America will have been reduced by 25% due to the impact of COVID-19 social benefit programs alone.2 Further, a recent report suggests that the fact that many Americans are currently unbanked would not simply be resolved by introducing a U.S. CBDC, as distrust of the banking system is among the main reasons for financial exclusion.3 1.Mastercard and Americas Market Intelligence (AMI) (2020) Financial Inclusion during COVID, October, citing the World Bank. 2.Mastercard and AMI (2020), op cit. Figures measured as at August 2020 relative to pre-pandemic levels. As cited in IIF (2022), Cloud in Latin America: Opportunities and Challenges for Financial Services, 28 February (IIF members only). 3.Maiden and MIT Digital Currency Initiative (2021), The Future of Our Money: Centering Users in the Design of Digital Currency, December 16.

*4. How might a U.S. CBDC affect the Federal Reserve’s ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

The answer to this question is highly sensitive to the choice of mitigants for financial stability risks (chiefly, disintermediation risk and systemic run risk) that may be exacerbated (in probability or impact) by a displacement of bank deposits by retail CBDC holdings. See our answer to question 7 below on possible mitigants for these risks. Any mitigants involving non-zero remuneration on CBDC balances (positive or negative) would likely confer on the central bank a proliferation of new policy tools that may unduly complicate the conduct of monetary policy, or on the other hand, provide the Fed greater flexibility in crisis scenarios. There could arise at least 4 different policy rates for which the central bank would be responsible: • the federal funds target rate; • the remuneration rate on “payments” or small holdings of retail CBDC; • the remuneration rate on “store of value” or larger holdings of retail CBDC; • the remuneration rate on wholesale CBDC. The complicated signaling effects from having so many interacting policy levers may be undesirable.1 On the other hand, a fixed policy that CBDC balances must be zero remunerated clearly strengthens the zero lower bound to monetary policy. This effect would be attenuated to the extent that it did not apply to wholesale CBDC, but this could “break” par between the retail and wholesale instruments, driving significant arbitrage. 1.As to signalling effects, see Panetta et al, (2021) Central Bank Digital Currency: functional scope, pricing and controls, ECB Occasional Paper 286, p. 13.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

The economic literature around CBDC, disintermediation and financial stability suggests a CBDC could negatively affect financial stability. Systemic run riskAs the BIS and a group of central banks including the Fed have found, CBDC and certain new forms of digital money could increase the latent risk of systemic bank runs, where depositors may seek to run from bank deposits to CBDC across all or many banks.1A period of rapid substitution from deposits to CBDC would be equivalent to a run on the banking system. The cost and frictions of running to CBDC would likely be much lower than running to cash.2Importantly, the lower costs of running to CBDC compared to cash imply that more depositors would quickly withdraw at a lower perceived probability of a system-wide bank solvency

crisis.<sup>3</sup> In addition to the potential impact of CBDC in benign conditions, during crisis periods a CBDC could be perceived as a safe haven making bank deposits, particularly uninsured deposits, more flighty and thus increasing the risk of bank runs.<sup>4</sup> Depending on the context, the shift in deposits could be large in times of stress.<sup>5</sup> Effects of possible mitigants to systemic run risk Possible mitigants for the risk of financial disintermediation, and the heightened risk of systemic runs from bank deposits, that have been identified in the literature include: •limits on holdings by single individuals, households, or corporations or “end users”; •tiered remuneration designed to render use of the CBDC as a store of value unattractive (relative to a means of payment); •limits on transactions or accumulations within a particular time; and •crisis measures such as limits or controlling fund outflows from bank deposits. More research and analysis is needed on the viability of limits, and the trade-offs between limiting the speed of possible bank runs to CBDC and reducing the usefulness of CBDC in normal times.<sup>6</sup> This observation applies to tiered remuneration and other mitigants as well. Changing the interest rate charged on CBDC balances in times of stress or crisis, even if the tool were available, would be unlikely to reduce systemic run risk given that savers fearing a loss of all their savings may not be price sensitive to interest charges over relatively short periods.<sup>7</sup> Any attempt to introduce holding or transaction limits or tiered pricing may either reduce the appeal of a retail CBDC significantly, or open a pricing basis or spread between it and cash on the one hand and commercial bank money on the other, thus fragmenting the ‘singleness’ of the currency as a unit of account. The cross-border and global dimensions of CBDCs available to non-residents could be especially pronounced during times of generalised flight to safety. If CBDCs accelerated flights from risk, deleveraging pressures could manifest themselves in the form of tight funding conditions and sharp movements in foreign exchange markets.<sup>8</sup> Systemic risks arising from increased funding costs Introduction of a retail CBDC would increase bank lending interest rates and reduce bank strength, as detailed in our answer to question 6. Reduced bank net interest income, as well as its constraining effect on lending to the real economy, including through mortgage and SME lending, can be expected to weaken financial stability if it impairs the ability of FIs to raise capital to meet prudential capital requirements, including in times of stress. <sup>1</sup>BIS and Group of Central Banks (2021), Central bank digital currencies: Financial stability implications, September, p. 2.<sup>2</sup>Bank of England (2020), Central Bank Digital Currency: opportunities, challenges and design, 22 March, p. 38<sup>3</sup>BIS and Group of Central Banks (2021), Central bank digital currencies: Financial stability implications, p. 9, citing Broadbent (2016) and Callesen (2017).<sup>4</sup>BIS and Group of Central Banks (2021), *Ibid.*, p. 13.<sup>5</sup>BIS and Group of Central Banks (2020), Central bank digital currencies: foundational principles and core features, 9 October. A crucial element in such system-wide shifts is the stronger sensitivity of depositors to the actions of others. The more other depositors run from weaker banks, the greater the incentive to run oneself. It would be difficult to stem runs under such conditions, even when providing large lender of last resort facilities: *ibid.*<sup>6</sup>Bank of England (2020), Central Bank Digital Currency: opportunities, challenges and design, 22 March, p. 38<sup>7</sup>BIS and Group of Central Banks (2021), Central bank digital currencies: Financial stability implications, p. 17.<sup>8</sup>BIS and Group of Central Banks (2021), *Op. cit.*, p. 18.

#### *6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

A retail CBDC could adversely affect the financial sector through a reduction of funding that would translate into a reduced availability of credit and an increase in lending costs to the real economy (including of mortgage and SME lending), with business model implications for FIs. Studies suggest there would be substitution away from retail bank deposits to CBDC in normal times, as end users take advantage of the low credit risk associated with CBDC. Estimates of this effect vary considerably, but one study estimates that up to 55% of commercial bank deposits could be diverted.<sup>1</sup> This can be expected to significantly increase funding costs for banks wishing to keep lending at the same level, as they would need to raise the rate of interest on deposits considerably or source more expensive wholesale funding in order to do so. This would in turn substantially impede banks’ ability to create credit for the broader economy, including through mortgage and SME lending. It can also be expected to generate strong incentives to considerably increase the role of the Fed in credit creation by deploying CBDC reserves to acquire bonds or provide other forms of wholesale funding. While central banks can in principle also be a source of alternative funding, such funding – whether temporary or structural – may need to be provided against lower quality collateral as only that would increase HQLA for banks.<sup>2</sup> We would suggest that a situation in which the Fed has an ever-greater role in the provision of credit because CBDC crowds out bank lending is inconsistent with market economy principles. According to quantitative modelling by the BIS and a group of central banks including the Fed, bank return on equity (RoE) would be negatively affected monotonically with both the substitution effect and the wholesale:deposit spread, such that at a 25% outflow from deposits to CBDC, with a 2% pts spread, RoE would decline by 0.9% pts.<sup>3</sup> The same study also found there would need to be a significant increase in the banking sector lending rate to maintain net interest income, such that at a 25% outflow, with a 2% pts wholesale to deposit spread, lending rates would increase by 0.7% pts.<sup>4</sup> The possibility that banks could try to offset the higher cost of funding by engaging in riskier forms of lending could in turn create financial stability risks.<sup>5</sup> Reduced

bank net interest income, as well as its constraining effect on lending to the real economy, could be expected to weaken financial stability if it were to impair the ability of FIs to raise capital to meet prudential capital requirements, including in times of stress. 1One study has found that households could be expected to hold from 4% to 55% of their combined cash and deposit holdings in a CBDC, depending on whether the CBDC had more 'cash like' features or whether it was more competitive with bank deposits. See Li (2021), Swiss National Bank, 'Predicting the Demand for Central Bank Digital Currency: A Structural Analysis with Survey Data', 18 November. 2BIS and Group of Central Banks (2021), Central bank digital currencies: Financial stability implications, p. 10, 3BIS and Group of Central Banks (2021), Central bank digital currencies: Financial stability implications, p. 9, Graph 3. 4Ibid. 5CPMI and Markets Committee (2018), Central bank digital currencies, p. 16, cited in BIS and Group of Central Banks, Central bank digital currencies: foundational principles and core features, 9 October and in turn in House of Lords (2022), CBDCs - A solution in search of a problem, at n. 115.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Possible mitigants for the risk of financial disintermediation, and the heightened risk of systemic runs from bank deposits to retail CBDC, that have been identified in the literature include:

- limits on holdings, or limits on transactions or accumulations within a particular time, by single individuals, households, or corporations;
- tiered or no remuneration designed to render use of the CBDC as a store of value unattractive (relative to a means of payment);
- providing alternative sources of funding to compensate commercial banks for the loss of bank deposit funding; and
- crisis measures such as limits or controlling fund outflows from bank deposits.

All of these mitigants introduce complications which may render them unusable or ineffective, or reduce trust in the integrity of the system if there is wide-scale abuse:

- Limits on individual holdings, and tiering of remuneration above certain limits, require either a secure national or digital identity scheme, both for individuals and corporations, or a certain, high tolerance for duplicate accounts being created through multiple intermediaries.
- Access by corporations to a retail CBDC would also introduce the ability for individuals to 'hide' CBDC wallets inside corporations. Such corporations could be sold on the secondary market. Aggregating holdings across these corporations would be extremely difficult.
- Any inability to aggregate limits over individuals' multiple or corporate holdings could diminish trust in the integrity of the system and in the central bank, and may undermine AML/CFT efforts.
- Once a retail CBDC exists, political pressure to make it competitive with commercial bank deposits on inclusion and other grounds may lead to the relaxation of holding limits and increases in interest rates paid.
- More generally, assuming trusts over CBDC wallets are recognized by law, limits on individual holdings could be rendered ineffective unless details of trust holdings are registered. Transaction limits could be considered to reduce systemic bank runs, including in a crisis. They may however also open wide basis between the retail CBDC and cash, or the CBDC and commercial bank money (or other instruments such as stablecoins) in a crisis. There may also be merit in exploring whether and if so how the fractional banking model could operate upon customer-held CBDC balances operated by FDIC insured institutions. This would involve a range of implications and evaluation of whether changes to bank capital or liquidity regulation would be necessary. If viable, this could be a mitigant to bank deposit disintermediation risk, but not a complete solution.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

We would suggest the central bank has a role to play in ensuring the ongoing availability of cash for several reasons, including resilience, the existence of a digital divide, and a lack of financial education within a significant part of the population that is unlikely to be resolved by issuance of a retail CBDC (and may even be exacerbated). That said, if the use of cash does otherwise decline significantly, it may be necessary to provide an alternative (in the form of a retail CBDC) to citizens to preserve the monetary anchor. It is unclear, however, to what extent the use of cash would have to be reduced before this monetary anchor would be endangered.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

As for the domestic payments agenda, the Discussion Paper usefully summarizes some of the key developments, including RTP and FedNow. We note ongoing consideration of the possibility of extending RTGS operating hours, by CPMI and others.<sup>1</sup> In the absence of a CBDC, efforts can be expected to continue to be made to regulate stablecoins, either through regulatory guidance or through actions by the Congress.<sup>2</sup> We would also expect FIs and PSPs to continue to innovate and prepare themselves for more digital and integrated

payments and settlement systems. We note in this regard the recommendations of the recent report of the PWG and other agencies on stablecoins. Adequate regulation and additional research will be essential in order to consider the viability of these instruments as long-term options for cross-border digital payments.<sup>3</sup> Cross-border payments are of course a key priority for the G20 through its 2020 cross-border payments roadmap, to which the IIF has contributed through comment letters, by co-convening the Global Payments Forum, and by establishing a formal task force. We fully support the objectives of the roadmap, while we would suggest adjustments in aspects of its implementation, and are committed to working with our members and the official sector on its implementation. Most of the building blocks in the roadmap could be accomplished independently of the establishment of CBDC. We are confident that the goals of the roadmap could be accomplished without a retail U.S. CBDC. Separately, private sector and public-private initiatives that have helped and will continue to help improve cross-border payments around speed, cost, transparency and accessibility include:

- SWIFT gpi, a new initiative developed to improve the experience of making a payment via the SWIFT network for both customers and banks. SWIFT gpi combines the traditional SWIFT messaging and banking system with a new set of rules.
- SWIFT GO, a service whereby FIs can enable their SME and retail customers to send predictable, fast, highly secure, and competitively priced low-value cross-border payments anywhere in the world, direct from their bank accounts.
- The continuing roll-out of ISO 20022, including ongoing efforts to improve the alignment of implementation.
- Initiatives to directly connect faster payments schemes, both bilaterally (such as the recent Singapore–Thailand link) and multilaterally (such as the coming Singapore–Thailand–Malaysia link), and the work of BIS Innovation Hub's Project Nexus.
- Initiatives to introduce digital identity schemes and digital verifiable credentials schemes domestically and across borders, such as the IIF's Open Digital Trust Initiative and the Global Assured Identity Network proof of concept.
- The advent of increasing competition from Paytechs in the cross-border payments space, including those exploiting a multilateral netting model.
- Well-regulated stablecoins, pending an assessment of their impacts on credit formation and financial stability.

1See the IIF's submission to CPMI dated January 14, 2022, in which we observed that there would be considerable cost and risk associated with moving to 24/7 operation of RTGS systems. 2See e.g. Brunnermeier et al. (2021), The digitalization of money, BIS Working Papers No 941 3PWG, FDIC and OCC (2021), Report on Stablecoins, November

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The U.S. should extract lessons learned from what the central banks of other large economies do, including the EU, and consider the geopolitical and interoperability implications of their actions, including in relation to cross-border payments. However, those experiences may have limited relevance to the U.S. economy, given the USD's unique role in the global economy as the reserve currency and should not, in and of themselves, determine U.S. action. The experience of small countries, including on cyber issues, will also be instructive. Retail CBDC is neither sufficient nor likely necessary for reserve currency status. In our view, the key drivers of reserve currency status are not likely to be availability of a retail CBDC but rather the rule of law, monetary and financial stability, and full convertibility. Digital networks may drive “digital dollarization” even if they permit users outside the U.S. to hold only e-money or commercial bank money representations of USD or stablecoins, and not CBDC.<sup>1</sup> That said, wide availability of a retail U.S. CBDC, together with its availability to non-residents, may drive some invoicing to be denominated in USD that is not already. There may also be intangible perception effects associated with the non-issuance of a retail CBDC in circumstances where other competing economies have done so. The USD and supporting payment networks should continue to interoperate with currencies of major economies. Should major economies develop a CBDC system that would not otherwise be interoperable with existing U.S. payment systems or USD-denominated stablecoins, the Fed may wish to consider the implications and risks associated with being unable to participate in such a system. This should not, however, drive the U.S. to prematurely adopt CBDC. 1For the concept of “digital dollarization”, see Brunnermeier et al. (2021), The digitalization of money, BIS Working Papers No 941

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Possible mitigants for the risk of financial disintermediation, and the heightened risk of systemic runs from bank deposits to retail CBDC, that have been identified in the literature are set out in our answer to question 5. Additionally, authorities could impose a “systemic run tax” or “haircut” on CBDC transactions during times of crisis to disincentivise runs into the CBDC. However, this could be unpopular and may open a basis between bank deposits and CBDC during a crisis.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

The Bank of England has suggested a “platform model” whereby: • A CBDC payment system would need to be compliant with AML/CFT regulations and requirements. This means the identity of CBDC users would need to be known to at least some authority or institution in the wider CBDC network that can validate the legitimacy of their transaction. • In the platform model, one possibility is that the core ledger only stores pseudonymous accounts and balances, but that each account in the core ledger is linked to a Payment Interface Provider (PIP) who knows the identity of each user. • PIPs would be responsible for applying AML/CFT checks to users, and for reporting suspicious transactions to the authorities. • This arrangement means that the Bank would not hold granular personal data on any user, reducing the privacy concerns that could arise in connection with holding personal user data, but AML/CFT requirements could still be met by the CBDC system as a whole. AML/CFT responsibilities could be handled entirely by the PIPs.<sup>1</sup> We consider that the Bank of England ‘platform’ model with pseudonymity could be a useful model for the Fed to investigate further. However, payments data plays an essential role in the provision of financial services, e.g., to analyze risks better and provide credit more accurately and at a better price. Payments data is also a core element of offering improved personalized solutions. Many potential value-added services will rely on access to and use of this data. Therefore, it is important that the central bank’s focus on privacy does not translate into a general restriction on the use of data from CBDC transactions. Intermediaries should be allowed to access transactional data to provide value-added services, while complying with applicable data protection legislation. CBDC design should ensure that data is used in a responsible way, ensuring both security and privacy. The Fed paper states that a general-purpose CBDC would generate data about users’ financial transactions in the same ways that commercial bank and nonbank money generates such data today, and that in the intermediated CBDC model that the Federal Reserve would consider, intermediaries would address privacy concerns by leveraging existing tools. Privacy controls need to be further articulated for any CBDC to proceed. • It is not sufficient simply to delegate all privacy aspects to the intermediary layer. Any personally identifying information held by the operator(s) of the core CBDC infrastructure should be subject to a legally binding privacy regime. For example, restrictions on individual or corporate holdings, assuming multiple intermediaries, or applying to offline capability, would seem to require at least pseudonymity at the level of the core ledger. • Privacy expectations should also be set for intermediaries in a legally binding and user-centric way which does not discriminate against regulated FIs or PSPs. At the same time, payments data plays an essential role in the provision of financial services, e.g., to analyze risks better and provide credit more accurately and at a better price. Intermediaries should therefore be allowed to access transactional data to provide value-added services, while complying with applicable data protection legislation. • A particularly critical aspect to be tackled is the degree to which intermediaries would be permitted to earn remuneration by monetizing user data, and potential impacts on protecting consumer privacy. Explicit and well-informed user consent must be at the heart of any data monetization, as should maintaining the principle of “same business, same risks, same regulation” as between regulated FIs and PSPs on the one hand, and any other permitted wallet providers (including BigTech providers) on the other. 1Bank of England (2020), Central Bank Digital Currency: opportunities, challenges and design, 22 March, p. 31

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Cyber security (resistance and resilience), particularly with regard to hostile state and state-sponsored actors, and operational resilience will both be fundamentally important. While cyber risk is unavoidable, the impact of a hostile state actor attack on the core ledger of, or major wallet providers to, a U.S. CBDC cannot be overstated. Any sustained outage of a retail CBDC system would be hugely disruptive, and possibly crippling, to the U.S. and global economy. In this regard, we note with concern that the Eastern Caribbean CBDC system went offline on January 14, 2022 and was still offline six weeks later, as reported in Forbes magazine on February 28. • Each bank in the Federal Reserve System could be an issuer of CBDC and a validator of transactions, for example. • Another mitigant could be to provide for segregation of systems operating any retail CBDC from those operating any wholesale CBDC. This would provide for the continued availability of commercial bank money even if the retail CBDC were offline. For resilience reasons during natural disasters or major incidents, offline capability of any CBDC would appear to be essential. AML/CFT and financial crime risks must be mitigated, likely through holdings limits, either at the individual or device level. Independent oversight of adherence of the CBDC system to applicable regulatory and technical standards would be an expectation of our members. An independent body could be set up to oversee compliance in this regard; for instance, an inspectorate, reporting directly to the Board of Governors, and independent of the operation and planning of the CBDC system,

could be established to ensure operational resilience of the system. Such a body would also usefully cooperate with other global, regional or national bodies internationally with similar CBDC oversight responsibilities.

*14. Should a CBDC be legal tender?*

Yes, any retail U.S. CBDC should be legal tender to avoid opening up an undesirable basis and differentiation between it and its cash and commercial deposit representations of the currency, with resulting fragmentation risk and loss of fungibility.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

We are conscious that a CBDC could confer on the central bank a proliferation of new policy tools that may complicate the conduct of monetary policy. The IIF also acknowledges, however, that it may provide the central bank additional avenues of flexibility during crises. That said, interest being payable on CBDC by the central bank would strongly add to such complication. The IIF finds this unfavorable. The BIS study results earlier cited about bank net interest earnings and lending rates are quite sensitive to the spread between wholesale and deposit rates.<sup>1</sup> Further, substitution effects are very sensitive to the characteristics of the CBDC, including the extent to which it replicates cash (and is zero coupon) or replicates bank deposits.<sup>2</sup> As such, we would advocate that retail CBDC not be remunerated at a rate above zero. An interest-bearing CBDC, as well as potentially increasing systemic risk, could also raise issues as to fungibility with cash and commercial bank money and could create legal and fragmentation risks. Wholesale CBDC is subject to different financial stability considerations, so remuneration of that asset would be subject to a different range of considerations. As a starting point, any wholesale CBDC should be remunerated at the same rate as commercial bank reserves. As to the lower bound of retail CBDC remuneration, in times of negative or near-negative interest rates, considerations around the zero lower bound and the stability of the bank deposit base would suggest that negative interest rates should apply to CBDC and be applied to retail holdings at a level intended to dissuade large-scale substitution into CBDC. However, negative interest rates may lack public acceptance and may create political issues for the central bank. There may also be concerns about fungibility if a retail CBDC can be programmed to have negative interest rates. <sup>1</sup>BIS and Group of Central Banks (2021), op. cit. <sup>2</sup>Li (2021), Swiss National Bank, 'Predicting the Demand for Central Bank Digital Currency: A Structural Analysis with Survey Data', 18 November.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

As stated in our answer to question 7, any tiering of remuneration in such a manner as to incentivize use of a CBDC as a means of payment, and not as a store of value, would introduce added complications, which may render limits unusable or ineffective, or reduce trust in the integrity of the system if there is wide-scale abuse. Limits on individual holdings, or periodic limits on transactions or accumulations, and tiering of remuneration above certain limits, require either a secure national or digital identity scheme, both for individuals and corporations, or a certain, high tolerance for duplicate accounts being created or operated through multiple intermediaries. Access by corporations to a retail CBDC would also introduce the ability for individuals to 'hide' CBDC wallets inside corporations. Such corporations could be sold on the secondary market. Aggregating holdings across these corporations would be extremely difficult. Any inability to aggregate limits over individuals' multiple or corporate holdings could diminish trust in the integrity of the system and in the central bank.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Except as provided below, regulated FIs and PSPs that are eligible to hold Fed master accounts should be the only firms qualified to serve as intermediaries for CBDC. Non-resident firms could be permitted to qualify, so long as they qualify under the above. Consideration could also be given to permitting equivalently regulated firms, so long as they conform with relevant requirements such as appointing local agents, submitting to local jurisdiction, maintaining a local responsible officer, undertaking basic reporting, etc. This implies that, at least insofar as they are custodians of CBDC, they could be permitted to hold retail CBDC offshore. The privilege of being an intermediary for a U.S. CBDC should be limited to institutions that operate within robust regulatory and supervisory frameworks in the following areas: • safety and soundness; • fiduciary operations; • AML/CFT; • tax withholding and reporting; • risk-based capital requirements; • personal/consumer data privacy; • cybersecurity (resistance and resilience); and • operational resiliency. Intermediaries that perform services for end users and incur the costs and liability involved (e.g., for hacking, AML/CFT or operational errors) will need to be compensated for taking on these risks to make the business model feasible for a U.S. CBDC.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

For resilience reasons during natural disasters or major incidents, an offline capability of any CBDC would appear to be essential. This could be achieved, for example, through a stored value card with merchant readers, or through a mobile phone application with an NFC peer-to-peer capability. AML/CFT risks must be mitigated, likely through holdings limits, either at the individual or device level. However, our observations in our answer to question 7 above about the issues with individual holding limits apply. One possible specific mitigant (beyond an individual holding limit) would be to limit the wallet size for offline capability to one wallet per individual mobile number. That way, some AML/CFT information would be available at the mobile operator, which would presumably be shared with the intermediary at time of "charging" of the offline wallet. The cost of new offline wallets could be quite high to dissuade trafficking of wallets, at the expense of deterring tourists from using the offline CBDC.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Costs of connecting to central infrastructure and funding cybersecurity investments, and liability in case of cyber attack or AML/CFT risk, should be transparent and clarified *ex ante*. Intermediaries should be regulated FIs or PSPs that qualify for access to Fed master accounts, subject to effective oversight. We would observe that pricing a CBDC at below cost may risk crowding out other private sector payment methods. Intermediaries would, over time be expected to design features that render a CBDC attractive to retail users. Some of these features may include programmability, multi-asset wallets, tokenization features, and peer-to-peer payment capabilities.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

The G7, including the U.S., have said that "CBDCs should coexist with existing means of payment and should operate in an open, secure, resilient, transparent and competitive environment that promotes choice and diversity in payment options."<sup>1</sup> This principle of coexistence is a "must have" and any U.S. CBDC design should deliver on this requirement.

We note that the BIS, through projects such as Project Dunbar, is actively investigating technical means of ensuring connectivity between CBDC platforms. We would note that technical means of interoperation are not the same as agreement on the governance layer which would need to sit at the top of any such system. Such a governance layer, which would likely consist of agreements or understandings, as well as protocols, among system operators, would seem to need to be robust to growing geopolitical stresses, including the possibility of war among member states. It is likely that the central bank would need to promulgate technical standards to which the intermediaries would be expected to adhere, as well as to maintain and publish all APIs and data schemata needed by the system as a whole. Interoperability of CBDC internationally would further require development of a broader Common Domain Model or similar data architecture, building on the ISO 20022 standard, so that similar concepts in particular CBDCs could be readily mapped and translated (where not identically expressed). <sup>1</sup>Group of Seven (G7) (2021), G7\_Public\_Policy\_Principles\_for\_Retail\_CBDC, 14 October.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Any CBDC system will need to be adaptable to emerging security threats and technological change, including fast-developing quantum computing.<sup>1</sup> The Fed will need to keep aware of design choices by other economies pursuing CBDCs and consider the extent to which they could positively or negatively impact the interoperability of its own design choices, should it pursue a U.S. CBDC. <sup>1</sup>House of Lords (2022), CBDCs - A solution in search of a problem, p. 5.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

In our view, the main tradeoff is between financial stability and usability of the CBDC. As discussed, many mitigants to financial stability risk breaking the "singleness" of the CBDC and opening basis with cash on the one hand and with private money such as commercial bank deposits and stablecoins on the other. The International Monetary Fund (IMF) has also identified in its report on CBDC that there is a potential policy trade-off between limiting competition with bank deposits and ensuring an effective transmission mechanism of

monetary policy.<sup>1</sup> The G7 has identified some of the other main tradeoffs.<sup>2</sup> It identified four key trade-offs, being:

- Cyber security vs system performance, utility and adoption: Cyber resilience and system security is fundamental to trust and confidence – a system at risk of breach will not be used. But any requirements may have knock-on implications for system performance (speed, range of functions including the potential applications of programmability). This, in turn, may impact CBDC adoption and utility, particularly in how far such CBDCs can support innovation.
- Operational resilience vs diversity and competition: CBDC will be critical infrastructure, so operational resilience is of upmost importance. But compliance requirements to deliver this resilience may risk excluding smaller firms with fewer resources from participating and may limit diversity and competition.
- Reducing illicit finance vs privacy and inclusion: CBDC systems might enable enhanced transparency and rigorous standards of documentation and verification which are not possible with cash. This could help reduce illicit finance and ensure sanctions compliance. But this could have implications for users' privacy and the ability of those without documentation to access the CBDC system.<sup>3</sup>
- Privacy vs diversity in business models and financial inclusion: Strong standards of privacy support inclusion by giving confidence to use CBDC. But strict restrictions on data use could serve to reduce the range of possible business models in a CBDC system, and increase costs to users, which could deter use or encourage the use of less private alternatives.

1IMF (2022), Behind the Scenes of Central Bank Digital Currency, February 9. 2Group of Seven (G7) (2021), G7\_Public\_Policy\_Principles\_for\_Retail\_CBDC, 14 October. 3The IMF has also identified that anonymity can be used for illicit purposes and can undermine AML/CFT measures. Anonymity, therefore, poses a policy trade-off—the more anonymity, the larger the risk for illicit use. See IMF (2022), op. cit.

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*Name or Organization*

Securities Industry and Financial Markets Association (SIFMA)

*Industry*

Trade Organization

*Country*

United States of America

*State*

District of Columbia

*Email*

pryan@sifma.org

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Because 73 percent of all U.S. economic activity is funded through capital markets activities, it is vital that capital markets impacts be a central consideration for policymakers considering adoption of a U.S. CBDC. There are several potential capital markets use cases for a “limited purpose” or “wholesale” CBDC (referred here to as “wCBDC”) that would be used for institutional financial transactions rather than a more widely available public “retail” CBDC (“rCBDC”), many of which have already been the subject of tests and experimentation. These use cases highlight some of the potential benefits of wCBDC, particularly in the cross-border payments space; they also help us better understand important policy and design tradeoffs that would need to be considered prior to implementation. See the cover letter, Section 1 “Scope of Response,” Section 3.1 “Securities Settlement,” and Section 3.4 “Impacts of CBDCs on Cross-Border Capital” on pages 2-6, 22-25, and 27-30.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

While we are not yet able to opine on the desirability of adopting a U.S. CBDC, we do believe that a wCBDC model would be a preferable approach to achieve the potential benefits of a CBDC for the following reasons. A wCBDC would be less disruptive to the financial system and financial stability than a rCBDC; it would provide a testing ground for experimentation of key systems amongst a small group of sophisticated and established financial actors; and has more proven and obvious use cases than a rCBDC. A wCBDC would also be less politically fraught, raising fewer concerns around issues such as consumer privacy than a rCBDC. Finally, a wCBDC may also be more effective than a rCBDC in preserving the U.S. dollar’s status as a reserve currency and as the predominant currency for international financial transactions. First, at a conceptual level, a wCBDC could serve as a bridge between an “on-chain” financial system and the traditional financial system. That is, if the financial system evolves such that more transactions move into a blockchain-based environment with new forms of payments and financial services, a wCBDC could help payments services providers more easily move funds on a wholesale basis within the blockchain environment (e.g., to other payment services providers on behalf of underlying customers) and transfer funds from the blockchain environment to the legacy financial system (e.g., a transfer of a wCBDC to a traditional central bank reserve balance, which can then be used in the traditional financial system). Second, a wholesale digital payments system could be significantly less disruptive to monetary policy and financial stability than a more widely accessible rCBDC (with its potential to disintermediate the banking industry and disrupt short-term funding markets), particularly if a wCBDC were confined initially to institutions that already have direct access to central bank money. Third and related, a wCBDC would provide policymakers with the opportunity to study and test a new payments system amongst a relatively small group of sophisticated and experienced financial institutions. This would enable policymakers to address operational issues prior to more widespread adoption. Fourth, wCBDCs have already been shown in existing experiments to be viable and there are several important use cases where they could improve existing securities markets processes and infrastructure. Moreover, successes in these areas could help with future expansion into the retail space. For example, one of the most-discussed benefits of a wCBDC is its potential to deliver faster, cheaper and safer cross-border institutional payments. While that would have little immediate direct impact on consumers, the payment rails developed to facilitate cross-border wCBDC applications could lead to improvements in the cross-border payments infrastructure available

to retail end-users, which may make it easier for the public to make direct remittances and other payments across borders in the future. Fifth, as the Board's discussion paper notes, one of the rationales for adopting a U.S. CBDC would be maintaining the U.S. dollar's status as the most widely used currency for payments and investments, as well as its status as the world's reserve currency. A U.S. wCBDC would be well positioned to maintain the currency's reserve status and its predominance in financial markets transactions. In particular, it would support U.S. participation in mCBDC arrangements in the areas where U.S. capital markets play a key role internationally, such as through foreign participation in Treasury auctions, FX markets, cross border payments – both for financial institutions and their corporate clients, as well as cross border investment. It could also be used to support swap line arrangements with other countries that may also adopt a wCBDC, thereby helping to maintain the dollar's reserve currency status. In contrast, a retail-only U.S. CBDC would not support the use of the U.S. Dollar in these institutional markets. Finally, it would initially be politically easier to implement a wCBDC. A wCBDC would not, for example, incur the same sorts of individual privacy concerns that could arise in a rCBDC context or require the same sorts of considerations of how to allocate risk and liability between the private sector and government with respect to operational and cyber issues. Although we believe that adopting a wCBDC could provide the benefits of a rCBDC without the corresponding risks, we also believe that further study is needed to fully assess the costs and benefits before moving forward with adoption. See the cover letter, Section 1 "Scope of Response", and Section 2.1 "Access" on pages 2-8.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

We do not address this question in our response given that we focus on the impact of CBDC (and specifically a wCBDC) on the institutional capital markets rather than the broader public.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

In its paper, the Board raised the question of whether CBDCs could have the potential to impact the goals and implementation of monetary policy. While SIFMA does not have a position on how a potential CBDC might affect the ability of the Federal Reserve to meet its monetary policy goals within the broader economic environment, we agree that it is important for policymakers to consider potential impacts on a wCBDC and/or rCBDC on the Federal Reserve's execution of monetary policy. As part of the analysis, we believe it is important to look at both the mechanics and the infrastructure supporting the Federal Reserve's monetary policy and how these processes are impacted by the new functionality of wCBDCs and/or rCBDCs. Our initial analysis suggests that the fundamentals of primary dealers and investors interactions with the Treasury and Federal Reserve through auctions and open market operations would not be changed, in terms of pricing, settlement risk, and demand for Treasury securities, by a wCBDC. However, there could be changes to the mechanics of post-trade processes following auction take-downs as participants take advantage of the hypothetical new settlement functionality. Similarly, there could be changes to how foreign investors access US Treasury markets in the event that institutional wholesale mCBDC arrangements develop. While ultimately we do not expect these process changes to fundamentally affect the demand for U.S. Treasuries or their pricing, this functionality could offer potential new market efficiencies and the Federal Reserve should work with the operators of key market infrastructure supporting Treasury auction and settlement processes to understand potential impacts and opportunities of a wCBDC. In addition, to the extent a wCBDC is available to nonbank entities that operate a narrow bank or payments-only business model, the potential effects on monetary policy of having pass-through investment entities available to provide indirect access to central bank money should be considered. See Section 3.2 "Considerations Around the Execution of Monetary Policy" on pages 25-26.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

There has been extensive discussion about the potential substitution effects of rCBDC away from bank deposits, but there has been less focus on the impacts of CBDCs on capital markets-based funding models. We recommend the policy makers examine the potential impacts of CBDCs on other funding models, including both the impacts of rCBDCs and wCBDCs. One area of impact could arise if either form of CBDC (though most likely a rCBDC were to be viewed as a substitute for investments in other low risk, liquid assets, such as MMFs and Treasury bills that have features that make them near-cash instruments or comparable to bank customer deposits. This potential substitution effect could lead to abrupt shifts in their funding. For example, at end-2019, there were an estimated \$7tn of AUM in

MMFs. Depending on its design features and its relative remuneration (if accounts were interest bearing), the introduction of a CBDC could be an attractive alternative for some risk-averse holders of other cash-substitutes, even in benign conditions. This in turn could reduce the demand for assets that such funds invest in, possibly affecting yields in turn.

Mitigants for this substitution effect could include:

- o **Quantity measures/limits:** these would restrict the use of CBDC by either imposing caps on the total holdings of CBDC or limiting the transfers of CBDC. Quantity limits could either be stock-based (central banks limit that amount of CBDC that can be held) or flow-based (restricting the amount of CBDC that can be transferred within a given period). However, policymakers should bear in mind that political pressure could be brought to bear to raise or otherwise alter limits during periods of significant market stress, potentially limiting the effectiveness of these measures.
- o **Price measures:** these could be used to disincentivize holdings of CBDC or large payments in CBDC without necessarily restricting them. For example, CBDC accounts could be prohibited from earning interest, thereby making it more “cash like” than “deposit like.” Progressive fees for transferring larger amounts of CBDC could also be another mechanism to disincentivize large holdings of CBDC.
- o **In-crisis measures:** in the event of a run-event, gates or switching limits could be imposed. More broadly, policymakers should consider the potential impacts on the capital markets of a substitution out of bank deposits which could arise if a rCBDC becomes more desirable. Because banks need to rely on such deposit funding to a greater degree than nonbanks, there could be a range of unforeseen impacts on traditional wholesale funding markets and on other market participants as a result of such substitution effects. See Section 3.3 “Impact of a CBDC on Funding Models” on pages 26-27.

wCBDCs could also have significant impacts on the FX markets that merit further study. While wCBDCs do offer the potential to execute and settle FX transactions in new and more efficient ways, these potential benefits need to be understood in the context of the various legal, interoperability, and infrastructure issues that a wCBDC would raise. These issues would need to be addressed to support CBDC enabled FX transactions. See Section 3.4 “Impacts of CBDCs on Cross-Border Capital: Wholesale FX” on pages 27-29. Finally, the analysis of the benefits of a potential U.S. wCBDC should also examine the impacts on cross border capital markets investment flows, and more broadly how a wCBDC could impact the U.S. as a destination for international securities investment and as a hub for cross-border capital markets. See Section 3.4 “Impacts of CBDCs on Cross-Border Capital: International investment” on pages 29-30.

#### *6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

The impact of a CBDC on the financial sector may vary depending on whether financial institutions are required to act as CBDC “intermediaries” (which would be more common in the wCBDC context) or a narrower “distributor” role (which would occur more often in a rCBDC context). This distinction is certainly important when considering potential disintermediation effects of different CBDC operating models (an issue we do not discuss in length here). It is also crucial in evaluating who bears financial responsibility for key risks associated with CBDC, and therefore, how likely financial institutions would be to participate in any CBDC system. Banks (and other financial institutions with direct access to a wCBDC) would be acting as intermediaries when they receive wCBDC from another institution with direct access to the wCBDC system. They would also be acting as intermediaries if they were to issue CBDC-like instruments that have sometimes been referred to as “synthetic CBDC” backed on a one-to-one basis by central bank reserves – essentially a form of stablecoin. In either scenario, the responsibility for various operational, cyber, and compliance risks associated with the wCBDC or CBDC-like instruments would clearly lie with the financial institution acting in an intermediated capacity. When acting as “distributors” of rCBDC, financial institutions would provide rCBDC accounts or digital wallets and charge fees for ancillary services, but the rCBDC itself would be a liability of the central bank rather than the financial institution. Since the rCBDC would not be a liability of the intermediary, it could not be used to support revenue generating trading or lending activity. At the same time, there would be numerous potential operational and cyber risks attached to providing these accounts, plus a variety of compliance costs. Would banks be responsible for all of these costs when acting as a distributor of rCBDC? And if so, would the limited revenue and high costs lead banks and other financial institutions to opt out of participating in a rCBDC system, thereby undermining its effectiveness? Are there mitigants to this potential problem and how would they work (e.g., perhaps through some form of cost sharing between the central bank and financial institutions)? Those are all crucial questions for policymakers to consider before moving forward with adoption of CBDC, particularly if they were to ultimately adopt a rCBDC. See Section 2.4 “Implications for Banks Acting as ‘Distributors’ versus ‘Intermediaries’” on pages 10-11). Furthermore, a CBDC could adversely affect the financial sector through its impact on monetary policy and financial stability, and as a result of any overly punitive regulatory requirements that may be imposed (e.g., prudential treatment or risk management requirements). See Section 2.3 “Prudential Treatment” on page 10 and

Section 2.5 “Risk Management” on pages 11-14.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Mitigants for the substitution effect created by CBDCs are discussed in the response to Question 5. Furthermore, many of the potential risks associated with a CBDC may be mitigated by requiring CBDCs to be intermediated by regulated financial institutions as discussed in the response to Question 11.

*8. If cash usage declines, is it important to preserve the general public’s access to a form of central bank money that can be used widely for payments?*

We do not address this question in our response given that we focus on the impact of CBDC (and specifically a wCBDC) on the institutional capital markets rather than the broader public.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

While wCBDCs offer the potential for settlement innovation, they are neither necessary nor sufficient for the evolution of existing settlement models and settlement times. In particular, the acceleration of settlement cycles must be understood in a broader context of securities products and operations that are adopted by market participants in practice. While wCBDCs could potentially enable new settlement models and new settlement infrastructure that would drive gains in efficiency, capital reductions and risk reduction, the unique features of wCBDCs are best understood as an enabler of these changes and one element of a broader process of innovation and change. See Section 3.1 “Securities Settlement: Securities settlement – limits to the benefits of CBDCs” on page 22. The creation of a CBDC is not in and of itself sufficient to enable changes in settlement processes. The functionality provided by CBDCs would need to be supported by a range of other changes in settlement infrastructure itself, the participation and responsibilities of the counterparties to the transaction, as well as potential changes to ancillary products and services dependent on current settlement models.

Furthermore, many of the benefits of faster settlement or different settlement models often associated with CBDCs could be developed using other payment infrastructure such as stablecoins or settlement tokens using DLT infrastructure. If providing new infrastructure for the payment leg of securities settlement is a key objective for policymakers, they should also consider the degree to which these other solutions could achieve the same goals with less complexity to implement and fewer consequences to the broader financial system. For example, stablecoins have been explored as providing a ledger-based payment function to support faster settlement. Similarly, tokenization of existing fiat currency within a ledger-based settlement environment could offer focused benefits for the speed and efficiency of settlement. Within this context, a narrower scope institutional CBDC could be more easily inserted within the existing infrastructure system, providing new functionality at key points within post-trade processes to while minimizing disruption to the broader financial system. See Section 3.1 “Securities Settlement: wCBDCs are not necessary for settlement innovation” on pages 22-23. Potential future changes to securities settlement models incorporating wCBDCs must also take into consideration the market product, operational, and capital considerations connected to the broader settlement cycle, and in particular the challenges associated with settlement cycles shorter than T+1. DTCC has identified several important barriers, which make such a change impractical at present for the broader U.S. securities markets including: o Moving to T+0 on a transaction-by transaction basis will remove the liquidity and risk-mitigating benefits of current netting features; o Fails may increase due to lack of netting as transaction volume rises; o Funding needs will be less predictable and transparent until end of the trading day; and o Developing real-time reconciliation processes to comply with regulations will be difficult. SIFMA further accentuated the T+0 challenges in its August 13, 2021 letter to SEC Chairman Gary Gensler. In the letter, SIFMA confirmed its support for and confidence in shortening the settlement cycle to T+1, but also highlighted four specific areas that would be impacted significantly if T+0 was adopted: o Processes for global settlements, FX, margin investing, and securities lending would have to be redesigned to meet regulatory and contractual requirements in less than 12 hours; o Retail investors would likely have to prefund accounts; o Smaller firms and vendors may not have the resources necessary to complete a move to T+0 and, hence, could find their competitive position weakened; and Industry stakeholders – including the Federal Reserve’s payment systems – would have to maintain services for more hours during the day than currently, which could increase the potential for operational failure. See Section 3.1 “Securities Settlement: Securities settlement – challenges of T+0 and industry initiatives to shorten the settlement cycle” on pages 23-24.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Policymakers need to consider the impacts on U.S. capital markets if other major jurisdictions move to adopt their own CBDC and the U.S. does not. This is particularly the case for wCBDC, as it is unclear whether the adoption of rCBDC by other jurisdictions would have major implications on the U.S. capital markets or their competitiveness. At the same time, it is important not to overemphasize the importance of foreign CBDC adoption on the decision-making process for any future U.S. CBDC. While there are a number of areas where connections with foreign CBDCs could potentially drive market efficiencies or where the absence of a U.S. wCBDC could impact investment flows, ultimately these are far less significant considerations than the effects of a wCBDC on U.S. financial markets and infrastructure. There has been speculation that the U.S. dollar's status as a reserve currency could be threatened if it also does not move forward with a wCBDC. There are also questions around whether early adopters could enjoy significant first-mover advantages, which some have suggested should speed up adoption in the U.S. (though it is questionable whether rCBDC focused initiatives – for example, like that being implemented in China – would confer any significant advantages in this regard). While the U.S. dollar's preeminent role in the international system is undoubtedly driven by a range of factors, this will be an important consideration for policymakers considering adoption of a U.S. CBDC. It is possible that new forms of digital currency may have competitive advantages relative to older forms of currencies and may be appealing as holding for foreigners whose home country does not have a native wCBDC. However, these potential benefits should also be weighed against the degree to which mature and sophisticated capital markets infrastructure in the U.S. currently delivers these services to investors even without a wCBDC, in contrast to other jurisdictions which have explored a wCBDC as a solution to long standing challenges for their payments and investment infrastructure. An analysis of the impact of the presence or absence of a U.S. wCBDC on U.S. capital markets (e.g., on FX, cross-border payments and investment flows, international demand for U.S. Treasuries, etc.) needs to be grounded in the specifics of other major capital markets and their supporting infrastructure. Coordination with jurisdictions that have not yet launched wCBDC projects will be important as well, both to help share experiences that will help the design process for any future wCBDCs so they are more likely to develop in a compatible way, and also potentially to ensure that points of interaction between clients and institutions in their markets and platforms and institutions using any future U.S. wCBDC are incorporated in their regulatory frameworks with a minimum of disruption. See Section 2.10 “Implications of international CBDCs: Considerations if other jurisdictions adopt CBDC while the U.S. does not” on pages 18-19.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Many of the potential risks associated with CBDC may be mitigated by requiring CBDCs to be intermediated by regulated financial institutions. Specifically, such financial institutions should be able to incorporate wCBDCs into their existing risk management processes and solutions for clients without the need to create new risk frameworks to accommodate wCBDC infrastructure. Likewise, policymakers should avoid imposing additional risk charges on financial institutions handling wCBDCs. There is no reason why wCBDCs should incur an additional operational risk charge or any other technology risk factor. While the technology that a future wCBDC uses is still an open question, this technological uncertainty is not a reason to impose new capital charges on banks. Instead, policymakers would be better advised to be adopt an approach to these issues that is technology neutral and based on underlying risk. Doing so would not only reflect the emerging international principle of “same risk, same treatment” in this space, it would also avoid discouraging bank participation in the system. While any future wCBDC should generally be incorporated into existing risk management processes, there are several areas where its impact on particular risk factors ought to be studied, with an eye to minimizing risk impacts through the design and implementation of the wCBDC itself. These include credit and liquidity risks and operational and cyber risks. We discuss these risks in our full response. See Section “Risk Management” on pages 11-14.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

The Board’s discussion paper rightly raises privacy as a key consideration in the design of any CBDC and the decision-making process on its viability and desirability. While privacy concerns are particularly important in a retail CBDC, a wholesale environment does not raise the same sorts of privacy concerns that a rCBDC would. Compared with rCBDC, wCBDC applications would likely hold substantially less personally identifiable information and have less information related to individual transactions. We expect that under most wCBDC design

models, individual clients and their transactions would be aggregated under the accounts of the financial institutions they work with, provided that direct access to central bank money by individual clients is not allowed. This would reduce the scope of personal and transactional information which is captured by the wCBDC platform. However, privacy concerns are not completely absent from the design of a wCBDC. Depending on the architecture of the CBDC infrastructure and the role that intermediaries play in it, if it is possible to follow the transactions through the chain of the wCBDC infrastructure and if there is considerable transparency into what is visible and explorable, it could potentially trace transactions back to their originators as can be done on some public chains. This potential auditability of transactions by outside users ought to be avoided. Additionally, there are likely to be some institutional transactions and client types where privacy considerations need to be addressed. For example, many wholesale customers would be very sensitive to information on their transaction history being accessible e.g., if it led to investment strategies being revealed. More broadly, wCBDC design must not allow any transparency into individual transactions carried out by institutions, whether purchases by retail or wholesale securities clients, or purchases of goods or services by participating financial institutions themselves. Existing confidentiality regulations govern the protection of information on client transactions held at firms – any new CBDC infrastructure needs to be consistent with these confidentiality protections. The personally identifiable information (“PII”) of employees at financial institutions who are authorized to work with the wCBDC infrastructure on behalf of their firms also needs to be protected, given the contractual requirements for the protection of this PII. Therefore, privacy oriented mitigants need to be embedded from the outset even in a wCBDC system. Additionally, if a wCBDC eventually exists alongside a rCBDC, there will arise a new class of wholesale/retail interactions where policymakers need to be aware of privacy concerns, such as the aggregation of wholesale flows. As these issues are evaluated, policymakers should also consider whether new privacy standards need to be codified into law. See Section 2.8 “Privacy” on page 17.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Although further study needs to be conducted, there is no reason to believe that wCBDCs ought to have greater operational risk than current central bank money operating models. In fact, it is possible that the unique features of distributed ledger technology (“DLT”) could result in lower operational risk in some areas, though again that proposition would need to be subject to extensive testing. Close collaboration among the Federal Reserve, other participating infrastructure providers, and market participants would be critical to have a 360° view of operational risk and to help ensure that the appropriate controls and risk management features are embedded from the outset. Any novel approaches to the operational risk for users of wCBDCs should not, in and of itself, be treated as grounds for the imposition of any supplemental risk changes. See Section 2.5 “Risk Management: Operational risks” on page 12. We believe that cybersecurity considerations need to be front and center in the design of any future wCBDC platform. Given the digital nature of a wCBDC and its reliance on a range of new technology platforms to support the wCBDC, securing the technology infrastructure that supports the wCBDC would be critical. Cyber-attacks on wCBDC infrastructure could be driven by a range of motivations and carried out by many different types of threat actors. Cyber-attacks could be aimed at stealing non-public information on market participants, introducing inefficiencies in market infrastructure that they could profit from, potentially illicitly moving funds, or simply degrading the performance or availability of wCBDC infrastructure, such as by a hostile geopolitical actor or a “hacktivist” group. Regardless of motivation, scale, or type, a successful cyber-attack on wCBDC infrastructure would not only impact specific users but reduce confidence in the wCBDC itself and potentially the security of the central bank more broadly. While embedding cybersecurity in the design of the wCBDC from the outset is critically important, the specific features of cyber defense programs will depend on a range of other design considerations which shape the access points to the infrastructure and data it stores. These include access models, interoperability features, and any degree of programmability. See Section 2.5 “Risk Management: Cyber risks - general cybersecurity concerns” on page 12-13. Cyber risk associated with CBDCs should be differentiated into two levels – risk which exists at the level of the central bank and risk at the level of an institution which serves as the wallet provider (in distribution models). The degree of cyber risk at the level of the financial institution serving as the wallet provider will vary substantially depending on different distribution models for the CBDC. This level of risk will be critically important in understanding who bears the cyber risk, and as a result, the risks and incentives for financial institutions to take part in a CBDC program. See Section 2.5 “Risk Management: Cyber risks for banks serving as CBDC distributors” on pages 13-14.

*14. Should a CBDC be legal tender?*

We recognize that there is an ongoing process underway to address the question of the existing legal permissibility of a U.S. CBDC, as mandated by President Biden’s “Executive Order on Ensuring Responsible Development of Digital Assets.” Regardless of the outcome

of that process, it is crucial that the legal status and treatment of any CBDC (whether under statute and/or through regulation) be made equivalent to the legal status of legacy fiat currency, and that both be fungible with one another. Clearly defining CBDCs as equivalent to legacy fiat currency is necessary for the effective implementation of a wCBDC, and to prevent a range of unintended consequences which could increase costs and risks in the system. These costs and risks would include negative liquidity impacts owing to a bifurcation between activities in CBDC and traditional fiat money markets and infrastructure; it would also reduce the interoperability of infrastructure and create the risk of funding mismatches. There should also be clarity and consistency regarding key terminology. One area for clarity is the distinction between an “account-based” and “token-based” CBDC system. Many central bank speeches and papers, informed by the existing distinction between bank accounts and cash, have argued that these are distinct types of CBDC systems. An account-based system would operate in much the same way that central bank settlement accounts do today and is rooted in the concept of identity verification; that is, the payment from the account could be verified by knowing the identity of the account holder. By contrast, a token-based CBDC would be based on the ability of the users of the system to verify that the digital store of value (i.e., token) is genuine (others have defined CBDC tokens as “digital representations of value that are not recorded in accounts” – essentially digital banknotes). For example, to the extent any CBDC regime is indeed based on a token-based model, it would raise legal questions that an account-based approach (one that is essentially identical to the current system) would not. As noted, the digital token cannot be stored locally, but the private key that allows for the transfer of the tokens on the blockchain is stored locally. Should the legal framework then be updated so that the private key is considered the bearer instrument rather than the digital object/token? That is, should the key be rated as equivalent to physically holding the token or asset? Related to this is the question of who ought to be responsible for the loss of the private keys: should it be the owner or would it be a third-party service provider if one was used? These and likely other questions would need to be resolved in any legal framework, ideally in a manner that was consistent with other major jurisdictions across the globe. See Section 2.2 “Legal Status” on pages 9-10.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Price measures could be used to mitigate substitution risks. For example, CBDC accounts could be prohibited from earning interest to make them more “cash like” than “deposit like” and disincentivize holdings of CBDC or large payments in CBDC. See Section 3.3 “Impact of CBDC on Funding Models” on pages 26-27.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Quantity limits could be used to mitigate substitution risks. However, policymakers should bear in mind that political pressure could be brought to bear to raise or otherwise alter limits during periods of significant market stress, potentially limiting the effectiveness of these measures. See Section 3.3 “Impact of a CBDC on Funding Models” on pages 25-26.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Because we believe that a wCBDC has distinct advantages over a rCBDC, we answer the question of who exactly would have access to central bank money for settlement purposes in a wholesale environment? Direct access to central bank money today is generally restricted to banking organizations and, in certain jurisdictions outside of the United States, a limited number of non-bank, regulated payment systems providers. Limiting access to prudentially regulated institutions has been seen as important for a number of reasons: it allows the central bank to better fulfil its monetary policy objectives, promote financial stability, and ensure the safety and soundness of the banking system. In a wCBDC context, however, demand for direct access to wCBDC from other, non-bank market participants could grow as those institutions seek to settle transactions directly in wCBDC using their own accounts or wallets (as opposed to the current indirect model, with settlement occurring via a limited number of financial institutions with accounts held at the central bank). Policymakers would then need to decide whether to expand access to these institutions, and if so, what type of rules and oversight ought to apply to those entities – including whether to impose activities restrictions on nonbank institutions that have direct wCBDC access. And if access is granted, they would also need to settle a variety of important design questions, such as whether CBDCs can be created without pre-funding (i.e., can current central bank money be exchanged for wCBDC rather than increasing the money supply by issuing new wCBDC); whether intraday and end-of-day credit should be available to all participants or selected participants; and whether wCBDC would be recorded as on or off intermediaries’ balance sheets. Given these potential challenges, and for a range of practical reasons, we recommend that direct access to wCBDC be restricted to institutions that are subject to a

framework of regulation and supervision that is comparable to that currently in place for institutions with access to Federal Reserve master accounts and services. The Board could also consider whether the imposition of activities restrictions on non-bank institutions participating in this system would be warranted. See Section 2.1 “Access: Determining access to a wCBDC” on pages 7-8.

*18. Should a CBDC have “offline” capabilities? If so, how might that be achieved?*

This topic is not addressed in our response.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

We do not address this question in our response given that we focus on the impact of CBDC (and specifically a wCBDC) on the institutional capital markets rather than the broader public.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

SIFMA supports the Board’s view that any CBDC ought to be able to operate alongside legacy instruments and systems rather than replace them in order to minimize disruptions to the financial system and given that legacy systems have become significantly more efficient in recent years. The potential gains in efficiency and risk reduction from development of wCBDCs would be easier to realize if there is smooth interoperability with existing infrastructure, such as the ability to transfer balances between a wCBDC and traditional central bank reserve balances. This of course recognizes that new processes and infrastructure which build on the functionality offered by wCBDCs will likely gradually expand from smaller pilots in specific market segments. These pilots will often occur in partnership with existing infrastructure providers, who may handle multiple parts of the process using existing infrastructure even as new features are added. Interoperability will need to be built across multiple dimensions, including in the design of the wCBDC framework, its operating standards and protocols, and its technology architecture. wCBDC design needs to consider interoperability with a broad range of existing systems and infrastructure platforms. These must include, but are not limited to, existing and new wholesale payment instruments and systems; the broader capital market ecosystem and financial market utilities; cross-border foreign exchange systems; local rCBDC systems and local wCBDC systems; and ideally, cross-border and mCBDC arrangements. As we note later in our response, this will require both coordination with domestic regulators who oversee these infrastructure venues and markets as well as internationally, with foreign central banks and monetary authorities as they implement their own CBDC projects and with infrastructure venues in those jurisdictions as CBDC functionality is embedded in them. We recommend the Board and other policymakers look to the lessons provided by a variety of international wCBDC pilot programs, which have explored how wCBDC can be connected to existing payment and settlement infrastructure. For example, Project Helvetia is a joint experiment by the BIS, SNB, SIX and five commercial banks (i.e., Citi, Credit Suisse, Goldman Sachs, Hypothekarbank Lenzburg, and UBS). Although additional study is needed, this project suggests that a wCBDC could offer safe and efficient settlement on a tokenized asset platform and identified issues regarding the operational, legal and policy questions necessary for wCBDC issuance. Additionally, the Board should explore how existing infrastructure platforms have been able to create interoperability with an expanding range of adjacent payment and settlement services, such as the experiences of the Depository Trust and Clearing Corp (DTCC). See Section 2.6 “Domestic Interoperability” on pages 14-15 and Section 3.10 “Implications of international CBDCs: Cross-border interoperability – mCBDC” on pages 19-20.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

The potential for wCBDCs to be embedded with logic, or programmability, offers the potential for innovation and new functionality. However, programmability features need to be developed so they do not impair the fungibility of central bank money or introduce operational risk. See Section 2.7 “Programmability” on pages 15-16.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

CBDCs offer the potential for including some degree of programmability within the CBDC itself or associated with it. Programmability would allow users to embed logic for a predefined

purpose within the money itself. The restrictions created by the programming could be either open ended or limited – in dimensions such as time (permanent vs time limited), venue (programmability within a specific infrastructure platform vs across all uses), and others.

While some elements of traditional fiat money have limited programmability (such as the restrictions around checks or letters of credit), CBDCs would in theory allow for much greater programmability, both in terms of range of applications and the flexibility of the logic associated with the programming. It is possible that future DLT platforms could be designed to offer a broad range of new features building on programmable wCBDCs. In the institutional capital markets, researchers and pilot programs have identified a range of applications where programmability could increase the efficiency of capital markets products and infrastructure. For example, certain transactions could be programmed to be self-settling, or to embed features allowing payment on confirmation of transactions.

However, despite the potential benefits offered by programmability, policymakers need to consider the potential consequences of programmability more broadly, particularly for the fungibility of CBDCs with conventional fiat currency. These fungibility concerns could potentially be offset through appropriate design of the wCBDC programmability features.

Programmability features also raise a number of operational and cyber risk concerns which must be accounted for before it can be realized for any large-scale capital markets applications. If multiple platforms or infrastructure providers support transactions using programmable wCBDCs, there also would need to be a baseline of interoperability and harmonized standards to create an effective system. See Section 2.7 “Programmability” on pages 15-16.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Building a functioning CBDC ecosystem will be one of the Federal Reserve's most important policy considerations. Given that the Federal Reserve's discussion paper focuses on issuing a retail CBDC, in that context, these policy considerations are: (1) identifying user needs and consumer adoption such as why users may/may not adopt a CBDC, (2) outlining clear functions and responsibility for both public and private stakeholders, (3) considering comparative expertise and related capacity of the private sector, (4) building an incentive system to leverage the private sector's ability to innovate, (5) ensuring the horizontal coexistence of a CBDC and private digital money, (6) standardizing interoperability in cross-border and cross-currency transactions, (7) examining the effects of the increased diversity of options in payments, (8) building capacity and capability for instant payment at high transaction volumes, and (9) facilitating efficient fiscal transfers; all must be considered and discussed.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

No payment system is perfect, and all means of payment present tradeoffs. Therefore, it is important to achieve vertical interoperability for various actors to collaborate, and at the same time, secure horizontal interoperability in order to allow end-users to make a choice between payment methods for each transaction. The Federal Reserve's discussion paper focuses on issuing a retail CBDC using an intermediate model, where the central bank distributes CBDC indirectly to the general public through intermediaries such as commercial banks. However, the Federal Reserve may also consider issuing a wholesale CBDC, which might instead be provided to financial institutions and private digital currency issuers to achieve similar benefits. Specifically, a wholesale CBDC could be issued by the Federal Reserve and used as collateral by private digital currency providers. Such a scenario would effectively maintain our dual monetary system whereby the public sector provides stability and efficiency while the private sector focuses on innovation and diversity. Nonetheless, a well-designed CBDC system will provide new opportunities and promote participation from the private sector. The GDCA believes that this collaboration will drive innovation and increase the resilience of the financial system as a whole.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

A CBDC has great potential for promoting financial inclusion. However, the actual design will determine the nature and scale of its impact on improving access to the underserved. Lowering transaction fees can help improve access and provide more cost accessible and efficient payment means to the underserved. A domestic CBDC could also provide infrastructural support to a broader digital identity framework to eliminate key existing barriers for those excluded. A CBDC has the potential to decrease fraud in government distributions (i.e. tax returns and assistance) through access to a strong audit log and traceability traits that would greatly promote financial inclusion. However, it will be incumbent on the Federal Reserve to promote an architecture which enshrines these features, as without them, the complexity of a CBDC system may have the opposite impact on government oversight and accountability. If the intermediary-model (where intermediaries provide access to the CBDC to the end users) were to be implemented, those intermediaries

should not be limited to traditional banks, which might prefer current users who are already financially included and might not make much difference. If the intermediary function is open to new participants, that could shed light on those who are underserved in the current system and promote further financial inclusion. There should also be a system to ensure that the introduction of a CBDCs does not cause further financial exclusion through the lack of devices and a stable network. In addition, financial education accompanied by digital skill building should be offered widely to the general public. Otherwise, a CBDC may widen the digital divide and increase the possibility of causing an exclusion for the most vulnerable.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

The transmission of U.S. monetary policy has traditionally been delivered through the banking system. In certain environments, banks have chosen not to pass through changes in monetary policy in full. For example, depending on the design, a CBDC could dramatically improve the monetary transmission mechanism. In a direct retail CBDC system, the Federal Reserve could implement monetary policy directly and instantly in consumers' wallets with a remunerated CBDC. The same could be achieved through smart contracts in an intermediated system, achieving 100% pass-through via the deposit channel. In addition, a CBDC could offer the opportunity to implement negative interest rates, which would mitigate the challenges of the zero lower bound. However, the actual effect on the maximum-employment and price-stability goals would need to be closely considered by the Federal Reserve. In addition, CBDC could enable new policies through its programmable nature. Specifically, the central banks could influence the velocity of money, incentivize consumer consumption by encouraging spending/discouraging savings in a certain amount of time. However, the occasions and extent to which the central bank would actually use this policy tool must be considered carefully. Historically, the Federal Reserve's ability to implement monetary policy has been hampered by the fidelity of the resources at hand. For example, inflation is often reported as a static number, while in reality it fluctuates widely based on a number of factors, especially geography. A CBDC could provide a highly targeted response instead of a nationwide response that may not be universally warranted.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

The impact of a CBDC on financial stability will depend heavily on its design. In the extreme, a direct retail CBDC system could disintermediate the banking system and make the Federal Reserve responsible for all money creation and credit allocation, creating significant challenges for the financial system. Such a design might also require the Federal Reserve to host accounts for consumers directly, a requirement which is currently prohibited by current law. On the other hand, a CBDC built on a distributed ledger could enhance operational resilience and financial stability by eliminating single points of failure in the system. Furthermore, the promotion of a less centralized financial system could also enhance the resilience of the financial system by improving the diversity of service providers. Financial stability risks and mitigation will require careful consideration in the design of any future CBDC, and as such issues are complex, and it is not possible to draw conclusions at this early stage. There is also a global aspect to financial stability that cannot be ignored. The U.S. Dollar enjoys the luxury of being the world's main reserve currency. As such, the U.S. currently enjoys advantages on the world stage that could be challenged or eroded as other nations issue their own CBDCs.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

If the features of the CBDC system and infrastructure are vulnerable to risks, it could adversely affect the resilience of the financial sector. Thus, it will be very important to ensure a CBDC will fulfill the necessary capacity requirements, and to provide capabilities for a CBDC and its surrounding infrastructure to be flexible and adaptable. By its nature, a distributed model requires distributed solutions. In this case, we recommend a hard look at governance models within the participants along with a focus on systemic risk. In the view of the GDCA, scenario-based stress tests such as those imposed on banking institutions serve as an excellent model.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Access to central bank money is necessary for the general public to participate in everyday market transactions. If cash usage declines without the alternative of a CBDC or private digital currencies, the acceptance of cash might decrease even further. This could lead to an exclusion of certain populations, especially those who remain unbanked. However, even if cash usage declines, we suspect that the role of cash will never fully disappear, nor do we see its disappearance necessary for the adoption of the CBDC. The strengths of cash include being accessible to anyone and anywhere regardless of age, environment, and situation, as well as its enhanced privacy properties.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Because domestic transactions occur digitally through the banking system already, the absence of a CBDC is not likely to dramatically change the existing process of domestic digital payments. However, today, cross-border payments remain slow and expensive, and they would likely continue to remain so. Were a CBDC introduced, companies could build cross-border payment systems on the back of a CBDC, which could speed cross-border payments and at a lower cost.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Much like regular cash, the holders of CBDC may not be restricted to the citizens of that country alone. Therefore, the issuance of a well-designed CBDC by other large economies might increase the international influence of other currencies, resulting in the relative decline in the status of the U.S. dollar along with the benefits this status still provides to the U.S. economy. In addition, many of the benefits for cross-border payments and reserve currency status are enhanced by the ability to interact with other digital currencies around the world. In the end, the U.S. needs to do what is best to retain its international role as the reserve currency to the world.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

The GDCA recognizes that privacy concerns should be of the utmost importance when considering the implementation of a CBDC. There are new industry-led solutions in the digital asset space that demonstrate the viability of balancing AML/KYC objectives and privacy protection given the right design. These collaborative industry solutions allow for compliance with the Financial Action Task Force's Travel Rule while building in safeguards for the sharing of KYC information. Additionally, there are two-tier CBDC models that rely on commercial entities for distribution, onboarding end users, performing AML, KYC, and CFT. In this model type, current privacy protections can remain in place while also meeting AML/CFT objectives. However, the remaining challenge would be enforcing such existing practices globally with CBDCs. It is important that the Federal Reserve preserve the anonymity of users similar to current projections when usage of cash. This might include building a system such that the central bank can only access information about transactions between intermediaries, but does not have a record of the transaction between the end-users. However, for the purpose of crime prevention and investigation, it is also necessary to maintain a procedure where, with a warrant, investigators could obtain detailed transactional information.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

The CBDC should be a legal tender. The implementation of a CBDC could open a new door to the digitization of administrative processes such as tax payment. One of the benefits of CBDCs include the facilitation of efficient fiscal transfers, and it would be appropriate for the CBDC to be positioned as a legal tender from the standpoint of promoting financial inclusion.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

An interest-bearing CBDC would enhance the Federal Reserve's ability to operate monetary

policy directly and instantaneously to the holders of the CBDC. This would improve the transmission of monetary policy. However, an interest-bearing CBDC could also cause a shift away from commercial bank deposits into the CBDC, creating funding issues for commercial banks. This might be particularly acute in a stressed environment, but it could raise funding costs for banks in equilibrium too. In the case of the negative interest rates, the holders would experience a severe inflation cost that would result in the avoidance of a CBDC, particularly if there are easily accessible private digital alternatives.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

If there are some quantity limits, that would mean that beyond that limit, the end users will have their money in the form of cash or cash deposit. This will restrict the flexibility of payment in the form of CBDC as well as cause confusion among intermediaries and end-users constantly having to check what form of money they have, not just the amount. It is also not appropriate considering that the CBDC is programmable when cash deposits are not. If the CBDC was interest bearing, the end-user's effect would differ depending on the amount and the form of money owned. The quantity limits could also be a useful tool when balancing the anonymity of money and compliance with the AML/KYC. There could be various levels of AML/KYC where according to the potential risk and quantity could be used as one standard. With that said, we recognize there may be a rollout phase where we need to develop trust and foster adoption where one way option would be by requiring some limits as guardrails.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Intermediaries should not be limited to traditional banks. Nonbanks and other new actors could serve as an intermediary, subject to federal or equivalent oversight structures. However, the institutions should have the capacity and capability to provide an infrastructure to enable high-volume, high-speed transactions in a stable manner. In addition, the institution should be resilient to financial and cyber risk, protect user privacy, and most importantly have the ability to follow compliance measures such as conducting an AML/CFT.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Offline capabilities mean being able to use CBDC whenever or wherever necessary, even if the network is unavailable. It would promote further financial inclusion regardless of the network infrastructure the end-users have. CBDCs must be accessible regardless of the region and digital capacity. A lack of high-speed internet should not determine accessibility. Offline capability is also a good feature to counter operational disruptions and cybersecurity risks. Being able to use CBDC even in the case of disaster is necessary for a resilient financial environment.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Interoperability is an essential part of the CBDC design to leverage the privately driven digital standards that already exist and are constantly evolving. In addition, it is crucial that transferability is not just for private digital money but also for other jurisdiction's currency when sustaining the dollar's international role and presence. If other currencies succeed in building a more user-friendly or interoperable platform compared to the U.S., it might cause a shift from the U.S. dollar and cause decline in the U.S. dollar's international status.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Technological innovation is most likely to come from the end-user, private digital money, or intermediaries. Therefore, the CBDC should be designed to be resilient, flexible, and adaptable to react to future innovations, but at the same time avoid rapid changes that would adversely affect the market. As history shows, balancing innovation and stability to maintain trust in the financial system is essential. The pace of innovation in this space will increase rapidly and its breadth will widen as well. This innovation should not be discouraged through regulation. Therefore, a tiered system of guardrails that promote trust and foster movement towards a stable, easy ecosystem as appropriate. While the architecture of the ecosystem will require thorough consideration, the guardrails should be considered based on multiple factors

such as usability, implementation, system risk, and liquidity.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

The design of the CBDC should consider interoperability in cross-country and cross-currency (including private digital money) transactions in order to build an ecosystem which leverages the private sector's ability to innovate and allows the end users to have a choice of what form to pay from a variety of options to best meet their needs.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

I expect that, in view of recent developments in the markets, the Fed is feeling more cautious about a CBDC than it was a few months ago. Nonetheless, it is important to understand the benefits and risks of digital assets and of the digitization of financial trading generally. My comments below duplicate those I submitted to OSTP last week, and they focus on certain technical aspects of the technology -- especially the problem of transient information asymmetries and the inefficient "racing" that they encourage. I also offer one potential remedy, the use of a random delay (a type of speed bump) to mitigate the incentive of traders to race. Pursuant to President Biden's Executive Order on Ensuring Responsible Development of Digital Assets, the Office of Science and Technology Policy (OSTP) is seeking information on the energy use and climate implications of digital assets and their associated infrastructure. This is entirely appropriate, but it is also too narrow a perspective. In addition to any climate externalities, the markets for digital assets are plagued by another more fundamental market failure, known to economists as "information asymmetry." Transient information asymmetries are ubiquitous in digital markets, and cause a race to trade that wastes enormous amounts of energy, as well as capital. Even if the electricity used for mining digital assets was entirely free of environmental externalities, it would still be mostly wasted. Other risks loom, including dangerous overcrowding of satellites in low earth orbit. It is important for federal agencies to understand these risks, and their possible remedies, before setting policy for digital assets.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

The development of digital assets and distributed ledger technology has raised the prospect of substantial benefits, but also some important technical challenges, including a fundamental dilemma. The one thing that we expect a financial ledger to do is record an unambiguous sequence of transactions, or events. But as Albert Einstein showed more than a century ago, spatially separated events do not always have an unambiguous sequence. For this reason, decentralized ledgers will always need some kind of consensus process to resolve irreducible space-time ambiguities, and that process will necessarily impose speed limits on the pace of transactions. The speed of light is plenty fast enough for humans conducting business around the world; so this relativistic constraint would be just an interesting footnote to the story, except for two things. First, it is possible to exploit the ambiguity of sequencing by, for example, deliberately sending instructions to spend the same digital coin on opposite sides of the planet at the same time. Any distributed ledger system will need to be able to detect such hacks, which can take much more elaborate forms. The Wall Street Journal reports that a major theft of a stablecoin in April was accomplished using a digital flash loan of a billion dollars, that was repaid in less than a second. The more intractable problem is that, quite apart from such obviously dishonest hacks, high-speed digital markets are extremely susceptible to the problem of latency racing and its associated inefficiencies, due to the ubiquity of transient information asymmetries. George Akerlof, the husband of Treasury Secretary Janet Yellen, received the 2001 Nobel Memorial Prize in Economics for his work describing the inefficiencies that arise in markets characterized by asymmetrical information.

There are other serious risks that merit OSTP attention. One danger on the near horizon is that latency racing will cause catastrophic overcrowding in low earth orbit, as too many redundant laser-linked satellites are launched, in orbits that may be too low, in order to serve high-speed traders who are seeking the shortest possible great-circle pathway through the

vacuum of space. Racing can be extremely resistant to regulatory solutions. It is important to address the underlying market failure, rather than just the symptoms. OSTP is in a good position to undertake needed research, drawing on resources throughout the government.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Transient Information Asymmetries in a Relativistic World We have decades of experience programming computers to cooperate with each other; today it is commonplace to have a multi-processor in a cell phone or even a wrist watch. Unfortunately, we also have decades of experience with hostile actions by computers or malware. Markets for digital assets present an altogether different problem: computers that are competing with each other – not entirely cooperative nor adversarial, but rivalrous, even while pursuing mutual gains from trade. This is the domain of economics, or perhaps AI-economics. We know the conditions under which markets work well; we also know the conditions that lead to market failures. Information asymmetries are a well-known market failure; and one, it turns out, to which digital systems are particularly sensitive. Transient information asymmetries are ubiquitous on electronic networks and drive the race-to-trade, an unproductive and wasteful competition to exploit infinitesimal advantages in the speed of communication. In the past twenty years automated financial trading systems have been plagued by this market failure. Real resources may be expended in a zero-sum race for advantage that cannot improve efficiency. An illustration can help. When the Bureau of Labor Statistics (BLS) releases the latest unemployment figures, it takes pains to make them accessible to everyone at once, in accord with U.S. Statistical Policy Directives. This is a laudable goal, but also one that is physically impossible; information cannot propagate across space faster than the speed of light. In practice, companies like Bloomberg and Thomson Reuters consistently access the BLS data first, and transmit it at high speed to client computers in New Jersey co-located with the major trading venues there. They can do this because they have made substantial investments in high-speed computing and proprietary communication infrastructure. For a fraction of a second, the public information from BLS can be exploited profitably by the small subset of traders that are able to access the information, and the market, faster than anyone else. Similarly, as vividly depicted in the movie "Trading Places," the latest crop reports from the U.S. Department of Agriculture (USDA) have substantial trading value before they are universally known. But in the first few milliseconds after their release, they cannot be universally known. Data released in Washington DC is quickly transmitted to commodity markets in Chicago as well as New York, where algorithmic trading systems exploit the temporary advantage it gives them to profit at the expense of less well-informed traders. In such zero-sum games, the gains of the winners are not simply offset by the losses of the losers; they are also offset by the real resources expended by all to engage in the latency race. USDA has taken steps, with limited success, to disrupt the race to trade on its data; indeed, all of the federal statistical agencies are struggling with the problem of how to release data more fairly. High-speed traders sometimes use the Efficient Market Hypothesis (EMH) to argue that they are making markets more efficient. But the EMH addresses only the static efficiency of prices; it says nothing about the efficient speed of reaching those prices – especially when speed is costly. In fact, there is no economic efficiency justification for the substantial cost of getting access to public data a microsecond faster than a rival is able to get it. The real resources expended in that effort are a manifestation of waste, caused by transient information asymmetries that are difficult to avoid in a world where communication approaches light speed. Releases of government data are only one example of public (or soon-to-be public) information that has temporary trading value while it propagates unevenly through space. Probably the most important such data are the so-called market data thrown off by the trading venues themselves – information about rapidly changing prices and quantities of recent transactions and pending bids and offers. The advantage of rapid access to market data is what keeps algorithmic traders tightly clustered around trading venues. One might have expected that, with the advent of public high-speed communication networks, trading might have moved to "the cloud" – offsite data centers with fast access to those networks. To some degree, that has happened. But a more prominent trend is the move towards ever more tightly concentrated market clusters – equity markets in New Jersey, commodities in Chicago, currencies in London – and to a web of proprietary communications infrastructure that pushes ever closer to the speed of light.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Initially latency racing took place on electronic circuits; these were quickly superseded by faster fiber optic networks. The speed of light is faster in air than it is in glass, however, so microwave networks have been built to outrace the fiber; and, over shorter distances, hollow fiber has begun to displace solid glass fiber. The latency race will soon be entering a new phase. The latest development in high-speed long-distance communication is the launch of constellations containing thousands of low earth orbit (LEO) satellites, connected to each other by lasers in the vacuum of space, where light reaches its maximum speed. These satellite systems will provide a wide range of communication services. But latency arbitrage in financial markets is likely to be a major influence on the configuration of these systems, just as it has been for communication systems on the ground. The National Oceanographic and Atmospheric Administration (NOAA), is tasked with regulating the safe commercial use of space, and is wrestling with the risks that may arise from overcrowding in low earth orbit. Coincidentally, NOAA also regulates ocean fisheries, and therefore is very familiar with the “race to fish” that occurs in poorly regulated fisheries; racing in both fisheries and financial markets can result in “overcapitalization,” a wasteful investment in an unproductive competition for speed. The Federal Trade Commission is concerned about congestion in the radio frequencies used to communicate between earth and space. The Defense Department is concerned about the risk of satellite collisions and debris cascades. And financial regulatory agencies are concerned about the stability of financial markets and their vulnerability to high-speed flash crashes. All these agencies need to understand the underlying causes of these risks, which are not easily regulated away. Below I describe one possible technical solution, the use of an encrypted latency channel that slightly slows the pace of trading.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public’s access to a form of central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Design of an encrypted latency channel In recent years financial markets have seen experimentation with various types of “speed bumps” to defend against high-frequency traders. One type uses a random delay on orders arriving at an exchange, so that temporal priority is assigned by lottery rather than by speed. For decentralized digital assets, it may make more sense to move the random delay into the communications network used by traders. An encrypted latency channel describes a novel method of communication on a network, providing a channel with leveled and randomized latency, for the purpose of discouraging racing in financial markets. Messages delivered through this channel will have a latency that is, within a certain range, unpredictable, and that therefore conveys no information about the origin of the message; in this sense, it may be called “encrypted” latency. Within the geographic footprint of the encrypted-latency channel, all points on the network are effectively equidistant from one another. When executable orders for financial trading are transmitted through such an encrypted-latency channel, with the restriction that such orders may be crossed only with other orders that are similarly transmitted, the result is a level playing field that confers no latency advantage to traders at any particular geographic location. This not only will allow more flexibility in locating trading operations; it will also allow more flexibility in locating financial exchanges (i.e., matching engines). Exchanges need not be clustered together, as they tend to be today, and algorithmic trading machines need not be collocated with the exchanges. When conducted through encrypted latency channels, financial trading can take place in a virtual “space-time cloud” that is, within limits, both spatially and temporally agnostic. Importantly, an encrypted latency channel can – indeed, it must – exist side-by-side with faster communication channels. This allows information to travel through a network faster than does trading activity, so that transient information

asymmetries will dissipate before they can be exploited.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

An encrypted-latency channel can be constructed on various types and sizes of communication networks. For example, a channel with an average latency of less than a millisecond, on a microwave network in northern New Jersey, could encompass all of the existing stock exchanges in the United States. On a larger scale, a channel with an average latency of a few of hundred milliseconds, on a constellation of laser-linked satellites in low earth orbit, could encompass the entire planet, providing customers with the ability to trade, with no latency handicap, from anywhere on earth. (This might be called The Random Access Planet. COOP-YMMV: Customers On Other Planets, Your Mileage May Vary.) The use of encrypted latency is not something that needs to be mandated. Trading platforms that take advantage of encrypted latency communication should be able to coexist, and compete, with platforms that do not. The primary advantage of an encrypted latency channel is that it inhibits wasteful latency races based on transient information asymmetries. Traders using an encrypted latency channel are effectively agreeing that temporal priority at the matching engine will be established, not according to who has access to the fastest equipment, but by lottery – i.e., by the random component of the encrypted latency. Within its geographic footprint, an encrypted-latency channel on a communications network will convey messages with an imposed latency that has approximately the same expected value, regardless of the point of entry and point of delivery. But the latency will not be uniform; it will have a minimum value and a maximum value, and a random distribution in between. Alternatively, the encrypted latency can be thought of as being the sum of a fixed component (the minimum latency) and a random component. Along with the properties of the underlying communication technology, the fixed component effectively defines the geographic “footprint” of the channel; it must be long enough to allow the network to deliver a message between any two points in the footprint within that timeframe. The random component of the latency has a distinct function: it makes the total latency unpredictable, in order to discourage wasteful investment in latency racing. Conclusion Many investors will view the encrypted latency playing field as more fair than the race-to-trade system that prevails today. But the efficiency arguments are even more compelling than the fairness arguments. By reducing the private rewards of racing behavior and the greater private losses by slower traders, encrypted latency can reduce the net social costs – which likely exceed \$100 billion per year across global markets – that arise from transient information asymmetries. In addition to improved trading efficiency, encrypted latency can help address some other related aspects of financial markets that have recently raised concerns. By slightly slowing the pace of trading (and thereby decoupling it from the pace at which public information propagates) encrypted latency can improve market stability and help suppress flash crashes. It will likely reduce the growth of PFOF: payment (by high-speed traders) for exploitable order flow. By suppressing an unproductive competition for speed at the bleeding edge of what is technologically possible, it should help avoid overcrowding of satellites in low earth orbit, and congestion in associated radio frequency communications. By ensuring that communication can take place faster than trade execution, encrypted latency channels can help cryptocurrencies avoid variations of the “racing hack” – an attempt to spend the same coin on opposite sides of the planet at the same time. Encrypted latency channels can also be helpful in finding ways to reduce the excessive electricity use (and associated CO<sub>2</sub> emissions) caused by redundant efforts to mine cryptocurrencies. In virtual worlds, encrypted latency channels can provide a stable and secure platform for financial transactions even as other types of virtual interactions take advantage of full-speed communication channels. More generally, encrypted-latency communications can enable the development of delocalized finance (“DeFi”) – a version of decentralized finance (“DeFi”) that delocalizes transactions in time as well as space, in recognition of the physically reality that the two are inextricably intertwined.

*14. Should a CBDC be legal tender?*

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

*17. What types of firms should serve as intermediaries for CBDC? What should be the role*

*and regulatory structure for these intermediaries?*

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Notes: 1) Brian Mannix is the president of Tamer Trading Technologies LLC, which develop innovative methods to improve the efficiency of financial trading. He is also a Research Professor at The GWU Regulatory Studies Center. This comment conveys the views of the author, not those of George Washington University. 2) See Mannix, "Space-Time Trading: Special Relativity and Financial Market Microstructure," 2016. <https://regulatorystudies.columbian.gwu.edu/space-time-trading-special-relativity-and-financial-market-microstructure> 3) For a general discussion of this phenomenon, see Mannix, "Races, Rushes, and Runs: Taming the Turbulence in Financial Trading," 2013. <https://regulatorystudies.columbian.gwu.edu/races-rushes-and-runs-taming-turbulence-financial-trading> 4) U.S. Patent Nos. 10,127,612 and 11,263,694. 5) Patent pending.

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*Name or Organization*

Texas Bankers Association

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Trade Organization

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

On behalf of the almost 400 community bank members of the Texas Bankers Association, I am writing to comment on the Federal Reserve discussion paper on money and payments issued in January of this year. While a central bank digital currency (CBDC) may offer some benefits, we believe that the proposal, which is defined as a “digital liability of a central bank that is widely available to the general public,” could significantly harm traditional banks, rural communities, small businesses borrowers, and consumers. The Federal Reserve envisions a CBDC as a close substitute for commercial bank deposits and other low risk assets. As proposed, the CBDC will be a government-backed competitor to bank retail deposits, which count for 71% of bank funding today. The loss of this funding source will severely limit credit availability to businesses and consumers. According to the American Bankers Association, even if individual CBDC accounts were capped at \$5,000, traditional banks would lose \$720 billion in deposits. In normal economic times, many consumers and small businesses will prefer an account at the Federal Reserve over a traditional FDIC-insured account at a bank. Community banks, which currently make over 50% of all small business loans, will have to curtail lending. In economic downturns or times of stress, it is reasonable to assume that trillions of dollars will flow into Fed CBDC accounts. Bank funding for loans to crawl out of an economic slump will not be there. Successful stimulus programs, such as the PPP, will be precluded due to a lack of deposits. Community banks were hit hard with a dramatic increase in compliance costs that emanated from the Dodd-Frank Act. There are 30% fewer bank charters today than there were in 2010. The driving force for consolidation was the increase in compliance costs. If policy makers in Washington decide to give the Federal Reserve a monopoly on deposits, it will be another crushing blow for remaining community banks. Rural economies will be adversely affected even more. The CFPB recently started a new initiative that focuses on rural areas. The agency focus is on “rural banking deserts.” Such deserts will only expand if rural banks cannot access the local deposits that they need for consumer, agricultural, and small business loans. Rural consumers will have fewer financial choices, leading many with the only option of accessing subprime and predatory lenders. Financial inclusion will not be enhanced with a CBDC. The unbanked will be less likely to have deposits in banks and lose the ability to work with bankers to create savings, get a mortgage, and secure a financial future. Texas banks actively promote and educate consumers in the areas of financial literacy, business literacy, and the Bank On program. A government-backed depository will not have the intended result of helping the unbanked. We do not think that a CBDC will support the dollar or help maintain the dollar as the world’s reserve currency. Other central banks may create digital currencies, so far mostly wholesale, but the reason the dollar is the favored currency has much more to do with the strength of our economy, our financial markets, and the rule of law. The real threat to the dollar is in the area of fiscal responsibility. The creation of a CBDC is a solution in search of a problem. As proposed, we are concerned that the creation of a CBDC will cause more harm than any potential benefit. We appreciate the Federal Reserve’s open mindedness in seeking out

opinions on this very important subject and we agree that the elected branches of government are the best bodies to formulate policy in this area.

4. *How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*
5. *How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*
6. *Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*
7. *What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*
8. *If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*
9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*
10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*
11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*
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21. *How might future technological innovations affect design and policy choices related to CBDC?*

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

Samuel Gostomski, Texas Blockchain Council

*Industry*

Other: Political

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United States of America

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Texas

*Email*

**1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?**

The Federal Reserve's initiative to open a dialog regarding CBDC, and to reach out to the public for feedback, are encouraging steps forward. However, this dialog should expand its scope beyond CBDC, and include blockchain-powered currencies and assets, as a diversified, robust strategy to maintain and expand the global influence of the United States, and ensure our National Security and dominant global financial status. Specifically, the dialog should: I. Consider the potential of a public / private partnership with existing stable coins; II. Address in detail the CBDCs issued or developed by other governments, as a matter of National Security; III. Ensure that privacy considerations as well as impact of government monopoly imposed on the financial system are thoroughly addressed; IV. Leverage the extraordinary level of innovation and experience of the private sector, independent developers, Bitcoin miners, etc.; V. Include discussions around cryptocurrency regulations; regulations unfavorable to crypto will severely limit the ability of our nation to rely on a diversified portfolio of digital currency solutions.

**2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?**

According to the Federal Reserve's own language: "Today, the dollar is widely used across the globe because of the depth and liquidity of U.S. financial markets, the size and openness of the U.S. economy, and international trust in U.S. institutions and rule of law." So, the future solution beyond the dollar should be the one that further enhances our financial system and the openness of our economy. Such a solution can only arise from a diversified approach, reflecting the very openness and inclusiveness of our system, and not from embracing government monopoly. Furthermore, the decentralized nature of blockchain-based solutions such as Bitcoin will increase the competitiveness and stability of the US financial system by:

1. Providing assurances that the government will not interfere in private transactions; 2. Ensuring basic privacy rights; 3. Being invulnerable to attack from a single node. Historically, it seems like the choice has largely been between security/privacy or convenience/fungibility. CBDCs preserve convenience/fungibility while almost entirely removing security/privacy benefits. Bitcoin manages to provide both and is more viable in the long-term than a CBDC.

**3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?**

**4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?**

**5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?**

**6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?**

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22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

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*State*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Our answer to Q1 is online here:

[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:bp:q01:start](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:bp:q01:start) and answers to sub-questions: sub-Q1: Benefits -  
[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:bp:q01:benefits](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:bp:q01:benefits) sub-Q2: Policies -  
[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:bp:q01:policy](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:bp:q01:policy) sub-Q3: Risks -  
[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:bp:q01:risks](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:bp:q01:risks) Our full response to the discussion paper in .pdf format can be found here:  
[https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc\\_omg:omg\\_cbdc\\_response.pdf](https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc_omg:omg_cbdc_response.pdf)

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Our answer to Q2 is online here:

[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:bp:q02:start](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:bp:q02:start) Our full response to the discussion paper in .pdf format can be found here:  
[https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc\\_omg:omg\\_cbdc\\_response.pdf](https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc_omg:omg_cbdc_response.pdf)

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Our answer to Q3 is online here:

[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:bp:q03:start](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:bp:q03:start) Our full response to the discussion paper in .pdf format can be found here:  
[https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc\\_omg:omg\\_cbdc\\_response.pdf](https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc_omg:omg_cbdc_response.pdf)

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Our answer to Q4 is online here:

[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:bp:q04:start](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:bp:q04:start) Our full response to the discussion paper in .pdf format can be found here:  
[https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc\\_omg:omg\\_cbdc\\_response.pdf](https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc_omg:omg_cbdc_response.pdf)

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Our answer to Q5 is online here:

[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:bp:q05:start](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:bp:q05:start) Our full response to the discussion paper in .pdf format can be found here:  
[https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc\\_omg:omg\\_cbdc\\_response.pdf](https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc_omg:omg_cbdc_response.pdf)

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Our answer to Q6 is online here:

[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:brp:q06:start](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:brp:q06:start) Our full response to the discussion paper in .pdf format can be found here:  
[https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc\\_omg:omg\\_cbdc\\_response.pdf](https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc_omg:omg_cbdc_response.pdf)

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Our answer to Q7 is online here:

[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:brp:q07:start](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:brp:q07:start) Our full response to the discussion paper in .pdf format can be found here:  
[https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc\\_omg:omg\\_cbdc\\_response.pdf](https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc_omg:omg_cbdc_response.pdf)

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Our answer to Q8 is online here:

[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:brp:q08:start](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:brp:q08:start) Our full response to the discussion paper in .pdf format can be found here:  
[https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc\\_omg:omg\\_cbdc\\_response.pdf](https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc_omg:omg_cbdc_response.pdf)

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Our answer to Q9 is online here:

[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:brp:q09:start](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:brp:q09:start) Our full response to the discussion paper in .pdf format can be found here:  
[https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc\\_omg:omg\\_cbdc\\_response.pdf](https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc_omg:omg_cbdc_response.pdf)

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Our answer to Q10 is online here:

[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:brp:q10:start](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:brp:q10:start) Our full response to the discussion paper in .pdf format can be found here:  
[https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc\\_omg:omg\\_cbdc\\_response.pdf](https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc_omg:omg_cbdc_response.pdf)

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Our answer to Q11 is online here:

[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:brp:q11:start](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:brp:q11:start) and answers to sub-questions: sub-Q1: Risk of Software Crisis -  
[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:brp:q11:01\\_risk](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:brp:q11:01_risk) sub-Q2: Risk of Lack of Stakeholder Buy-In -  
[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:brp:q11:02\\_risks](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:brp:q11:02_risks) sub-Q3: Risk Due to Poor Community of Interest (CoI) Governance -  
[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:brp:q11:03\\_risks](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:brp:q11:03_risks) sub-Q4: Risk Due to lack of Broad, Wide Ranging Security Planning -  
[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:brp:q11:04\\_risks](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:brp:q11:04_risks) sub-Q5: Risk of Data being hacked due to weak Security Infrastructure -  
[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:brp:q11:05\\_risks](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:brp:q11:05_risks) sub-Q6: Risk of Meta-Data being hacked due to weak Security Infrastructure -  
[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:brp:q11:06\\_risks](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:brp:q11:06_risks) sub-Q7: Risk of Business Processes Being Hacked -  
[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:brp:q11:07\\_risks](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:brp:q11:07_risks) sub-Q8: Risk of competing Currency Models for the CBDC -  
[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:brp:q11:08\\_risks](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:brp:q11:08_risks) Our full response to the discussion paper in .pdf format can be found here:  
[https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc\\_omg:omg\\_cbdc\\_response.pdf](https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc_omg:omg_cbdc_response.pdf)

esponse.pdf

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Our answer to Q12 is online here:

[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:br:p:q12:start](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:br:p:q12:start) Our full response to the discussion paper in .pdf format can be found here:  
[https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc\\_omg:omg\\_cbdc\\_response.pdf](https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc_omg:omg_cbdc_response.pdf)

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Our answer to Q13 is online here:

[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:br:p:q13:start](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:br:p:q13:start) and answers to sub-questions: sub-Q1: How could a CBDC be designed to foster operational and cyber resiliency? -  
[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:br:p:q13:sub\\_01:start](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:br:p:q13:sub_01:start) sub-Q1 Part A:  
[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:br:p:q13:sub\\_01:prt\\_a:start](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:br:p:q13:sub_01:prt_a:start) sub-Q1 Part B:  
[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:br:p:q13:sub\\_01:prt\\_b:start](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:br:p:q13:sub_01:prt_b:start) sub-Q2: What operational or cyber risks might be unavoidable? -  
[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:br:p:q13:sub\\_02:start](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:br:p:q13:sub_02:start) Our full response to the discussion paper in .pdf format can be found here:  
[https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc\\_omg:omg\\_cbdc\\_response.pdf](https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc_omg:omg_cbdc_response.pdf)

*14. Should a CBDC be legal tender?*

Our answer to Q14 is online here:

[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:br:p:q14:start](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:br:p:q14:start) Our full response to the discussion paper in .pdf format can be found here:  
[https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc\\_omg:omg\\_cbdc\\_response.pdf](https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc_omg:omg_cbdc_response.pdf)

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Our answer to Q15 is online here:

[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:br:sn:q15:start](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:br:sn:q15:start) Our full response to the discussion paper in .pdf format can be found here:  
[https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc\\_omg:omg\\_cbdc\\_response.pdf](https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc_omg:omg_cbdc_response.pdf)

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Our answer to Q16 is online here:

[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:br:sn:q16:start](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:br:sn:q16:start) Our full response to the discussion paper in .pdf format can be found here:  
[https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc\\_omg:omg\\_cbdc\\_response.pdf](https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc_omg:omg_cbdc_response.pdf)

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Our answer to Q17 is online here:

[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:br:sn:q17:start](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:br:sn:q17:start) Our full response to the discussion paper in .pdf format can be found here:  
[https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc\\_omg:omg\\_cbdc\\_response.pdf](https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc_omg:omg_cbdc_response.pdf)

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Our answer to Q18 is online here:

[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:br:sn:q18:start](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:br:sn:q18:start) Our full response to the discussion paper in .pdf format can be found here:  
[https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc\\_omg:omg\\_cbdc\\_response.pdf](https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc_omg:omg_cbdc_response.pdf)

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Our answer to Q19 is online here:

[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:dsn:q19:start](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:dsn:q19:start) Our full response to the discussion paper in .pdf format can be found here:  
[https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc\\_omg:omg\\_cbdc\\_response.pdf](https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc_omg:omg_cbdc_response.pdf)

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Our answer to Q20 is online here:

[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:dsn:q20:start](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:dsn:q20:start) Our full response to the discussion paper in .pdf format can be found here:  
[https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc\\_omg:omg\\_cbdc\\_response.pdf](https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc_omg:omg_cbdc_response.pdf)

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Our answer to Q21 is online here:

[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:dsn:q21:start](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:dsn:q21:start) Our full response to the discussion paper in .pdf format can be found here:  
[https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc\\_omg:omg\\_cbdc\\_response.pdf](https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc_omg:omg_cbdc_response.pdf)

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Our answer to Q22 is online here:

[https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc\\_omg:04\\_doc:20\\_comments:dsn:q22:start](https://www.omgwiki.org/CBDC/doku.php?id=cbdc:public:cbdc_omg:04_doc:20_comments:dsn:q22:start) Our full response to the discussion paper in .pdf format can be found here:  
[https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc\\_omg:omg\\_cbdc\\_response.pdf](https://www.omgwiki.org/CBDC/lib/exe/fetch.php?media=cbdc:public:cbdc_omg:omg_cbdc_response.pdf)

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*Name or Organization*

WTIA Cascadia Blockchain Council

*Industry*

Trade Organization

*Country*

United States of America

*State*

Washington

*Email*

arry@washingtontechnology.org

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Several additional considerations need to be addressed that have not been in this paper:- How does credit work in the U.S. CBDC? - Is the goal to open up transparency to the people?- What's the ledger?- Who has control and governance over it?- Will it be or not be permissionless?- What sits behind the digital dollar/CBDC?- Will it be interchangeable with other dollars? - Will the CBDC be separate and distinct from what we know today in 2022 as the U.S. - Dollar? - Will individual people be able to hold the CBDC?- How will it empower the market to flourish?We would also like to highlight several inconsistencies between industry standards and the assumptions and definitions within this paper. These include:- In the paper, in the section “Identity-verified: Financial institutions in the United States are subject to robust rules that are designed to combat money laundering and the financing of terrorism. A CBDC would need to be designed to comply with these rules. In practice, this would mean that a CBDC intermediary would need to verify the identity of a person accessing CBDC, just as banks and other financial institutions currently verify the identities of their customers.” → This is not necessarily accurate, since even in the current system, individuals can use physical cash without verifying their identity.- In the sentence, “Cryptocurrencies have not been widely adopted as a means of payment in the United States. They remain subject to extreme price volatility, are difficult to use without service providers, and have severe limitations on transaction throughput.” → The last clause is no longer true, as many blockchains have advanced their protocols and are now significantly advanced in terms of transaction throughput.- In the sentence, “A CBDC would be the safest digital asset available to the general public, with no associated credit or liquidity risk.” → The statement reflects more of an opinion. CBDCs are essentially code or software, so credit or liquidity risk depends on the monetary policies that are written into the digital program. This also depends on how safety is defined.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

The answer to this question is dependent on the goals the federal government has for a CBDC. For example, is the goal of the CBDC to open up transparency to the people? What is the tone being sought through a Fed CBDC? The nature of the goals dictate the nature of the potential benefits.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

A CBDC can affect financial inclusion. It could potentially help create a common, open platform for people to interact with the financial systems. However, these potential benefits depends on some specifics: - Will physical cash exist in the future with a CBDC? - Who is allowed to have a CBDC account? - Who is not allowed to have a CBDC account? - As mentioned above, is the CBDC interchangeable with other dollars and/or other foreign currencies? - Who can hold the currency or the CBDC? - What is the basis for derivative U.S. Dollar instruments? - Are CBDCs held as currency in a bank? Generally banks get their capita from bank deposits from people. - How does credit work with CBDCs?

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

To meet the stated goals for the Federal Reserve, a U.S. CBDC would need to be

implemented in a way that limits the ability to inflate. We suggest using an algorithmic constrained inflation model. If everyone can see the supply of U.S. dollars, and a predictable fixed level of “printing” of U.S. dollars, then inflation of the monetary supply would be predictable and transparent. If the U.S. CBDC is a “base layer” protocol that powers regional/alternative currencies that are also pegged to an asset, then the U.S. CBDC would be backed with the assets of the United States. This would create an auditable track for creating an algorithmic approach for divisibility and transferability. It would enable collateralized debt which would be ideal for a CBDC.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

See answer to question #4 for more details. Algorithms, transparency, and publicly known factors on how the CBDC operates will enable stability through software code. We view stability as predictability. Unknowns in monetary and fiscal policies create instability. We would encourage the Fed to embrace monetary and fiscal policies that are transparent and take an asset-based/collateralized approach. A CBDC would enable hyper dollarization - within the global economy, the result would be mixed, while within the US economy, there would be increasing stability as the dollar is enshrined as the world's reserve currency. In the short term however, there would be great disruption, as the standard financial intermediation mechanisms could be easily replaced.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

The current derivative market would be affected dramatically. CBDCs would potentially limit the banks' ability to issue the current derivatives. Questions: - How does credit work in an environment when people are incentivized to hold their CBDC with a bank? - Can people open CBDC accounts directly with the Fed? A CBDC “upsets the table” far more than stablecoins or non-bank money, purely on scale alone. For example, the challenge of Diem/Libra pales to the reach that a CBDC would have. Stablecoins have limits on their reach and applicability that would not apply to a CBDC - they are privately issued money. Depending on design, they rely on some combination of the full faith and credit of the institution and network effects. The government would not have such limits. bonds.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

To mitigate any adverse impact of CBDC on the financial sector: - A measured rollout would be very important, focused on the high-priority use cases like taxes. The U.S. CBDC should act as a base layer for US dollar assets issued by other companies. - The Federal Reserve should not have to do this as technology and CBDCs are not its strength or expertise. Let other financial companies use the U.S. CBDC as collateral for US assets. Competition is helpful to the financial sector, and even more helpful with practical regulation (like enabling telecommunications to be implemented in rural areas in the country). In order for the U.S. dollar to compete effectively in the future world of finance, it should take advantage of similar tools as the best stablecoins in the market. A slower rollout or design of a U.S. CBDC that maintains the traditional pyramidal structure of the deployment of money would both protect the financial sector and diminish the benefits of the U.S. CBDC - there needs to be a clear plan for rolling out that cannot be influenced by external factors.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes, it is important to preserve the use of a public option because it is the ultimate lever of financial access and inclusion. Without such access, individuals would no longer possess the same opportunities they currently do with cash. The Fed should serve the public first and the banks second. People should be able to hold the CBDC. Continue to empower the use of Mastercard, Visa, etc., who already settle in digital currency. Empower the private sector and Fintech companies to solve market needs by making things more easy and accessible. If Fintechs could access the CBDC rails, then it greatly increases accessibility not just in the U.S. but globally. It would preserve general public access and world access to interesting financial products, which would be hugely beneficial.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

In absence of a formal U.S. CBDC, we already have alternatives with known and unknown risks. For example, Tether, also known as USDT. This trend is likely to continue. Domestic

payments in the US will continue to bandage over the bank centric model, instead of creating a truly level playing field for all participants. Banks must be exposed to competition in a fair way. For cross-border payments, the current system of *nostro/vostro* accounts would likely continue in the near term, with the addition of some crypto layer for facilitation and tracking. A stablecoin payment is not settlement, nor are any of the stablecoin providers likely to be large enough to facilitate exchanges broadly. That said, the wide availability of CBDCs would create a far more liquid and available market for currencies, especially with direct swaps or accessibility to accounts in foreign countries.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The U.S. dollar is the most exported product globally from the United States. Every nation around the world, and every person in the world, would gladly trade in their particular nation's currency for the U.S. dollar if they could, and easily. Being digital makes it easier for that to happen. If we don't innovate the U.S. dollar and keep it globally accessible, it could threaten our largest global product. Other nations will attempt to go around the U.S. dollar. The U.S. should take note that other nations' efforts to establish their own CBDCs, often with the goal of implementing policies and surveillance on their populations, will ultimately lead to lack of global adoption. The U.S. should not "overplay its hand" as the currently global reserve currency, which requires keeping implementation simple.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Other ways to manage potential risks associated with a CBDC that were not raised: - What is the appropriate entity to manage the U.S. CBDC? - Is the Federal Reserve the appropriate entity to issue CBDC? - Does the issuing agency operate with sufficient political independence? - Does this hurt competition in banking? What is the role of the bank in the CBDC system? - Will the CBDC be a totally new currency that is separate from the U.S. dollar?

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

A CBDC could provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity. We already have a working technology that provides zero-knowledge cryptography. Additionally, privacy can happen at another level outside of the base layer that we suggest makes most sense for a U.S. CBDC to inhabit - in other derivative products - or on higher levels, for example. We suggest the Fed assess the pseudonymity provided on the Bitcoin blockchain. It provides a balance between privacy and transaction tracing. There is still the opportunity for a "dark" or unknown account to interact with an account where someone has provided their information, but once a dark account transacts with a known account, law enforcement can get data from the known account owner. The system inherently keeps criminals away from law-abiding citizens while providing privacy when needed.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

A CBDC could be designed to foster operational and cyber resiliency. They may want to consider: - Key holding and recovery should be dependent on the customer support organization, not the federal government or built into the protocol directly. - How do you build multisig into the system - It should be built upon modern cryptography and digital key schemas. There should also be regulated competition. Allowing for competition forces the CBDC to be at least as secure as privately established blockchains.

*14. Should a CBDC be legal tender?*

Yes - a CBDC should be legal tender, in all ways indistinguishable from cash or bank money. This is very important not only for taxation and government operations, but also for investing.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

A CBDC should not pay interest. Paying interest while a CBDC circulates does not make sense, as it would remove an incentive to use it as a payment method. Interest payments should be left to financial organizations, for example, that match lenders and borrowers and provide a risk adjusted return. It does not make sense for the Fed to take over this function. However, a CBDC that is time locked or loaned should pay interest - the providers of

services with CBDC should be allowed to perform maturity transformation as is common within the current economy to enable credit.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

The amount of CBDC held by a single end user should not be subject to quantity limits. Within a properly designed CBDC, there would be sufficient traceability that a quantity limit would not be warranted. Imposing a quantity limit would limit economic freedom and be counterintuitive to the goal of a CBDC.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Intermediaries for the U.S. CBDC should: - Be a retail bank or regulated bank entity - this could include payment providers or gateways and other kinds of service providers. - Maintain an auditable record and provide sufficient data security. - Have the ability to make credit. - Have a supported customer service unit. The requirements for becoming an intermediary should be as low as possible to help increase the adoption of the U.S. CBDC.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes, the U.S. CBDC should have offline capabilities, particularly if it is replacing the physical cash we have today. A possible mechanism for achieving this could be a near-field communication key system (such as the NFC process used for Apple Pay or credit card tap functions) that enables transactions when one party is offline.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes, the U.S. CBDC should be designed to maximize ease of use and acceptance at the point of sale. Ease of use is an important factor in ensuring acceptance and broader adoption of the U.S. CBDC. To achieve this, there are a few things to consider: - Lower the barrier of entry, anyone can adopt CBDC payment or become CBDC intermediaries (ideally permission-less at certain degree) - Mobile payment (pay and accept payment) by default - Make it extremely easy to integrate with existing platforms and systems

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

A U.S CBDC should be designed to achieve transferability across multiple payment platforms, which is why we suggest that the U.S. CBDC would make most sense as a base layer protocol. The U.S CBDC itself should be self-contained, and the transferability across multiple payment platforms is achieved by "Gateway" or "Bridge" components (reference to the cross-chain bridges architecture). The bridge/gateway "translates" protocols and technical standards between different platforms, thus there will be little or no new technical standard needed. Transferability is incredibly important for any CBDC - bridges or gateways create credit or exchange relationships that impact the fungibility of a CBDC. One way would be to run a series of gateways that are owned by the government or nominated financial institutions at zero cost and zero profit, using tokens designed by the government on each platform. There would be a standard known process for implementation. Additionally, any mechanism should regulate what can be claimed as a stablecoin on a higher layer of the CBDC. This could be done with a single account issuing all digital currency on top of the base U.S. CBDC layer.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Future technological innovations can affect the design and policy choices related to the U.S. CBDC. - Making the information auditable/transparent. - Have a known inflation rate. - Have a predictable inflation rate (known algorithm). To ensure a smoother transition to a U.S. CBDC, any changes to the established system should take into account identity and data property rights, real-time currency conversion and markets, and enable a native token within all kinds of networks and regions.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Several more design principles should be considered. First, a system like this should be

simple - do a single thing, and do it well. In this case, the focus of the U.S. CBDC should be on all transmission/transactions of federally-backed U.S. dollars, including internationally (i.e. reduce cost by replacing ACH, Swift, etc). Then the system, in order to enable more features, should be modular and extensible, using common APIs, for an ecosystem to develop. The system should also be updateable. Additionally, a U.S. CBDC should embrace citizen-centric schema(s) that supports a broad system, utilizing public keys, that allows for establishing an identity, similar to the current system with bank accounts. - One example is to use the social security number as a public key and then have a separate issuer of a different private key. Such a system would require a kind of local registration option, but would reduce the potential for identity theft. - Such a system would also allow for application of CBDCs outside of the U.S. enabling a market ecosystem to grow on top of the U.S. CBDC. - Focus on building a standard protocol and framework, so different implementations are possible and scalable.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Google LLC (“Google”) respectfully submits these comments to the Board of Governors of the Federal Reserve System (“Federal Reserve”) regarding its report on “Money and Payments: The U.S. Dollar in the Age of Digital Transformation.” Google supports the exploration of Central Bank Digital Currencies (CBDCs) as foundational for the future of money. We believe that CBDCs could help promote open, interoperable, low cost, inclusive, accessible and increasingly automated financial services systems. The potential for programmability and for micropayments may also create the foundations for new business models. Critically, any CBDC must navigate the technology and policy issues surrounding privacy protection, proper regulatory and law enforcement, interoperability, cybersecurity and resilience. We see our role as providing technical and research perspective supporting central banks and the broader ecosystem should governments decide to move forward with launching a CBDC. We want to contribute to the open source community seeking to build the next generation of Internet design and applications. In particular, we are focusing our efforts on two areas of expertise - large-scale infrastructure and consumer user experiences, including safety, security, accessibility and privacy. In addition to participating in discussions with central banks around the world, we are also engaging the academic research community through partnership with MIT’s Digital Currency Initiative, which seeks to explore the different aspects of CBDC by working with both technologists and user researchers. Google supports the creation of inclusive and open digital payments systems that are available to all market participants and end-users in the economy. Our comments in this submission are based on Google’s experience in developing new technologies and facilitating payments technology across Cloud, Android Platform, and Google Pay. These comments discuss our ongoing research around digital currency designs and how they might affect the use, adoption, and user experience for a range of different technology products, plus key questions about the design of policy tradeoffs that might arise. Please find below comments in response to several of the specific questions that the Federal Reserve posed in the CBDC Report. We have not addressed all questions as we believe that there are other market participants who may be better placed to answer the more policy-related questions, and have focused on the questions which have technical implications. We also appreciate that many of these are complex and multi-dimensional and would be happy to meet to discuss any areas of interest in more detail.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve’s ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?

7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?

8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?

9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?

10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?

11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?

The two additional risk management areas that we believe merit additional exploration are adoption risk and operational cost risk. There are two issues which are potentially major contributors to digital currency adoption risk which itself is worth considering. The contributors are around retail availability characteristics and retail privacy expectations. Historically, consumer products which act unreliable create stress for the user and lead to disuse. Digital currency which is dependent on constant Internet connectivity and an intermediary service provider will introduce unreliability into the user experience. For instance, uncertainty around the success of a retail user's transaction with a vendor in a subway station or at a rural farmer's market may lead them to prefer other forms of payment. The other major contributor to adoption risk is anticipated to be uncertainty around privacy characteristics. It will be necessary to provide clarity around what information will be shared with merchants, third parties and governments for each transaction rather than have the details emerge over time. To that end, it will be valuable to explore the contributors to adoption risk from a user impact perspective, whether it is clearer privacy controls and communication or addressing availability challenges of intermediated transactions. Beyond adoption risks, operational costs and scalability will be impacted by the interaction model of the digital currency. If transactions always prefer using an online intermediary, then disconnected operation (direct transfer between participants) may be exercised less frequently and may not perform as desired when the functionality is needed. If it is online intermediated-only, then availability and processing latency will be critical to merchant throughput. Low latency, high transaction-per-second systems with high availability requirements will carry with them higher operational costs. It is worth exploring disconnected-first, or direct exchange, models to determine if the transaction risk inherent in an offline, or direct, transaction can be ameliorated in a more cost effective way than the operational costs from an online system.

12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?

The implementation of a CBDC system can ensure that illicit financial activity can be limited while still providing appropriate privacy guarantees to consumers, which support necessary trust in the monetary system. Below we highlight some examples of concrete tradeoffs or solutions that could be explored. At the simplest, a CBDC system may provide privacy while effectively limiting the potential for illicit financial activity by segmenting transactions by amount. When transactions exceed a regulatory threshold, they must provide some form of additional disclosure. For transactions below that threshold, privacy guarantees may be made. This approach would increase government oversight beyond what is in place for physical cash today, while only reducing privacy for money movement that is already subject to reporting requirements. It may also be possible to enact further constraints on transactions, but the tradeoffs in availability and privacy would need to be considered. Another path worth investigating, which, however, may compromise availability, would be to require per-transaction authorizations with embedded transaction limits and expirations. A rolling transaction limit can then be enacted over a specific time period, especially if the authorizations take the form of a single use cryptographic token which carries traceability information discoverable upon abuse. However, if a user runs out of authorizations they may

not be able to transact until their next authorization is valid. Additionally, this approach does not address the impact of multiple wallets per-end user. To further restrict usage would likely require a privacy tradeoff which connects end users to their wallets. This model would need further exploration to assess the importance of these different dimensions. Another possible direction would be limited traceability through transaction metadata, such as time and location. This may enable pre-existing approaches to be reusable for responding to illicit activity through existing practices, subject to legal process. Beyond these approaches, there are other models where recent advances in cryptography would enable legal compliance, security, and different privacy guarantees than have been explored so far. An approach based on these advances could rely on specific properties of currency storage and transfer conjoined with a final proof of compliance, which provides strong privacy guarantees. In that class of approach, offline re-spendability of currency could be enabled simply by requiring a specific zero knowledge cryptographic proof. It is expected that these mechanisms could restrict illicit behaviors. There are even approaches where party and counterparty information is encoded in a transaction but not shared globally. In this approach either participant may reveal the counterparty in a transaction, or if flagged at some point in the future, required to do so in order to reuse the funds. Each approach will require a deeper, cross-disciplinary investigation to better understand the benefits and risks of each and guide the exact design.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

A CBDC design should ensure that the resulting system is able to maintain desired transaction throughput even under high load as well as provide continuity of service and consistent outcomes in the event of network partitioning. It should also be able to separate the minting of currency from the currency in circulation such that compromises across the system, internally or externally, do not result in the injection of new currency. Similarly, any offline-enabling solutions should avoid enabling wallet devices to create new value and instead be required to re-spend and leave an evidentiary trail that enables conflict detection and resolution upon settlement. Operational risks will be a function of the design choices that are made – where some design choices create intrinsic risk that cannot be compensated for in the future while others may be adapted iteratively. For example, an online-only CBDC may avoid any double-spending, but limit system availability. On the other hand, if the system is designed for high-availability, it may introduce risks for counterfeiting/over-spending. Similarly, a CBDC designed with strong traceability characteristics will likely come with strong privacy risks. However, awareness of the spectrum of risks enables the CBDC system to be designed to balance abuse and availability – potentially even actively using controls deployed throughout the system.

*14. Should a CBDC be legal tender?*

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Without the ability to perform disconnected operations, CBDC use may be impossible or unreliable in regions with limited or disrupted connectivity, those with high network congestion, or during natural disasters and emergencies. Additionally, the operational costs of a real-time payment/settlement system scale on transaction volume not deposits and withdrawals as with physical cash. As such, it is expected that disconnected operation will be important for operational availability and scaling, as well as financial inclusion. Enabling “offline”, or disconnected operation, implies increased risk of abuse in the resulting partitioned networks – namely via “double spending” of currency or balances. Addressing this risk may be achieved proactively through technology solutions and reactively through risk management mechanisms: Proactive solutions may rely on secure hardware features to protect cryptographic keys and storage while also enforcing specific transaction protocol behaviors. Using a combination of server-granted privileges, through cryptographic signing, and secure hardware, it is possible to enable transaction-time policies and secure transfer of funds between devices. (In most cases, a token-style model provides a clearer path for enabling offline transactions and preserving transactional privacy, but it is possible to tokenize

account models as needed.) Reactively, the outputs of transactions when settled online should provide the serving system the ability to detect double spending and enable accountability for any security failures which allowed it. It is worth noting that existing secure hardware technology can provide a suitable foundation to enable offline operation. However, many existing secure hardware solutions are proprietary and closed systems. Even with laboratory validation, such as Common Criteria, it may be desirable to have any secure hardware solutions acting as the platform for fiat currency be transparent and broadly verifiable. Transparency will necessitate open source software and hardware. Verifiability will range from formal correctness proofs over the software and hardware to verifiable supply chains. Achieving high levels of both will require additional investment in the space. Additionally, the development of new technology will be necessary over time. For example, the creation of verifiable hardware circuits would enable new approaches for addressing double spending, further improving the resilience of a disconnected system.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

A CBDC should be defined to ensure ease of adoption across payment platforms to maximize the benefits possible from their interoperability and connectedness over the Internet. It may be worth viewing the CBDC design itself as new technology, even if its underpinnings are not. As such, new standards will be needed as there isn't an existing broadly applicable standard. By defining a broadly accepted set of standards, it should better ensure the security and operational expectations of the underpinnings of the CBDC system into the future.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

While the Federal Reserve identifies many of the potential benefits and risks associated with developing a CBDC in its report: Money and Payments: The U.S. Dollar in the Age of Digital Transformation (the “CBDC Report”), it understates two critical policy considerations: the impact that a CBDC could have on bank functions, and the existence of currently available private sector solutions that offer the same benefits as a CBDC, without the attendant risks. As the CBDC Report recognizes, there is a clear need to modernize our nation’s payment system. Today, American businesses have limited options for transmitting funds to one another, even when they have accounts at the same bank, and many of the options currently available are slow, inefficient, operate on restricted schedules, and can be expensive. While it is encouraging that the Federal Reserve has committed to 24x7x365 real time payments, the FedNow payment system is still over a year away and there are several significant risks associated with the development of a CBDC. Most significantly, the development of a CBDC could pose systematic risks to our national banking system, which is already facing serious threats from emerging fintechs and other nonbanks that issue stablecoins and other innovative, but un- or underregulated financial products. Since 2008, there has been a 40% decline in the number of mid-sized and community banks and most mid-sized and community banks do not have the resources to keep up with the tech advancements of fintech challengers and megabanks. The development of a CBDC is likely to exacerbate the risks currently facing these banks. Even if a CBDC is intermediated by financial institutions, it will still necessarily displace commercial bank money and could drain deposits (including introducing potential run risk) by offering a competing product that will be transmissible on a peer-to-peer basis. Furthermore, it may severely diminish the critically important role that U.S. commercial banks, especially community banks, play in allocating capital to the small and medium sized businesses. These banks are engines for economic growth and job creation in this country. Implementing a CBDC may be unnecessary given the ability of private sector innovation to provide the same benefits. Private sector innovators like Tassat are already providing banks and their customers the ability to facilitate secure, instantaneous, and programmable blockchain-based payments around the clock, which make U.S. banks more effective in serving their customers and bring tremendous benefits and efficiencies to U.S. companies of all sizes. The strength of the U.S. economy is based on a dynamic and innovative private sector, made possible by a diverse and strong banking system. At the core of our banking system are small and mid-sized banks that often have deep relationships with their customers, serve a diverse array of customers and businesses, and are deeply invested in their communities. The federal government should adopt policies that allow these banks to thrive. As currently conceived, the introduction of a CBDC runs the risk of undercutting the important role that banks play in our economy rather than supporting banks to better serve their customers and in turn, our economy. A far better path would be to allow technological innovation by the U.S. private sector to empower American banks, thereby extending and deepening one of the great strengths of the U.S. economy: its banking system.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes. The potential benefits of a CBDC are currently available to banks and their commercial customers using existing private sector payment innovations. Leveraging and promoting existing private-sector payment innovations is preferable to launching a CBDC for several

reasons. Creating a CBDC will require a significant undertaking from the Federal Reserve, and it is unclear when a potential CBDC would become operational. The Federal Reserve began its examination of a real time payments system in 2013, committed to building the FedNow payment system in 2019, and its anticipated launch is in 2023, a decade later. Not only would it take years to study a CBDC prototype, obtain Congressional approval, and then build the platform and scale it, it will take a significant amount of resources to overhaul the current payment infrastructure to accommodate a potential CBDC. This would include banks expending significant resources to adapt their systems to facilitate the use of a CBDC, which could lead to less near-term adoption of private sector solutions. By the time a CBDC solution is implemented, technological innovation is likely to have made it outmoded. In the meantime, there are private sector solutions available today, and being implemented today, which can achieve and even surpass the benefits envisioned with CBDC without any of the drawbacks and risks involved with CBDC. Private sector innovations are nimble and can adapt more quickly than the Federal Reserve. These innovations incorporate leading-edge technology into service offerings, allowing businesses and others to benefit from the latest technology today, as opposed to waiting years for the Federal Reserve to implement technology. In fact, private sector payment innovations are already having an impact on improving efficiencies in payments. Some of these innovations use blockchain technology between groups of financial institutions to facilitate payments, such as R3's platform and JP Morgan's Liink, and other instant payment solutions like RTP. Tassat Group ("Tassat") is one such private sector innovator. Tassat was founded in 2017 to provide American banks with the tools to compete in an increasingly digital economy. Tassat has developed proven technology allowing banks to modernize by harnessing the benefits of private, permissioned, blockchains within the regulatory perimeter of the U.S. banking system to facilitate secure, instantaneous payments. TassatPay is an intrabank solution to provide customers with real-time, 24x7x365, business-to-business payments without preset transaction size or volume. Through its use of blockchain technology, Tassat's technology enables use of smart contracts and delivery-versus-payment settlement. TassatPay is delivered directly to bank clients via either a user interface or API, which means the bank is integrated directly into the client's treasury management system, allowing banks to deliver both secure, real-time payments 24x7x365 and Fedwire capability in one place. Tassat's technology is compatible with legacy banking systems, allowing member banks to give clients access to the latest innovations without having to redesign or fully upgrade their systems. These types of features enable banks to capture an increasing share of a client's banking activity. It is also affordable for all banks large and small. To date, Tassat's technology has facilitated over \$400 billion in instantaneous, secure blockchain-based payments between current bank customers. Most importantly, Tassat's technology allows banks to continue to use commercial bank money and has resulted in increased deposits and bank growth and therefore does not pose the attendant risks of a CBDC, stablecoins, or cryptocurrencies, which threaten to drain banks of deposits. Soon, Tassat's payments technology will be used by the bank-owned Digital Interbank Network, permitting customers of participating banks to make payments with each other using a secure, permissioned blockchain. Currently available private sector payment options strengthen banks and lead to internal growth by using commercial bank money, a form of money that is familiar to most individuals and that has reduced credit and liquidity risk when compared with alternative payment solutions.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Yes. A CBDC could adversely impact the financial sector by changing the financial sector market structure, decreasing the safety and stability of the financial system, and creating vulnerabilities in operational resilience and cybersecurity. With respect to changes in the financial sector market structure, the CBDC Report states that features such as paying interest and instantaneous transferability could lead to decreased bank deposits, which would affect a core function that banks provide - lending. Consumers rely on borrowing to finance homes, cars, and other large purchases, while small business owners rely on borrowing to run their businesses. According to the Independent Community Bankers Association,

community banks provide 60% of all small business loans and make more than 80% of agricultural loans. A CBDC that is quickly and easily converted from bank deposits would mean decreasing the amount of funds available for lending, and this would increase the costs of borrowing. An interest-bearing CBDC would be even more detrimental by competing with assets considered to be safe, such as Treasury bills and money market mutual funds. Not only would this further increase the challenges consumers and businesses face in borrowing, but an interest-bearing feature would compete directly with products offered by commercial banks. As the Federal Reserve states in the CBDC Report, a CBDC should “complement, rather than replace, current forms of money and methods for providing financial services.” Less money circulating through the banking system could also lead to the potential destabilization of the financial system if demand for a potential CBDC is high. The CBDC Report provides that the Federal Reserve may need to substantially expand its holdings of securities to meet market demand for a CBDC, which would make reserves more sensitive to market developments. A CBDC would be subject to many of the same operational and cybersecurity risks as existing payment services but would actually be less defensible because more entry points would exist, compared to existing payment services. This long list of serious risks posed by a CBDC begs the question as to whether any of the potential benefits could outweigh them. The nation’s current payment system has benefited greatly from innovations developed by and competition within the private sector that do not carry with them the same types of systemic risks to the nation’s financial system. Tassat has seen firsthand the positive effects that the blockchain-based payments innovation has had on increased bank growth and overall deposits.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

One way the Federal Reserve could mitigate some of the systemic risks posed by CBDC is by limiting CBDC access and transferability to regulated entities within the intermediated financial system, essentially limiting its use for wholesale purposes rather than retail, so that consumers and commercial entities would continue to use forms of money such as commercial bank money but still benefit from the technological upgrade that a CBDC could provide. There are a number of private sector innovations, including TassatPay, that currently provide many of the same benefits of a CBDC, such as speed and low cost, but without the risk of disintermediation, which would expose consumers and businesses to the cybersecurity and operational risks of a CBDC, and disruption of the financial sector.

*8. If cash usage declines, is it important to preserve the general public’s access to a form of central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Many countries that are considering issuing a CBDC are defined by far more centralized financial systems than our own, with private sectors that lack the dynamism and innovation emblematic of the American economy. The adoption of a CBDC in these countries is likely to make their financial systems and economies even more centralized and further reduce innovation.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*
17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*
18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*
19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*
20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*
21. *How might future technological innovations affect design and policy choices related to CBDC?*
22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Digital payments made with a U.S. CBDC can be less expensive, more efficient, and more fraud-resistant than cash, credit, or debit card payments. In fact, the primary risk related to CBDCs is in not pursuing the development of one, and instead allowing foreign jurisdictions the opportunity.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Implementing a CBDC to achieve widespread adoption and utility (versus existing money and stablecoin assets) requires building a “minimum viable” digital asset that attempts to replicate cash functionality as closely as possible, and resists building in additional functionality that would complicate integration. In all cases, this means designing a CBDC to be as standardized, interoperable, and simple in its functionality as possible.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

A U.S. CBDC would likely have a net positive effect on financial inclusion. Empirical evidence has shown that inclusive financial systems are an important component to economic and social progress across all demographics. As the predominant form of payments in the United States, payment cards are already inaccessible to many U.S. citizens who are un- or under-banked. If designed to be deployed through intermediaries that include regulated nonbank financial service providers, a U.S. CBDC could be as exchangeable and transferable as cash while providing many of the conveniences and other benefits of payment cards and other forms of digital payments.

*4. How might a U.S. CBDC affect the Federal Reserve’s ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

A U.S. CBDC should be designed to operate along the same levers as cash in the U.S. financial markets, and should therefore offer the Federal Reserve similar controls toward achieving its desired monetary policy.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

A U.S. CBDC would likely affect financial stability in a positive way, by allowing transactions to process faster and more efficiently while providing less exposure to fraud. Further, CBDCs would provide for greater access to commerce at lower costs, promoting financial stability and inclusion on a broader scale.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

If designed to function as simply and generically as possible, a U.S. CBDC should only enhance the ability of the financial sector to adapt to a shifting landscape of financial exchange. In essence, by providing a U.S. CBDC, the Federal Reserve enables U.S.

businesses and individuals the ability to conduct commercial transactions with confidence online and in whatever other digital ecosystems may arrive in the future.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Our investigation continues.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes. If cash usage declines because of a broad shift toward digital payments, it becomes more imperative for the Federal Reserve to issue a U.S. CBDC that can offer equivalent functionality in a digital context.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

In the absence of an “official” U.S. CBDC, private enterprise will continue to develop substitute products to fill its place. These substitute products may develop into private monopolies on commercial activity that the Federal Reserve would otherwise like to avoid.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Decisions by other large economy nations should not influence the Federal Reserve’s decision to issue a CBDC. Put another way, the issuance of CBDCs around the world is already much of a foregone conclusion; the US should decide to issue a CBDC based on the merits of the technology and opportunities for innovation and financial inclusion that it represents.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

The “Money and Payments” paper largely tasked existing frameworks and established solutions with addressing the potential risks of a CBDC solution, and this is the ideal strategy.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

A U.S. CBDC should explicitly not embed any functionality that would enable transactions to become personally identifiable outside of separate databases maintained by the CBDC’s designated intermediaries. The existing framework of rules that are designed to combat money laundering and the financing of terrorism are sufficient for preventing such a CBDC from being used to facilitate illicit activity.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

A U.S. CBDC should consider existing blockchain networks as templates for operational and cyber resiliency, and preferably be deployed across as many such blockchain networks and distributed ledgers as possible.

*14. Should a CBDC be legal tender?*

Yes. A CBDC should be legal tender, because otherwise the inherent benefits of a CBDC would not be realized. A CBDC should be considered as exchangeable as cash within the U.S. financial system.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

No. To maximize the utility and adoption of a U.S. CBDC, such a CBDC should not embed mechanisms that complicate its integration into existing commercial frameworks. An ideal design would allow a U.S. CBDC to substitute for cash in as many settings as possible.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

No. Placing an arbitrary constraint on the amount of CBDC that can be held by a single end-user would impose additional overhead obligations on intermediaries that could

compromise the Federal Reserve's stated goal of protecting consumer privacy, and would explicitly restrict the adoption of such a CBDC.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

The intermediary types identified in the "Money and Payments" paper—namely, commercial banks and regulated nonbank financial service providers—are the appropriate types of firms to serve as intermediaries for the U.S. CBDC and could be considered in the roles of issuers, transmitters, or redemption providers. The OCC, FinCEN, and various state authorities offer existing and established frameworks for the oversight of money transmission—whether cash or CBDC-based—that fulfill the obligations of the Bank Secrecy Act.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

No—at least, not initially. The current state of development toward offline support for digital asset transactions is promising, but a consensus-driven approach has not been established. The U.S. CBDC should be launched in a "minimum viable" form while offline transaction support strategies are being explored, and consider implementing "offline" capabilities once a leading strategy is established and the end-user need becomes more clear.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

No—at least, not initially. The current state of development toward offline support for digital asset transactions is promising, but a consensus-driven approach has not been established. The U.S. CBDC should be launched in a "minimum viable" form while offline transaction support strategies are being explored, and consider implementing "offline" capabilities once a leading strategy is established and the end-user need becomes more clear.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

If a U.S. CBDC was implemented as a digital asset, in the way that many U.S. dollar–pegged stablecoins are issued today, then it benefits from being deployed across as many blockchains as possible (e.g., Ethereum, Solana, Avalanche). This so-called "multi-chain" support would enable a CBDC to adapt to additional networks or payment platforms as they are developed in the future and would aid adoption via seamless integration into existing digital asset platforms and ecosystems.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

The future of technological innovations in the realm of digital asset value transfer is difficult to predict. A U.S. CBDC benefits from being designed as simply and generically as possible, which will support its ability to withstand and adapt to technological advancements and shifts.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

The design principles identified by the Federal Reserve (privacy-protected, intermediated, widely transferable, and identity-verified) are well considered. However, the principle of a CBDC being "widely transferable" instead of "universally transferable" or "interoperable" stands in conflict with the theorized benefit of supporting the dollar's international role. Just as US dollar cash carries value with and can be held by individuals, entities, and financial institutions outside the purview of the U.S. government, a U.S. CBDC would benefit from being universally transferable as a digital asset on open blockchains, even beyond the network of U.S. CBDC "intermediaries" and beyond the point at which the Federal Reserve or these intermediaries can verify the identity of end-users who are not U.S.-based. Any attempt to limit the transferability of such a CBDC by way of a permissioned ledger or inbuilt identification mechanism would inherently limit its performance against the goal of being privacy-protecting and the theorized benefit of supporting the dollar's international role.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The discussion paper does not adequately describe the privacy risks created by current third-party payment systems and thus does not adequately describe the necessary legal, regulatory, and technological architecture that would be necessary to establish a privacy-protective CBDC. The discussion paper does acknowledge that an intermediated digital currency would present similar privacy risks to the current payment system: Consumer privacy: A general-purpose CBDC would generate data about users' financial transactions in the same ways that commercial bank and nonbank money generates such data today. In the intermediated CBDC model that the Federal Reserve would consider, intermediaries would address privacy concerns by leveraging existing tools. But the discussion paper does not explain the invasive data collection that pervades the current payment ecosystem. At this moment when the Federal Reserve is researching and considering alternatives that could improve payment systems, the Board should take the opportunity to consider what legal, regulatory, and technological changes would actually improve financial privacy for individuals. The report should include a close review of current data collection and use practices in the banking, payment, and fintech sectors and recommend changes that would establish much needed privacy protections for individuals. The current system for both physical point of sale and online payments is under-regulated and subjects individuals to voluminous financial surveillance. Credit cards, online transactions, and point-of-sale systems all have access to detailed records of individuals' financial transactions, and many of the entities operating these systems are either selling this personal data to brokers, or they act as brokers themselves. Currently, large data sets of credit and debit card transactions are available for purchase to almost anyone. A search on the bulk dataset aggregator Datarade returned 35 separate datasets offering individual credit or debit card transactions for sale, and 234 total data sets offering transaction data including bank-to-bank transactions, electronic payment transactions, and loyalty card data. The widespread dissemination of this data poses substantial privacy risks because this type of transaction data is easy to de-anonymize. In 2015 a study found that metadata from just four transactions in a dataset was enough to identify the cardholder in 90% of cases. Current payment systems are designed to enable data brokers to collect, aggregate, and sell consumer data, and we do not have legal or regulatory privacy protections to protect against abuse. The widespread brokering of financial transaction data can cause substantial harms to individuals. Brokers that collect or purchase transaction data can use it to build detailed profiles of individuals that can reveal or be used to infer private information about them, including their political views, their religious beliefs, their reproductive and family choices, and their personal preferences and habits. These data can also be used to underpin consequential decisions about where an individual can work, live, or even what price or level of service they receive. This pervasive profiling forces individuals into a "scored society" that frequently operates as a black box where they do not have access to the most basic information on how they are evaluated. Secret algorithms can be used to determine the interest rates on mortgages and credit cards, raise consumers' interest rates, or deny people jobs. For more information on black box algorithms, see the work of Frank Pasquale. And many times, algorithmic scoring does not create rational results. In one instance, a consumer found that his credit score suffered a forty-point hit simply because he requested accurate information about his mortgage. For more information see: EPIC, Data Brokers, <https://epic.org/issues/consumer-privacy/data-brokers/>, and EPIC, Screening and Scoring, <https://epic.org/issues/ai/screening-scoring/>. The widespread collection and use of transaction data also exacerbates risks of overbroad government surveillance. Law

enforcement agencies have reportedly begun to purchase bulk data from brokers in ways that can sidestep constitutional and statutory privacy protections. For example, Immigrations and Customs Enforcement (ICE) uses transaction data from utility payments to identify allegedly undocumented individuals for arrest and deportation, even when those individuals live in “sanctuary cities” that have opted not to provide information to the agency. Some of the data used by ICE uses was collected by credit reporting agency Equifax from another data broker holding more than 400 million utility records. Federal agencies have also had real-time access to credit card transaction data since at least 2010, creating risks of oversurveillance, wrongful arrest, and abuse. Continued in 2

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Continued from Question 1 For full comments with citations please see EPIC's website: <https://epic.org/documents/epic-comments-on-the-federal-reserve-discussion-paper-money-and-payments-in-the-digital-age/> Federal agencies have also had real-time access to credit card transaction data since at least 2010, creating risks of oversurveillance, wrongful arrest, and abuse. Access to credit card data can be obtained without a warrant. The current digital payments landscape is over-surveilled and under-regulated. Individuals are subject to private and corporate surveillance from payment services providers and data brokers. That data is used to monitor, evaluate, and score individuals through opaque algorithms, eliminating financial privacy and harming individuals' access to credit, housing, and jobs. Much of the same data is available to law enforcement with little oversight or protections against misuse. The Consumer Financial Protections Bureau is currently conducting an inquiry into data collection by big tech platforms that facilitate transactions including Google, Apple, Facebook, and Amazon. The Fed should join the CFPB in studying invasive payment monitoring practices by big tech companies that collect transaction data. Central Bank Digital Currency should not replicate the current system.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

For full comments with citations please see EPIC's website: <https://epic.org/documents/epic-comments-on-the-federal-reserve-discussion-paper-money-and-payments-in-the-digital-age/> The discussion paper lays out many options for managing the potential risks associated with CBDCs. However, we believe that the paper does not adequately address the risks posed by intermediary and third-party implementation of digital wallets. Recent developments in the fintech and cryptocurrency ecosystem have shown that

wallet services pose potentially substantial risks of data abuse, fraud, and other unfair practices if not adequately regulated. Malicious or improperly vetted wallet systems can exacerbate the problems of data aggregation, financial surveillance, and fraud. Implementing any new technology creates risks during the adoption period, when individuals are especially vulnerable to fraud and exploitation. And digital wallets pose unique risks because they expose individuals to commercial exploitation of personal transaction data as well as the risk of malicious third-party fraud, theft, or manipulation. Without close review prior to deployment and constant scrutiny following adoption, the software and systems used to facilitate payments via CBDCs could cause more harm than good. Rampant thefts and fraud in digital assets including cryptocurrency and Non-Fungible Tokens (NFTs) demonstrate the risks to consumers in implementing new and unregulated financial technologies. Digital wallets are currently used in cryptocurrency marketplaces, and associated transactions like the sale of NFTs. A recent study from Chainalysis found that more than \$3.2 billion in cryptocurrency was stolen in 2021, with the trend accelerating in 2022. While most of the largest thefts are accomplished by hacking cryptocurrency platforms, individuals are also widely vulnerable to fraud and theft. For example, in May 2022, hackers were able to spread fraudulent links across several popular NFT Discord channels, triggering automatic transfer of NFTs from unwitting users' digital wallets. These thefts take advantage of individuals unaware of how easily current digital wallets can be exploited. Expanding digital wallet use across the economy by adopting a CBDC will expose even more vulnerable individuals to potential thefts and fraud. Digital wallets then present serious security risks that need to be addressed before widespread adoption, especially if they are to hold CBDC funds. Digital wallets will have access to sensitive information and digital transactions, which inherently create detailed records unless designed to avoid them. Wallets apps will have access to users' personal information, banking information, and unless regulated could easily access phone location information as well. Because digital wallets will have to interact with both banks and point-of-sale devices, the wallet is a potential privacy vulnerability as the app could collect information on both sides of a transaction. Unscrupulous wallet developers will have a strong incentive to design wallets that maximize data collection and make that data available for sale to data brokers. And similar risks exist for point-of-sale systems, which will only provide transaction privacy if they are designed to do so. New laws, regulations, and thorough product-testing are necessary to protect privacy for digital currency transactions. The Federal Reserve should investigate the current marketplace for digital wallets and provide recommendations for the legislation, regulation, and product testing necessary to protect consumers if digital wallets are widely adopted. The following principles are a starting point:

- Data Minimization: digital wallet providers should be prohibited from collecting any data that is not strictly necessary to make the digital wallet work;
- o No Transaction Records: digital wallet providers should not be permitted to create and maintain records of transactions conducted using the wallet;
- o No Location Data: digital wallets should not be permitted to collect or store location data or to transmit it off the device holding the wallet;
- o No Data Exploitation: digital wallet providers should not be permitted to sell or transfer data collected from wallet users;
- Regulation: Congress should designate one agency to implement regulations for digital wallets;
- Product Testing: Congress should mandate that either the National Institute of Standards and Technology or a designated regulatory agency perform rigorous product tests on all digital wallet apps to ensure that the apps conform with the above principles.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

If the Federal Reserve moves forward with a digital currency, that currency should use a token-based system that does not rely on distributed ledger technology. The Fed should look to the work of cryptography and digital cash pioneer David Chaum for guidance in implementing a token-based CBDC. A token-based digital currency issued by the Federal Reserve would present several advantages. First, a token issued by the Federal Reserve could be incorporated into the current banking system, making it easier to adopt a CBDC. Second, it is possible to design a token that replicates the transaction privacy created by physical cash but also implements anti-money laundering protections. This type of CBDC would be a substantial improvement for consumer privacy as payment service providers would not be able to exploit transaction data. Third, by avoiding a distributed ledger system, a token issued by the Federal Reserve would have affordable transaction costs and be easy to scale up for public use. Fourth, tokens can be designed to expire and need to be refreshed after a certain amount of time, cutting down on currency hoarding and reducing the ability of a central bank to do long term financial surveillance. Expiration dates can ensure that a CBDC is mainly used for transactions. A token-based CBDC could work with existing intermediaries (banks) and would be able to preserve transaction privacy while allowing for anti-money laundering controls. To accomplish this, currency in the form of tokens would be issued by a central bank, transmitted to users through commercial banks, and encrypted and stored in a digital wallet. To spend the token, the user transmits it to a merchant, who deposits it with the

merchant's bank and then the central bank to verify it has not been used before ("double spent"). Using a public/private key pair, merchants can verify the validity of the token using the central bank's public key, but would not receive the payer's private key, maintaining payer anonymity. Similarly, because neither the commercial bank nor the central bank can see the token's unique identifier, a merchant depositing the coin with the central bank does not reveal the individual who withdrew it. Banks would still be able to implement anti-money laundering controls because merchants are identified and verified when their accounts are created. By limiting the amount of currency a merchant can receive in one transaction, and monitoring patterns of payment with merchants, banks and the central bank can conduct strong anti-money laundering activities without compromising privacy for payers. The Federal Reserve should look to the work of David Chaum to design a CBDC that improves privacy for digital transactions. The following publications are particularly relevant: - David Chaum, Christian Grothoff, Thomas Moser, *How to issue a central bank digital currency*, Schweizerische Nat. Bank (Mar. 2021), [https://www.snb.ch/n/mmr/reference/working\\_paper\\_2021\\_03/source/working\\_paper\\_2021\\_03.n.pdf](https://www.snb.ch/n/mmr/reference/working_paper_2021_03/source/working_paper_2021_03.n.pdf). - David Chaum, Amos Fiat, and Moni Naor, *Untraceable Electronic Cash (extended abstract)*, Advances in Cryptology CRYPTO '88, S. Goldwasser (Ed.), Springer-Verlag, pp. 319-327, [https://chaum.com/wp-content/uploads/2021/12/Untraceable\\_Electronic\\_Cash.pdf](https://chaum.com/wp-content/uploads/2021/12/Untraceable_Electronic_Cash.pdf). - David Chaum, *Privacy Protected Payments Unconditional Payer and/or Payee Untraceability*, SMART CARD 2000, <https://chaum.com/wp-content/uploads/2022/02/Privacy-protected-payments-unconditioanal...pdf>. In addition, the Federal Reserve should investigate fully anonymous digital currency and present fully anonymous currency as an option in future publications. The discussion paper discounts the possibility of implementing fully anonymous digital cash due to current anti-money laundering and anti-terrorism laws. However, developing a digital currency will be a long-term process that presents the opportunity to re-think the costs and benefits of those laws. Fully anonymous digital cash may present even greater benefits to privacy, consumer protection, and inclusion for currently unbanked individuals that should be explored. And the use of intermediaries to facilitate the use of CBDCs should make it possible to integrate an anonymous digital payment mechanism through the intermediary while complying with anti-money laundering and fraud regulations as the current system already does with cash deposits and withdrawals. The Fed should investigate and provide an option for fully anonymous digital cash to inform the discussion around CBDC design, and allow the public to weigh in on whether a fully anonymous digital currency is desirable. Conclusion EPIC urges the Federal Reserve to foreground privacy and consumer protection as key considerations in their review of digital currency proposals. Because a digital currency by itself will not solve equity, privacy, and fraud harms, the Fed should move slowly to ensure that it does not adopt or encourage use of systems that pose new and significant risks.

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

14. *Should a CBDC be legal tender?*

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

With most of the options presented, considerations must be given to controlling the flow of funds to or from the FRB to prevent major shocks to the financial infrastructure. If consumers were allowed to move large amounts of money very quickly it might cause some financial instability and develop a lack of trust of the system, resulting in low adoption by consumers.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Yes, a CBDC could adversely impact the financial sector if the framework is not well thought out and conducive to the existing structure of the financial sector. The CBDC should plug into the existing financial sector structure and utilize the existing ecosystem of financial institutions that can assist with maintaining a safe and secure payments delivery channel. Leveraging the existing financial structure provides the opportunity for a safer and more stable digital currency than other digital currencies offered by nonbanks.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

In today's banking model, the financial institution (FI) is the intermediary between the consumer and the Federal Reserve Bank (FRB). The deposits provide a source of liquidity to financial institutions, who then lend those deposit dollars out at a higher rate. The financial institution makes money on the difference of what it earns in interest income less what is paid out in cost of funds, known as net interest margin. That margin is used to cover the requirements to operate the financial institution and maintain compliance with the vast rules, regulations and laws including know your customer, anti-money laundering, bank secrecy, etc. To take away deposits from an FI and move them to the FRB removes an important source of liquidity for financial institutions. However, a tool to mitigate this is to consider changing the model to still include financial institutions as the intermediaries for CBDC. Moving those deposit dollars off of financial institution balance sheets and to the Federal Reserve Bank would mean that the FRB would have significant low-cost liquidity. The FRB then could loan out that liquidity to FIs at low rates. This lower rate could be set by market

rates less a set percentage determined to service those accounts as an intermediary. This would provide a low-cost liquidity source to FIs, and it would provide the margin needed to continue to service the accounts with the operating and compliance costs that are necessary. By the FRB not paying interest to consumers on the CBDC deposits, it still provides an incentive for financial institutions to provide higher interest bearing deposit accounts. In other words, on their balance sheet the FI would simply replace their transactional account balances with a borrowing, which would allow them to continue to earn their spread to pay for the operational expense. This practice of not paying interest on balances could diminish the attractiveness of CBDC as a digital currency if other digital currencies provide a return, and this account does not. However, those other digital currencies have risks associated with them. The CBDC would be considered a risk-free transactional payment option for the consumer, and therefore a return would not be expected.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Consumers might turn to other digital assets, such as stablecoins or other countries CBDC, to perform their monetary transaction for cross-border payments. Due to the lack of full regulatory insight into activities occurring in nonbanks it may contribute to money laundering or other fraudulent activities. To help mitigate these activities, it is important to develop a model of CBDC to help improve the process and reduce costs required by consumers and fully regulated financial institutions to perform these types of transactions. Further, to support a global economy it is very important for the US to work with other countries to create global standards to establish trust and a free-flowing digital currency across the globe.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

It is important for the US to maintain the position of trust and monetary strength in world markets. If the US opts to not pursue CBDC another country will establish themselves as leaders in this space and potentially cause the US to lose this position.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Yes, the existing banking structure that already has the operations, regulations, and expertise to manage and monitor accounts should be leveraged. There should be some compensation that goes back to the FI in exchange for their assistance in maintaining a safe and secure payment channel. This is similar to the way that VISA pays interchange to issuers to absorb processing costs and fraud losses in order to maintain a zero liability promise to their cardholders.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Similarly, as is done at FIs today, as long as the FI is still the intermediary for CBDC, they can continue to comply with the rules, regulations and laws around bank secrecy, anti-money laundering and know your customer. However, the FI must receive compensation in order to afford the operations required to maintain this compliance. This can be achieved in different ways, one is to provide a discount on liquidity, another is to receive a fee based on transaction volume to/from the CBDC. FIs can monitor transactions of money movement in and out of the CBDC payment channel but would not have the visibility to monitor transactions between digital currency accounts.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

One of the key elements of creating resiliency is to ensure there is diversity, therefore, if the current regulated financial institution's infrastructure is used it would use the current diversity that exists. The proposed direct model creates a more singular point of failure of the financial system and removes the ability to control the level of impact. In using the indirect model, it creates layers of defense and if a financial institution was compromised it would limit the impact to the scope of that financial institution, and not the overall monetary network. In a black swan event that resulted in CBDC to be unavailable, consumers and businesses would struggle to conduct transactions if the core functionality became unavailable. If there was

shared responsibility amongst financial institutions by using the indirect model, it helps mitigate the scope of impact to the economy by spreading the risk across multiple regulated financial institutions. Additionally, the use of blockchain technology would ensure cyber resiliency and trust in a digital currency.

*14. Should a CBDC be legal tender?*

It depends. If it is built as a secure, trusted, reliable and risk-free delivery channel that is regulated, then yes, a CBDC should be considered as good as cash.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

No, the CBDC should not pay interest. As a risk-free transactional account, there should not be an expectation that the account would bear interest. Likewise, to maintain a safe, secure, and risk-free payment channel takes operational costs. The FRB can leverage the thousands of financial institutions that already protect and monitor accounts and transactions to maintain a safe and secure payment channel and compensate them for this service. This will also allow financial institutions to maintain interest bearing accounts for liquidity purposes, and this payment channel would be priced to be not as attractive so that the majority of the liquidity remains in financial institutions.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

To ensure the safety and soundness of CBDC, intermediaries that follow the regulations of financial institutions should be allowed to participate in the CBDC network. Allowing intermediaries that do not fall under these regulations increases the risk to the overall ecosystem. The financial sector already has an ecosystem of financial institutions and regulators that have the operations to maintain security and monitor accounts. These financial institutions have the operations and expertise to be an effective intermediary for CBDC. The CBDC can be a product that complements an FIs existing deposit products, as opposed to competing against it.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes, to be a reliable and trusted payment source, a CBDC should have offline capabilities. This could be achieved similarly to the way VISA stands in today when systems are offline. It allows up to a maximum threshold to allow transactions to continue to flow without interruption. Under the indirect model, key financial institutions should hold offline copies and act in a stand-in capacity (requiring a majority transaction approval between institutions) until functionality and validity of the underlying CBDC is brought back online. This further stresses the need to implement the indirect model by taking advantage of the current financial infrastructure currently in existence. It should be evaluated to determine if a secure offline model can be supported at the POS/consumer level in the event there is a failure of technology or communications to facilitate transactions.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Acceptance of CBDC will be key if the intent is to obtain high adoption at the consumer level. It may be best to allow private companies to innovate and develop the interactions at the consumer level to provide the best experience. The CBDC should use an open standard to allow for this innovation to occur, with proper security requirement defined. In addition, there should be some merchant responsibility associated with this implementation to protect the overall ecosystem from beginning to end.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Current standards should be reviewed to determine if they are applicable to the development of CBDC. If it is determined that any new standards are required then the Request for Comments (RFC) process should be followed, and the FRB should seek involvement from public and private sectors on the development of new standards.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

The consumers' needs should be considered in the design of CBDC. A study should be conducted on what the consumer requires in order to have a high trust and adoption of this payment option. The consumers' experience with how they would handle disputes, and whether their funds are guaranteed up to a certain dollar amount should be considered. These design features centered around the consumer should be the differentiators that create loyalty and demand for CBDC.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

skip

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes. Adopting blockchain for the settlement of financial transactions would create the benefits of reducing settlement time, record keeping costs and capital requirements. We also strongly urge the Federal Reserve to study the benefits of blockchain in reducing the capital and liquidity requirements for banks and broker dealers. In addition, blockchain, as a record keeping system, will dramatically reduce the time and need for audits. More importantly, the banking regulators can give regulatory authority to banks to issue fiat backed stable coins in US dollars or other currencies. The stable coins could then be used as a functional substitute for a CBDC in a blockchain based financial network. Allowing US banks to also issue stablecoins in foreign currencies could simplify and speed the settlement of cross border transactions for US based companies who are now very dependent on the SWIFT system where settlement times can take days and even weeks. Lastly, bank issued stable coins provide a safer and possibly intermediate step in assessing the risks and benefits of a digital finance system.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Yes, impact is of course possible both ways. Difficult to tell a priori. Pro: could break current monopolies. Con: could enable other kinds of consumer abuse. CBDC could greatly increase financial inclusion, depending on its design. It could allow for instantaneous access to funds whether paychecks or government stimulus. Another opportunity is frictionless cross border payments and remittances. However, depending on whether the CBDC design is account based, or direct vs indirect, may affect whether the unbanked population has access to this new digital currency. One way to increase financial inclusion through this new digital currency would be to provide digital wallets to anyone who requests them. Currently, US citizens can purchase US Treasuries on the US Treasury website. This website could be modified to allow citizens to apply for their own digital wallet. Other adjustments could be made to the website to satisfy KYC requirements. The digital wallet could be designed to hold solely CBDC or CBDC and other tokens. Its purpose could be further expanded to hold financial and health records as well. One important record keeping process in need of dire repair are social security records and personal identity. Designing a system that automatically downloads income history and other records to a person's wallet would allow the individual to compare his or her records with centralized government records for accuracy. Lastly, organizations like the Department of Motor Vehicles or US Post Offices could be other entities to provide wallets.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

The tools for monetary policy are limited and have proven to be rather blunt instruments in managing a complex and dynamic economic system. These tools include only quantitative easing or tightening along with interest rate adjustments. However, the Federal Reserve has

no tools to precisely target specific segments of the economy, industries, geographic regions or populations. Congressional policy helps, but can be untimely. The solution rests in the Federal Reserve's ability to identify supply and demand imbalances in industries or regions that are creating price instability and adjust those imbalances. CBDC has the potential for providing more options for monetary policy levers targeting specific problems. We understand that a CBDC might also provide additional modes of failure as well. Discussions around programmable money have been floated by various groups as a possibility. This idea is intriguing and worthy of exploration.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

skip

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Potential adverse effects of CBDC: New failure modes (outages, cyber threats, etc.) Dollarization of other economies, if US CBDC more widely adopted than current USD Potential inadequacy of existing compliance/enforcement mechanisms Facilitating new types of fraud Undermining existing payment methods, particularly cash Harming either privacy or the perception of privacy Either helping or hurting undocumented economic activity that has unexpectedly systemic importance Disintermediation: CBDCs issued without consideration for current depository financial institutions risk disintermediating the two-tiered banking system. Research suggests that the credit issuing capacity of commercial banks is vital to stimulating economic growth. Removing commercial banks from this function may result in destabilizing monetary distribution channels, resulting in uneven distributions of capital into the economy. New category of flight to safety potentially reduces the velocity of money at inopportune times Differences of CBDC from stablecoins: CBDCs can leverage trust in central banks to avoid some of the engineering complexity of decentralized "trustless" systems CBDCs don't pose the same solvency risk as stablecoins Unlike CBDC, stablecoins present added risks, including loss-of-value risks via stablecoin runs or fire sales, lack of a consistent set of regulatory standards, on top of traditional payment system risks, such as credit risk, liquidity risk, operational risk, and settlement risk.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

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*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

As society becomes more digital, governments should have a financial instrument that can offer similar benefits of cash while capitalizing on the growing trend of electronic payments. This includes offline payments, low transaction fees and preserving the anonymity of cash.

We believe this is one of the most important considerations actually because whether or not cash is an option impacts financial inclusion, privacy, and the ability to implement novel programmability into the CBDC. Cash usage declining affects heavily unbanked people, who are often paid in cash or with a check that they need to cash at a financial institution. Banks will not maintain offices/ATMs if the cost of having them filled and operating (which includes armored cars to bring the cash to different locations, security, etc) is larger than the benefit they are getting from them. Therefore they will likely keep the offices/ATM machines in the places where the offices/ATMs will have more use (e.g. center of a city) which will be very far from the places where low income people live. Therefore, a CBDC should foresee these developments and allow unbanked people to hold it.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

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*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

US should take a more globalistic, and less nationalistic, view of CBDCs. This way we can co-influence some of the design choices made around interoperability, privacy, security and scalability. They are great learning experiments. The US should monitor closely and see what has gone wrong and right.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

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*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

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*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

skip

*14. Should a CBDC be legal tender?*

Yes since it should be seen as a substitute for cash. A CBDC should be an acceptable form of payment for general obligations, including retail transactions, wholesale transactions, taxes, debt settling etc.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

A CBDC should have the capability to pay positive interest or charge negative interest, but except under extraordinary circumstances, the expectation should be a zero nominal interest rate no different from cash. In particular, CBDCs must not compete with commercial bank deposits or reduce demand for interest-bearing financial instruments, unless doing so is an explicit (and likely temporary) goal of monetary policy.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

skip

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Many firms! This would allow access to CBDCs more widely which could decrease risk, offer more variability in what CBDCs can be used towards, and potentially increase financial inclusion via widespread usage. Key is issuance (Central Bank) versus distribution (multiple entities including banks) A CBDC solution should NOT disintermediate a two tier banking system. Commercial banks should still own the relationship with the customer and play the role of distributing liquidity into the general economy.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes this can help with better access and financial inclusion of individuals in emerging markets or situations where there is limited internet connectivity (i.e. natural disaster) Offline transactions help with operational continuity and resilience and then you can truly then say that CBDCs can be a substitute for physical cash, since physical cash can be used offline, so should CBDCs.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

No. A CBDC should be designed to serve as a lowest layer in a multi-layer systems, where third parties implement higher layer functionality such as point of sale systems. To ensure innovation, it is important that the CBDC not overly constrain the design of point-of-sale systems by hard-coding design choices into the CBDC itself. Analogy: IPv6 should not be designed to maximize ease of use and acceptance of email, web, streaming video or any other specific service. Specifically, a baselayer CBDC system should be created to allow for other, newer, use-cases to be built upon it and tailored for each use. Further, over-engineering specific uses now ossifies the system and leaves it open to obsolescence in a short time.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

The challenge in interoperating with existing payment arrangements will depend on new

system designs, but most have standardized mechanisms to make inter-account transactions. Support of both traditional and emerging financial standards (e.g. ISO-20022, SWIFT, NACHA), will likely play a part in enabling interoperability with other payment systems. There will also need to be portability of funds between different intermediaries and customers so that no one user or funds are locked up.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

-Creating an open, lowest layer CBDC system today with as much functionality and interoperability now as it can have will likely help ensure such openness and support of new technological advances that need to plug in and to interoperate in 20 years' time. Making sure a system is technically capable of supporting new technological advances today, therefore, helps (though does not ensure) that it can be future-proofed against the new technology and use-cases of tomorrow. -Emerging technology already in the "pipeline" at research labs that we predict to be 5, 10, 20 years out can also influence current design choices. For example, quantum resistant cryptography as a design choice is influenced by the threat of quantum supremacy by hostile nation-states. Breakthroughs in lowered energy consumption and heightened throughput can and should also be considered in CBDC design. Further work towards ubiquitous digital identity systems or technology also have design and policy considerations affecting CBDCs.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

We believe that any US CBDC should be guided by three high-level principles: 1. Embrace market-based solutions and the competition of ideas. In particular: 1a) When negative externalities arise, the Federal Reserve should directly charge, in dollars, for behavior that negatively impacts the financial system, and not place ad hoc restrictions on the use of digital dollars. For example, if CBDC holdings begin to put pressure on the fractional reserve banking system, the fed should charge negative interest rates, rather than limit who can hold digital dollars or placing arbitrary caps on account balances. 1b) CBDCs must not be imposed on people, but should be forced to compete with existing forms of money, including a long-term commitment to supporting physical cash. Even highly appealing technology can morph into a burden when users have no alternative and there is no feedback mechanism by which the design process can react to lost users. 1c) CBDCs should provide the Federal Reserve with more fine-grained levers with which to continuously monitor the economy and fine-tune economic policy. 2. Provide egalitarian, self-serve access to CBDCs, so that all citizens are in a position to innovate and there are few gatekeepers to digital money. 3. Similar to the architecture of the Internet, follow the end-to-end principle in system design: When functionality can either be implemented natively by the CBDC or effectively layered on top (closer to end users) by third parties, prefer the layered approach. The core CBDC functionality will be the most difficult to update, and may not be well-suited to properly capturing all the requirements of as-yet unanticipated applications. The CBDC should provide only the lowest layer functionality necessary for effectively implementing higher-level applications.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Please see our comment submitted by electronic mail to digital-innovations@frb.gov

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

*13. How could a CBDC be designed to foster operational and cyber resiliency? What*

*operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

This is an extremely important question and has not received enough in-depth investigation. The challenges in answering this question are twofold: First, we must have a set of specific, concrete (though hypothetical) US CBDC designs to compare against, and we do not. Oftentimes when people claim that CBDC would achieve a benefit or cause a specific problem they are considering one design (which they have not well-articulated) and are not considering the fact that there is a tremendous amount of parametrization and choice to be made in CBDC design. Second, a lot depends on exactly which benefits we are aiming to achieve, and the underlying reasons why these benefits are challenging to achieve today. For example, a goal might be to lower transaction costs; some measurements show retail transaction costs in the US are on the order of hundreds of billions of dollars a year. Answering the question of how one might reduce transaction costs would require a study to determine if these costs are due to issues like high fees from lack of competition, costs of complying with regulation, or costs in managing risks like fraud. Depending on where the issues lie, different interventions can be imagined to address them (some might be designs for various types of CBDCs, some not). These potential interventions should be considered and measured. Then all of these different goals and means of addressing them should be considered in aggregate: It might be the case that one intervention might address multiple goals simultaneously. There is one possible goal that can only be addressed by a CBDC, by definition: providing a public option for payments as payments move increasingly into the digital realm.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Our work found that uncertainty surrounding financial transactions emerged as the least-addressed and most-persistent pain point for Americans. To the extent that a CBDC could address this issue, it could be beneficial for financial inclusion. A CBDC could help -- it could provide fast transaction settlement and well-understood fees, reducing uncertainty. Note that if it is difficult to access a CBDC or requires onerous identity checks, it will help less with financial inclusion. More can be found in our research report titled "Centering Users in the Design of Digital Currency".

[https://www.maidenlabs.org/\\_files/ugd/93b65a\\_242f6839b55a4a80a752b986b39a62e3.pdf](https://www.maidenlabs.org/_files/ugd/93b65a_242f6839b55a4a80a752b986b39a62e3.pdf)

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

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*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

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8. *If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

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14. *Should a CBDC be legal tender?*

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

In order to maximize the potential of CBDC for financial inclusion and as a platform for innovation, individuals should be allowed to, if they desire, self-custody CBDC. It is unlikely most users will choose to do this, but the existence as an option means it will be easier to enforce interoperability, portability, and user choice. A broad set of intermediaries should be allowed to provide services using CBDC, and they should be regulated according to the roles and responsibilities they take on, along with the accordant risk. For example, an intermediary that custodies funds on behalf of users should be regulated differently than an intermediary that provides cryptographic key sharing or backup services, and cannot actually move or spend a user's funds. Requiring intermediaries for custody might affect the ability of an asset to truly act as a liability of the Federal Reserve. During times of stress or correlated failure, a user would have no mechanism for taking their CBDC outside of what might be an entirely failing intermediary system, and a user's CBDC might become "stuck" as their failing custodian goes through bankruptcy proceedings and their balance sheet is unwound. CBDC would need to be designed carefully so that users can not only take their CBDC out of an intermediary quickly, cheaply, and easily, but that there is also another non-failing, adequate intermediary to use instead. Having a proliferation of intermediaries, and even letting users, if necessary, be their own intermediaries (self-custody), seems to be the easiest way to achieve this.

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes, a CBDC should have offline capabilities to best approximate cash as a payment technology. This will likely be achieved through a combination of secure hardware on smart cards and cryptographic designs to limit the possibility of double spends. Relying on secure hardware introduces new risks, including the risk of a compromise in the secure hardware's supply chain. This is not insurmountable, but requires careful analysis and design.

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

The paper states that a CBDC should be intermediated and identity-verified. Unfortunately, posing these requirements, especially at this stage of US CBDC development, is premature. First, these are not well-defined terms. Intermediation can happen at many points in transacting: gaining access to the transaction system (receiving a payment), custodizing funds, writing and releasing wallet software, or even processing transactions. These are all distinct functions that come with different risks. Exactly which functions is the paper suggesting should be intermediated? Note that the US does not have a universal digital identity system, and is not likely to have a widely-adopted one in the next few years. Requiring identity documents of CBDC users would be in contrast to the design of digital cash. Would people who do not have identity documents be prevented from using the CBDC at all? If it's the same level of identity verification and intermediation as the existing banking system, then this likely reduces the potential for CBDC to help with reduced transaction costs and financial inclusion. Determining that "financial institutions in the United States are subject to robust rules that are designed to combat money laundering and the financing of terrorism. A CBDC would need to be designed to comply with these rules" is premature. The rules apply to financial institutions, and a CBDC would be a financial asset. The architecture of a CBDC would need to be able to withstand changes in regulation and should not "bake in" rules that might or might not apply to a wide variety of institutions and users that might hold the CBDC. If CBDC is not being held by financial institutions (for example if it is being transacted in small amounts in a peer-to-peer fashion) it should not be subject to the same rules. In fact, doing so might eliminate potential benefits like financial inclusion and reduced costs.

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**1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?**

"Money and Payments: The U.S. Dollar in the Age of Digital Transformation" provides a comprehensive high-level assessment of the opportunities and challenges associated with the deployment of a CBDC including the public-private boundary between the activities of the Board of Governors of the Federal Reserve (the Fed) and the private sector. That said, the Payments Leadership Council would like to highlight some items of importance that PLC members would recommend the Fed explore in greater depth.

**Risk and Challenges** Commercial incentive: Consideration must be given to whether all firms will be mandated to offer CBDC accounts. The absence of a mandate may create obstacles to ensuring universal access.

**Implementation:** The PLC believes that there are several implementation issues that should be addressed in order to create the appropriate framework to mitigate and balance the risks identified by the Fed and ensure a level playing field for all participants.

Should the Fed develop a CBDC, it is important to:

- Clearly articulate the CBDC use case, market applicability, scaled development, and overall goals before engaging in any potential activities.
- Ensure the CBDC's interoperability with existing national and international payments systems and compatibility with existing acceptance infrastructure.
- Outline where friction may lie within the current payment and financial systems and how the deployment of a CBDC would alleviate existing friction or challenges.
- Identify potential market disruption and build a detailed plan to mitigate disruption.
- Engage the private sector throughout the development of a CBDC. The payments industry has the expertise and experience in building effective and equitable payments networks and can provide strong resources for the federal government as it considers a range of modernization tools and techniques.
- Support an open and competitive marketplace that spurs innovation and fosters investment into the payment technologies of tomorrow. The Fed should explore a structure that ensures the ability for private market participants to compete fairly in order to effectively serve consumers and that positions the central bank as the operator of strategic activities such as minting tokens.
- Investigate the development of a robust risk management framework able to embrace the complex architecture of modernized payments systems. The Federal Reserve should protect users and private and public payment infrastructure by prioritizing cybersecurity and privacy to the same minimum standards as the world's leading payment networks of today.
- Explore additional innovative payments systems and tools to see how other modernization efforts may compare to a CBDC.
- Create a regulatory framework that further expands the existing open and competitive payments systems in the U.S. and boosts international competitiveness.

**2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?**

In the U.S. today, consumers can choose to pay by cash, card, account-to-account transfer, or through other digital payments. To provide value to consumers, a CBDC must have the same ease of use and accessibility as current payment methods and allow for consumer choice at the point of sale. Deployment of a CBDC is not a prerequisite to innovation. New capabilities can be delivered via upgrades to existing payments infrastructure or through the construction of new infrastructure that does not expand consumers' access to central bank money. The core factor that could distinguish a CBDC from any other retail payment system is the central bank's ability to provide an absolute guarantee on its liabilities. It is critical to understand that the most important and differentiated feature of a retail CBDC is the creation of a new form of public money. The ability to create a new form of public money is a distinct power available only to the Fed and Treasury.

**3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for**

*inclusion?*

Some people continue to rely on cash for most, or all, of their payment activities. These constituencies include individuals who are unbanked or underbanked, a subset of elderly individuals, and a small proportion of individuals disinclined to use electronic payments for legitimate reasons (for example due to a preference for the full anonymity offered by cash transactions). Continuing to meet the needs of these individuals falls within the Fed's mandate to facilitate efficient payments; however, it is not clear that a CBDC would resolve the underlying issues faced by underbanked individuals, including financial literacy and the ability to access banking services, and it seems very unlikely that it would meet the needs of those unable or unwilling to use digital payment systems. Building an inclusive economy means promoting financial literacy and security and ensuring all small businesses can grow. Existing digital payment systems help foster financial inclusion and expand access to new opportunities, but it remains unclear whether a CBDC is better suited than other digital payment offerings to support financial inclusion. The elements critical to unlocking increased financial inclusion within the U.S. are largely tertiary to increasing the availability of central bank money and creating a new set of payment rails. Therefore, if the Fed believes financial inclusion is a key rationale for a CBDC, the PLC believes that further study is needed to demonstrate a link between underlying issues and a CBDC's ability to solve them.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

PLC members concur with the Fed's evaluation that "the potential for significant foreign demand for CBDC ...would further complicate monetary policy implementation" with potential implications for credit supply, bank lending, and even financial sector stability. As such, it will be critical for the Fed to carefully examine the suitability of circulation (such as quantity limits or tiered remuneration), ensuring that the transmission of monetary policy would not be affected by shifts of large amounts of commercial bank money to holdings of digital dollar. There are a range of policy tools the Fed can use to ensure that a digital dollar does not undermine the U.S.' financial stability goals either in the course of its regular operations or during a crisis. For instance:

- Limiting the absolute quantity of flows and adjusting the desirability of holding digital dollars through a price mechanism. While further study of this issue is clearly required, it appears that each of these mechanisms has its own strengths and weaknesses. Limits have the advantage of being easily understood by users and, if set at a reasonable level, have little or no impact on consumer usability. At the same time, they provide commercial banks with a strong understanding of their potential exposure to deposit outflows. While a range of technical issues might need to be addressed—for example how inbound payments that would exceed a user's limit should be handled—these challenges appear tractable, particularly if addressed at the design stage.
- Alternately, the Fed could influence the desirability of holding a digital dollar by adjusting its rate of remuneration—either on the entirety of a user's holdings or at different rates across two or more balance 'tiers.' While this approach would provide the Fed with greater discretion, some commentators have expressed concerns that this approach may not be enough to halt a 'digital bank run' during financial crisis. Moreover, the use of highly negative rates to constrain deposit substitution during a crisis could face significant popular and political opposition. Ultimately, it is the view of the PLC that the design of any digital dollar should provide the Fed with the capacity to both impose limits and adjust remunerations across a variety of dimensions. Further study will be required to understand the best application of these tools. If the Fed chooses to move forward with the piloting and deployment of a digital dollar, the PLC would suggest the following actions to improve collective understanding of the risks of deposit substitution and the appropriate use of policy tools to mitigate those risks:
- Developing a scenario-based analysis of the operational, macro-economic, and financial stability impacts of a CBDC that include a broad range of calibrations for the rate of user uptake and the degree of commercial deposit substitution;
- Carefully analyzing, where possible, user behavior data from CBDC pilots and production deployments in comparable economies;
- Conducting live controlled-access pilots of large scale, breadth, duration, and complexity (including the involvement of multiple supervised private intermediaries) in order to more effectively model consumer behavior towards CBDCs, as well as the policy levers that would permit the Bank to influence the rate of deposit substitution.

It is important to note that most central banks appear to have determined that the additional functionality offered by a CBDC is likely marginal in contrast to existing mechanisms from a purely monetary policy perspective. U.S. CARES disbursements, for example, revealed that the current financial system is equipped to disburse funds to end-users. Issues with CARES disbursements had to do with fairly limited access to identity and account detail pairings, not the speed of the payment system or the nature of the money being moved. Additionally, some have asserted a CBDC system would enable easier "helicopter drops" (i.e., the term coined by Milton Friedman in his 1969 paper, "The Optimum Quantity of Money," that has since been used to refer to a monetary stimulus strategy that increases the quantity of money supply and distributes cash directly to the public). These commonly discussed narratives, however, assume universal (rather than opt-in) participation in the CBDC system.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for*

*stability?*

The economic changes arising from a shift to real-time retail payments are well documented and include: • A move away from an informal economy; • Increased working capital for businesses; • Improvements in the efficiency and cost of the financial system; • Expanded financial inclusion. There are now jurisdictions all over the world that have real-time or near-instant payments. Most of these operate on a deferred settlement basis with one or two having or planning 24/7 settlement of retail payments. The ability to reliably settle interbank obligations using balances at the central bank or in central bank money is vital not only to the smooth functioning of the payment system but also to financial stability more broadly. However, it is important to note that there are a variety of approaches the Fed can take to mitigate the impact of the challenges on financial stability with the introduction of a CBDC. More on these approaches are highlighted in the response to question four.

**6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?**

PLC members believe that all efforts to drive payment innovation should be guided by the following high-level principles: • Provide strong consumer protection, including privacy and security of the consumers' data and transactions; • Deliver a level playing field that ensures all stakeholders—including but not limited to financial institutions, merchants, and mobile network operators—have the ability to contribute to and benefit from the introduction of a CBDC; • Ensure future innovations interoperate with the domestic payment infrastructure and international payments networks to enable the design of products that offer consumers greater flexibility, choice, and reach; • Ensure future innovations are reliable, resilient, and secure so they can support large volumes of transactions and be available 24/7; and • Operate in full compliance with all applicable laws and regulations, including those applicable to anti-money laundering, and consistent with the economic systems of the markets the network/blockchain operates in. Within this context, stablecoins represent a fascinating and fast-moving area of innovation. Alongside a number of other payment mechanisms, well managed and adequately supported stablecoin projects have the potential to introduce improvements in a user's payment experience and expanded payment functionality—such as increased programmability of payments. That being said, it is important to recognize that the underlying structure of a fully collateralized stablecoin is functionally similar to that of an e-money provider, a view that is shared by the UK's Financial Conduct Authority in its guidance on crypto assets. A stablecoin would not benefit from the explicit guarantee enjoyed by a CBDC and would not offer the interest income and other benefits typically associated with commercial bank deposits. Moreover, from the perspective of a central bank, stablecoins would constitute a new variant of commercial money, and thus would not address any concerns that the Fed may have regarding the implications of declining cash usage (addressed in detail in our response to question eight). As such, it is our view that, while stablecoins could potentially add value to the U.S. payments ecosystem, they should not be viewed as a substitute to a CBDC, particularly with regard to ensuring consumers' continued access to central bank money.

**7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?**

There is a range of policy tools the Fed can implement to ensure that a digital dollar does not undermine U.S. financial stability goals either in the course of its regular operations or during a crisis (addressed in detail in the response to question four).

**8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?**

Cash usage is in natural decline but will remain a viable option for consumer payments for the foreseeable future. The rise of electronic and contactless payments has significantly expanded the array of payment options available to consumers, and the benefits of these options has contributed to a natural decline in the use of cash. For consumers there is little or no distinction between cash (central bank money) and deposits (commercial bank money); the two are easily interchangeable and both are readily accessible and available. Consumer choice in a payment method is determined by ease of use, acceptance by the merchant and/or other benefits or incentives. Consumers do not choose a payment method based on the distinction between central bank money and commercial bank money. The same principles should apply to the use of CBDC and electronic payments. As outlined in the response to question 3, some people continue to rely on cash for most, or all, of their payment activities. It is clear that continuing to meet the needs of these individuals falls within the Fed's mandate to facilitate efficient payments; however, it is not clear that a CBDC would resolve the underlying issues faced by underbanked individuals, and it seems very unlikely that it would meet the needs of those unable or unwilling to use digital payment systems.

**9. How might domestic and cross-border digital payments evolve in the absence of a U.S.**

## **CBDC?**

Absent the existence of a CBDC, the domestic payments landscape is likely to be characterized by the same vibrant competition and world-leading innovation that has defined the past several decades. The desirability of the dollar as an international reserve and trade settlement asset is driven by an array of factors including the depth and breadth of the treasury market, the U.S. legal system, the absence of capital controls, the sophistication of the U.S. financial system, and more. Over the longer term, the absence of a tokenized form of the U.S. dollar could limit its capacity to natively interoperate with other tokenized assets, most notably foreign wholesale CBDCs and wholesale CBDC platforms (e.g., Dunbar, M-Bridge, etc.).

### *10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

See our response to question nine above. In general, development and implementation should only begin once a specific use-case and well-defined objectives have been articulated and agreed upon.

### *11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

**Cross-Border Spillover:** In its October 2020 "Report on a digital euro," the European Central Bank notes that international spillovers of a digital euro could have serious unintended consequences on third-party economies, potentially driving the substitution of domestic money and amplifying "the real and financial cross-border spillovers of domestic monetary policy shocks by creating a new channel for their propagation." The bank expressed concerns that the unintended negative macroeconomic consequences of such spillovers would be disproportionately borne by smaller, less developed and less financially stable economies. The ECB has thus asserted that mechanisms will need to be established that "limit the scope of users of the digital euro when necessary—for example to exclude some non-euro area users." The same may prove true if a U.S. CBDC is introduced. Further study is required to identify and develop the correct policy tools to mitigate these spillover effects, however, it is clear some form of policy for controlling the size of non-U.S. digital dollar holdings would be necessary. **Counterfeiting And Double Spending:** Effectively mitigating the risk of counterfeiting and double spending for a digital dollar would require consideration across a number of dimensions:

- **Governance:** A two-tiered CBDC design, alongside a strong regulatory framework to provide and enforce operating rules and standards, would ensure that the central bank retains institutional governance and control over the core CBDC infrastructure—enabling it to implement and maintain strong protections against counterfeiting or double spend.
- **Technology:** Appropriate technology can support a digital dollar that provides traceability and proof of central bank issuance via cryptographical evidence. These technologies could ensure immediate reconciliation, immutability, and auditability through cryptographic guarantees. Additionally, given the Fed's consideration of a digital dollar that supports offline transactions, the ability to create a secure bearer instrument that facilitates transactions while eliminating the risk of double-spend will be required.

### *12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

The design of any digital dollar should capitalize on the complementary capabilities of both the Fed and the private sector. A 'two-tier' or 'platform' model would provide a secure, fast, and resilient technology environment that avoids the unnecessary expense of parallel infrastructure and ensures that compliance requirements remain primarily with industry. This approach would ensure that the Fed retains institutional governance over core monetary infrastructure, while relying on private sector competition to drive innovation, efficiency, and a diversity of offerings. Under a 'two-tier' approach, the private sector could support the digital dollar in a variety of ways, including, but not limited to:

- **Customer Identification:** Financial institutions and other regulated intermediaries are well positioned to onboard new users (e.g. sign-up, KYC, funding of accounts, etc.), conduct ongoing AML/CFT monitoring, and provide user education.
- **Privacy:** PLC members believe that digital dollar transactions should be subject to the same KYC and AML obligations as all other electronic payments, and that the requirements on the flow of payments data for AML and CTF monitoring apply equally to digital dollar transactions. In addition to well-established existing privacy tools, a host of emerging technologies have the potential to offer even greater levels of user privacy without undermining the objectives of existing compliance regimes. These include:
- **Zero-knowledge proofs (ZKP)** guarantee that customers have sufficient tokens without revealing the balance to merchants.
- **Shamir Secret Sharing (SSS)** reveals data details only if a pre-defined majority of nodes agree.
- **Multi Party Computation (MPC)** supports wallet infrastructure where private keys reside across multiple locations and supports data processing (e.g. AML/KYC) while keeping details private.
- **Anonymization techniques**, such as differential privacy, prevent consumer's personal data from being identifiable within large datasets.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Protecting all U.S. payments networks is more important than ever as digital payments and technology play an increasingly critical role in the broader economy. The introduction of any new payments service or product involves risk assessment inherent in design and requires ongoing monitoring and evaluation once the service is launched. Should the Fed decide to move forward with the creation of a CBDC, it is critical to develop a dedicated approach for cyber resiliency that encompasses the direct and indirect cyber risks to a potential infrastructure as well as the relevant stakeholders. The members of the PLC understand first-hand the incredible amount of sophistication, investment, and expertise that goes into ensuring the defense and resiliency of payments networks and welcome the opportunity to continue this essential dialogue with the Federal Reserve on cyber resiliency.

*14. Should a CBDC be legal tender?*

Should the Fed move forward with the creation of a CBDC, the PLC believes that adoption of a digital dollar is more likely if the digital dollar has the status of legal tender.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

While the success of a CBDC in part relies on sufficient user adoption to justify the time and investment, it would presumably not be desirable if the CBDC were to replace commercial deposits as the primary store of value held by retail consumers, which would risk undermining the stability of the U.S. financial system and, during potential stress periods, risk reducing commercial bank deposits. Academic and central bank publications in recent years have detailed the implications of large-scale or volatile substitution between commercial and central bank money. In order to mitigate the often-unpredictable deposit substitution effect, many central banks across the globe have concluded that they will take a zero-yield, cash-like approach to the design and deployment of the CBDC. This often means providing a zero rate of return on CBDC holdings.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Limits on individual holdings of a CBDC may help to avoid destabilizing levels of deposit substitution, particularly during periods of a financial crisis and in scenarios where there could be heightened cybersecurity risk. In these instances, quantity limits could mitigate the impact of cyber theft. Other benefits include:● Limits can be easily understood by users;● Limits set at a reasonable level have minimal impact on consumer usability.Limits provide commercial banks with a strong understanding of their potential exposure to deposit outflows. However, the Fed should be aware of any potential implications of quantity limits. Research by the Swedish Riksbank suggests that the use of limits could have the unintended consequence of disrupting parity between the market valuation of retail CBDC deposits relative to commercial bank deposits, particularly during a stress period. In its 2018 "e-Krona Project Report 2" the Riksbank notes that:"It is the Project's assessment that limitations on access to e-krona may be associated with problems. For example, it may be difficult to maintain parity between Swedish krona in the form of cash, deposits in bank accounts and reserves. Assume, for example, that the e-krona becomes very popular but that there is a maximum limit imposed on each person's holdings. This could lead to the emergence of a market on which those who have not fulfilled their e-krona quota would be offering those who have the opportunity to buy e-krona in cash or by depositing money in a bank account at a higher than one-to-one price."Should the Fed develop a CBDC, PLC members encourage the Fed to work with the U.S. and international academics and consumer and industry stakeholders to understand and resolve technical issues preferably at the design stage, to set reasonable limits and explore how to handle inbound payments that would exceed a user's limit, as well as how limits might result in a loss of pricing parity between the central bank and commercial bank money.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Should the Fed develop a CBDC, PLC members strongly concur with the Fed's suggested "intermediated model" for the deployment of the CBDC and stated view that "potential intermediaries could include commercial banks and regulated nonbank financial service providers, and would operate in an open market for CBDC services." Open and competitive payment ecosystems are critical to enabling access, adoption, and use of payment options, which serve a wide range of user needs and preferences. Private-sector competition in the provision of payments stands to solidify and foster payments innovations, financial inclusion, and free flow of national and international payments. The PLC also concurs with the Fed's evaluation of the benefits of an intermediated model for CBDC in the discussion paper:● "An intermediated model would facilitate the use of the private

sector's existing privacy and identity-management frameworks; leverage the private sector's ability to innovate; and reduce the prospects for destabilizing disruptions to the well-functioning U.S. financial system." This model would ensure that the Fed retains institutional governance over core monetary infrastructure, while relying on private-sector competing networks to drive, including but not limited to, continued innovation, efficiency, identification, interoperability, and consumer protection.

Therefore, should the Fed continue to examine the deployment of a CBDC following a review of the submissions to the discussion paper, the PLC strongly encourages further engagement with the private sector to explore an intermediated model that works for the U.S. financial system.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

A CBDC without offline capability could limit the usability and usefulness of CBDC. The PLC concurs with the Fed's stated evaluation that the offline capabilities of a CBDC "could enhance the operational resilience of the payment system." From the diverse experiences of the PLC members, achieving offline capabilities would improve the overall CBDC system with greater resilience, reach, and financial inclusion. Delivery of offline payments could be structured as a value-added service, with risk underwritten by supervised private intermediaries, rather than as a feature of the core system. The handling of offline transactions by card-based ecosystems today provides an instructive model for how this could be accomplished by using a combination of technology and business roles to define liability and limit exposure. PLC members make use of counters on the payment card chip to manage the risks of offline payments. These counters can be set to allow offline transactions only when the number of offline transactions or cumulative amount of offline spend are below a certain threshold. These risk parameters may be set at a regulatory level or based on individual issuer risk tolerance. This allows the convenience of offline transactions for consumers and merchants at a manageable level of risk that is tolerable for all entities in the ecosystem. Even though these are innovative technologies that continue to evolve, there is likely no silver bullet to offline CBDC transactions, meaning that a stakeholder in the ecosystem will always be required to take on some level of risk. First, the challenge lies in finding a way to enable offline payments without exposing either the buyer, seller, or the Fed to the risk in case the payment might not ultimately be settled. Second, there is still a risk that criminals will try to exploit these new forms of money and platforms, as the Fed, governments, private-sector networks, and consumers continue to explore safeguards. As a first step, it's vitally important that the Fed collaborates with private-sector innovators to deploy tried-and-true security architectures into a CBDC's offline capabilities, including but not limited to public-key cryptography through strong user authentication measures and the use of offline limits on the payment card chip to only allow offline transactions below certain frequency or cumulative amount. The PLC believes in the paramount importance of rooting consumer trust in the commitment of the CBDC to strong security and privacy practices online and offline.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

A CBDC could provide consumers value as a payment mechanism if it can be used for a wide variety of in-person and digital transactions. However, enabling acceptance points is one of the greatest challenges to driving the mass adoption and usability of a new payment solution from day one. Therefore, should the Fed make the decision to deploy a CBDC, PLC members strongly recommend an open acceptance model. Linking the CBDC to existing payment networks with broad merchant acceptance could potentially make adoption and acceptance easier for merchants. Merchants are more likely to accept a CBDC payments option if this acceptance will not add unnecessary costs and complexities to their existing, proven transaction model. The Fed should continue to incentivize the private-sector networks to expand the reach of existing networks to a broad populace.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

PLC members concur with the Fed's stated evaluation that a CBDC could "creat[e] additional opportunities for cross-jurisdictional collaboration and interoperability" as cross-border payments and digital trade continue to grow in prevalence. As a first step, should the Fed continue a review of the applicability and need for a CBDC in the U.S., it would be beneficial to conduct further outreach and collaboration with the private sector on the potential establishment and interoperability across supervised intermediaries of a CBDC ecosystem. Protocols that facilitate interoperability require an exceptional amount of precision in their development, deployment, and ongoing execution. The establishment of such interoperability would help avoid closed loops that reduce the fungibility of money, fragment liquidity, and limit competition. The goal of interoperability is to strengthen the domestic payment ecosystem and reinforce the role of central bank money at its core, however international interoperability

will also be critical for facilitating cross-border payments.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

It is not possible to predict the entire scope of services enabled by a CBDC. Therefore, as future demands on payment systems continue to evolve in unpredictable ways, the PLC recommends that the Fed, should it make the decision to create a CBDC, embrace the necessary scalability, extensibility, and flexibility of the CBDC design to ensure the digital currency is future-proof for optimal value-added services.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

To make CBDCs successful, central banks need to establish the digital currency as a widespread means of payment while avoiding that they become a form of investment. As identified in the European Central Bank's December 2021 paper, "Central Bank Digital Currency: functional scope, pricing and controls," and discussed throughout the comment here, central banks need to consider three conditions for success in design and deployment of a CBDC, including:● Widespread merchant acceptance;● Efficient distribution of CBDC;● and, demand from consumers to pay with CBDC. Should the Fed move forward with a CBDC, the PLC strongly believes that private-sector leaders and innovators, particularly payments companies, can and should play a proactive role in helping guide and facilitate the birth and maturation of a CBDC in the U.S. PLC members have a breadth of expertise necessary to support every stage of a CBDC's evolution. In any case, the Fed should define a business model which preserves a competitive payments landscape, preserves sufficient and sustainable commercial incentives for participants, and allows seats for democratic governance with respect to the continued design and evolution of a CBDC in the U.S.

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*Name or Organization*

Pollee team organige by green tree

*Industry*

Individual

*Country*

Bangladesh

*State*

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

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*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*
14. *Should a CBDC be legal tender?*
15. *Should a CBDC pay interest? If so, why and how? If not, why not?*
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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

While the paper outlines a few potential, though unlikely, benefits of a CBDC, it doesn't address the primary question about what problem a CBDC solves and barely touches on the risks presented by such a digital cash product. First, let's address the economic risk which would be in the trillions and not just borne by the Federal Reserve. Developing the primary blockchain that would make the CBDC possible would be just the initial cost, and subsequently paid by taxpayers. The costs to adopt existing payment and bank systems capable of consuming CBDC would quickly mount into the trillions of dollars. This economic cost would be passed onto small businesses and community financial institutions, which would prevent many of them from being able to participate in a CBDC payment system.

Since the CBDC would be digital cash, criminals and hostile nation nation-states would highly target it. Billions are already lost each year due to fraud scams. Introduction of a CBDC would see such losses escalate quickly. If losses that result from individuals willingly sending money as a result of a scam are covered by the Federal Reserve then these costs could impact monetary policy and the overall financial system. Currently, if a financial institution follows the law and does not cover fraud losses from consumers who authorize the transfer of funds, the financial institution bears the reputation risk from negative publicity. If the Federal Reserve operated this way, the very value of the dollar would suffer from a reputation of losses, and many would exit the CBDC. Lastly, the paper doesn't touch on known blockchain technology risks such as high-power consumption and the resulting environmental damage. It doesn't address quantum risk related to the encryption algorithms used by current blockchain technologies. A much more thorough review of risks should be performed and published before any steps are taken to develop a CBDC.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes. The proposed benefits could be better achieved by updating existing technology, expanding central bank exchange agreements, and reducing regulations. The majority of US dollars in circulation now are digital, and most transactions are digital. New technologies are already in development that will enhance digital transactions without having to create an entire new infrastructure for a CBDC. FedNOW will provide a greatly improved payment system that will spur and drive innovation that exceeds what might result from a CBDC and will fit into the existing payment infrastructure. If the goal is increasing financial inclusion, a review of laws, regulations and guidance that currently incents financial institutions to de-bank riskier customer behaviors should be reviewed and updated to encourage products and services for the unbanked.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

It is highly unlikely that a CBDC, combined with a consumer account held by the Federal Reserve, would impact financial inclusion. For many consumers who do not have a bank account currently, it is unlikely that an account at the Federal Reserve would be viewed positively or desired. Additionally, digital currencies are not well understood or accepted by the majority of the population. Recent, wild swings in the value of digital currencies have led many to exit the market and tainted the perception of digital currencies in general. Blockchains' open and distributed nature is one of the key mechanisms that establishes trust

in the technology and makes it work. Any central bank-controlled blockchain will, by necessity, not be open or distributed but tightly controlled, reducing trust in the technology and offsetting possible increases in trust due to the government backing. A CBDC on its own would have no impact on financial inclusion. Finally, the staggering upfront costs to update payment systems, bank core systems, accounting systems, point of sale systems, and other technology that forms the infrastructure of the modern payment system would prevent many small businesses and community financial institutions from being able to participate, which would have a large negative impact on financial inclusion.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

A US CBDC offered through consumer accounts at the Federal Reserve would have a significant negative impact on the Federal Reserve's ability to implement monetary policy. Removing funds from the existing financial system would reduce the ability to lend, limiting the ability to implement monetary policy effectively. Additionally, the negative impact on community financial institutions would be significant.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

The paper doesn't address a number of known risks, such as fraud risk, risk of the system being non-functional, risk of a centralized financial system, disintermediation of financial institutions, and doesn't account at all for unknown unknown risks from blockchain technology. These, and other, risks present a significant potential to seriously undermine financial stability.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

A CBDC will have adverse impacts on the financial sector no matter how it is developed. If used strictly by financial institutions, the costs to incorporate a CBDC into existing bank and payment systems would greatly outweigh any benefit a CBDC would bring. If the Federal Reserve offered consumer accounts holding the CBDC, the entire financial sector would be disintermediated from the financial system. This would negatively impact millions of consumers as access to services offered by financial institutions would no longer exist.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

There are no tools that could mitigate the adverse impact on the financial sector of a CBDC offered to consumers through a Federal Reserve account. There are also no tools that will mitigate previous discussed risks to a level that would provide comfort to the millions of consumers who would lose access to their community financial institution.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Cash usage would increase, along with the risks associated with cash usage, if a CBDC is offered to consumers through a Federal Reserve account. A large number of consumers would consider this an encroachment on their privacy and would move to using more cash. The combined negative impact of a CBDC on community financial institutions would leave many consumers with fewer banking options and further exacerbate the increase in cash use.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

International standards for financial transactions have already been developed that carry a great deal more information regarding the transaction than a blockchain based CBDC could. Expanding existing payment systems to use these standards and implementing central bank settlement agreements would be the preferred method to evolve cross-border payments.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The US dollar is the world's currency due to the faith and trust in the US. Decisions by other nations to issue a CBDC should not influence a US decision to do so. A CBDC must, first and foremost, solve a problem. And it must solve that problem in a way that existing payment systems can't and that those systems are not able to be updated to solve. It must also

strengthen the U.S. financial system and not lead to the disintermediation of community financial institutions. The risks of a CBDC greatly outweigh any benefit of offering one.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

This paper doesn't even scratch the surface in discussing risks to the U.S. financial system associated with a CBDC. Mitigating potential risks from a CBDC is not possible with a CBDC accessed through consumer accounts held at the Federal Reserve. Adding such an unregulated and technologically risky mechanism into the payment system exponentially adds to the risks a CBDC will bring. The unlikely potential benefits from a CBDC do not outweigh the risks it presents to a safe, robust, effective and secure U.S. financial system.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

The only way a CBDC could provide privacy to consumers without providing complete anonymity is if the CBDC is facilitated through existing financial institutions and their existing regulatory system. Financial institutions are well equipped to manage the risks of illicit financial activity while protecting consumer privacy.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

No. Using the Merriam-Webster definition of legal tender – money that is legally valid for the payment of debts and that must be accepted for that purpose when offered” – would place an incredible burden on every business and individual in the US to be able to accept this form of payment immediately upon the release of a CBDC. This would not be technically feasible or practical.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

If financial institutions strictly hold the CBDC as a reserve, similar to reserves currently held in the Federal Reserve, it should function the same as current reserves. If the CBDC is held in private consumer accounts, the CBDC should not pay interest as it is not inherently being used to generate new money through the lending function. Businesses or others holding a CBDC on behalf of a consumer may be free to pay interest at their discretion.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

If held in individual consumer accounts, yes. A CBDC would essentially be digital cash. We already see scams and fraud accounting for billions in losses to consumers and small businesses each year. A digital cash product, such as a CBDC would be heavily targeted by criminals and hostile nation states. Without quantity limits, the amount of losses would quickly escalate into the trillions, whether those losses are borne by the individual consumer account holder or the Federal Government. The resulting losses will result in reputation harm to the entire US financial system and the value of the dollar. Setting limits that would effectively mitigate this risk would severely limit the value of a CBDC payment mechanism.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

While there is no real problem that a CBDC solves and no need for one, if one is developed, access to the CBDC should be intermediated through financial institutions as access to primary US payment systems is now. The regulatory structure already exists and financial institutions are already well established to facilitate secure accounts and transactions. Using the existing financial system would help limit the costs a CBDC would create. Bringing a CBDC as a non-regulated payment system to the effective, safe and trusted U.S. financial system creates great risk.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Offline capabilities would greatly increase a product that already carries great risks, with no ability to mitigate those risks. That an offline block could be manipulated by one party to the transaction prior to it being merged into the central blockchain when it comes back online presents great risks. The resulting harm to the U.S. financial system could be catastrophic.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

It isn't that a CBDC should be designed for the point of sale. It's that there are thousands of existing point of sale systems, banking systems, and other payment systems that would need to be updated to use the underlying CBDC. This would represent trillions of dollars of expense, much of which would be passed down to small business and community banks, disenfranchising them from this payment mechanism.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

As with question 19, it is the updates and modifications to existing payment platforms to interact with the CBDC that would end up costing trillions of dollars and present great economic risks to the financial system.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Any blockchain-based product developed with current technology would quickly need significant updates as quantum technology becomes more and more mainstream. While existing systems can be adapted over time as quantum technology advances, at some point the entire basis of a blockchain system will need to be redeveloped to quantum standards due to the mathematical nature of how the blockchain operates.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

In terms of additional potential benefits, payment efficiency will likely be enhanced. If designed and configured correctly, CBDC technology would offer a platform that allows competing and innovative payment services to thrive, which would lower costs significantly.

A CBDC payment system would provide a new way to make payments, serving as a new backup to the electronic payment system in place. This is convenient since the current backup system, physical cash, is showing a downward trend in usage. The development of CBDC could generate efficiency improvements in the financial system. Common knowledge of an inevitable faster and cheaper payment system could serve as an incentive for banks to carry out substantial improvements in their own payment rails. Additionally, there is an important antitrust potential benefit. A CBDC would allow consumers the option to keep personal information private when interacting with online payment platforms. This will remove important market failures such as the potential digital data monopolies (since private information about individuals could allow firms to implement price discrimination), or externalities that lead to underinvestment in privacy by consumers (which allow private firms to make inferences about other people for free). The implementation of monetary policy will benefit from real-time information gathered from CBDC collective usage. Although the net impact on monetary policy will depend on its final design (as explored in subsequent questions), a CBDC will allow the Federal Reserve to have access to massive amounts of data and be able to follow the path of the CBDC in the economy, in real-time, and without a breach of privacy. With this information, the Federal Reserve could improve the efficacy of its monetary policy. A CBDC might facilitate certain government payments and transfers. For example, transferring benefits to households to deal with a particular negative event (e.g., natural disasters) or means-tested payments could be done efficiently with CBDC. Finally, digital currency has the potential to reduce the high costs associated with the management of bills and coins. Businesses collectively spend hundreds of millions of dollars each year on cash management services to protect them from the risks associated with holding, transporting, and handling cash. Similarly, the Federal Reserve could save an estimated 90% on the costs associated with issuing, managing and replacing notes and coins. In terms of risks not mentioned in the paper, there could be a lower-than-expected level of adoption. This could affect the Federal Reserve's reputation, which is crucial for managing expectations of the public for better implementation of monetary policy. If the CBDC does not have offline capabilities it would be prone to potential failures. A CBDC that works using power sources or telecommunication networks may not work in the case of a network disruption or power outage. Bitt's offline CBDC solution (in patent filing stage) has offline transaction capabilities, with a reconciliation mechanism to the online network. On policy considerations, it is necessary to frame the development and implementation of a CBDC within a strategic plan for the payment system. The CBDC should only be a piece of this plan, which should also include incentives to innovation and the role of government, private sector and academia, regulatory changes aiming to increase innovation, and a plan to work with international partners for setting global standards.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Summarizing the paper, the benefits mentioned include safely meeting future needs and demands for payment services, improvements to cross-border payments, supporting the dollar's international role, promoting financial inclusion, and extending public access to safe

central bank money. It is recommended to not approach the CBDC plan as a dichotomous on-off decision. Instead, it should be framed within a strategic and comprehensive plan for the payment system, especially in the context of web3 and decentralized financial ecosystems. The CBDC should only be a piece of this plan, which should also include incentives to innovation and the role of government, private sector and academia, regulatory changes aiming to increase innovation, and a plan to work with international partners for setting global standards. With respect to meeting future needs and demands for payment services, a first option is to correct inefficiencies in the current payment system. There are substantial frictions in payments in the US, as MIT professor Christian Catalini mentions in recent research, due to legacy infrastructure, market fragmentation and lack of competition. Potential solutions are the introduction of a fast payment system such as FedNow, estimated for 2023, a Real-Time Gross Settlement (RTGS) system, which, notwithstanding, would have a cap of USD25,000 per transaction. Besides, this option does not address key requirements of the digital economy (e.g., configurable programmability, among others). A second, more comprehensive option is to foster digital currency competition and innovation. This would entail the Federal Reserve allowing access to Fed master accounts to an ample set of retail digital currency and stablecoin providers, such as noninsured banks, fintech payment firms, and even nonbank fintechs. However, private digital currencies and stablecoins are subject to platform and operator risks and may require clear cut standards and regulations that have yet to be defined. As for the dollar's international role, and improvements to cross-border payments, these benefits do not strictly necessitate a CBDC. The international dominance of the US dollar rests on factors that are difficult to replicate in the short-term, and are not necessarily related to having a CBDC. The depth and liquidity of a global, and accessible US financial market, the fairness and stability of the US legal system, the reliability of US monetary and financial policy, lack of barriers to international capital flows, among other strengths, are the pillars of such dominance. Nevertheless, there is an outstanding opportunity for the country to gain global influence through the development of standards for CBDC, especially for cross-border transactions. This leadership cannot be obtained without the US developing and testing CBDC technology. Regarding financial inclusion, an ongoing alternative is the Bank On initiative, which promotes nationwide low-cost bank accounts. Data from 2020 indicates that there is rapid scaling of the program, with 82% of new accounts also new to the financial institutions (which includes youth participation). Although more analysis is needed, it seems encouraging so far. However, a CBDC with design characteristics that appeal to the unbanked and underbanked could have the potential to target that segment of population, as it is explained in the following question. Therefore, a well-designed CBDC is more of a complement than a substitute to the Bank On initiative. Finally, in terms of extending public access to safe central bank money, this is important to the extent that physical cash usage and acceptance decreases dramatically. Although the US is not there yet, the downward trend in usage is undisputable (cash share of payments in 2012 was 40%, whereas in 2020 it reached 19%). The observed shift is towards private money, which is not riskless. Instead, it depends on the solvency of the financial institution issuing it. Same applies in a near future in which private stablecoins and cryptocurrencies take a more prominent role in terms of means of payment. Providing risk-free money to the public in the form of CBDC could enable a safer alternative store of value in times of economic uncertainty.

### *3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Financial exclusion is a significant problem in the US. It is estimated that around 7.1 million households are considered unbanked (2019 FDIC Survey of Household Use of Banking and Financial Services), and about three times more are underbanked. Besides, with 5.4% of total population as unbanked, the US is at the bottom compared to other G7 countries. Financial inclusion is important since, according to the World Bank, it has the potential to help the achievement of ending extreme poverty and promoting shared prosperity. This is accomplished by facilitating the use of financial services, that may result in investment in health, education, insurance, and new businesses. Moreover, they can help the poor to smooth volatile incomes and expenses when the household breadwinner falls ill or loses his/her job, or when major expenses arise. In addressing financial exclusion, it is important consider the root problems. Unbanked households have consistently cited a set of main reasons for their financial state in the FDIC surveys of 2013, 2015 and 2019. These reasons are mostly related to costs ("don't have enough money to meet minimum balance requirements", or "bank fees are too high") or trust/privacy ("do not trust banks", "avoiding a bank gives more privacy" and "ID, credit, or former bank account problems"). Cost is also a crucial determinant of financial exclusion, specifically for digital payments. For example, unbanked households are more likely to be excluded from digital payments than banked households, which could be due to not having home internet access, a smartphone, or cell phone service. In other words, using digital payments is expensive and costs matter for unbanked households. A CBDC could substantially improve the financial inclusion issue.

First, a CBDC would lower financial transaction costs by enabling multiple intermediaries to enter and compete amongst themselves. Also, an increased number of licensed payment service providers, especially those that are not regular financial institutions, would elevate the trust of financially excluded households in using CBDC. Additionally, it facilitates the reception of cash transfers from government, which is especially relevant for low-income families that are often financially excluded. More importantly, a CBDC can be designed and configured to foster financial inclusion. This design configuration should require no minimum balance, provide low-cost or free access, and work under any circumstances (e.g. offline capabilities), assure privacy for user, provide multiple endpoint access (not only e-wallet, app, or website), and allow for low-cost conversion to physical cash. If a CBDC is designed considering financial inclusion, it could serve as a mechanism to begin addressing the problem. The right design of the CBDC would substantially increase its adoption by the unbanked and underbanked, and progressively see these households start using a broad gamut of financial services. For that purpose, and referring to the list of barriers explained above, as explained by Jesse Leigh Maniff of the Federal Reserve Bank of Kansas City in a 2020 paper, a financially inclusive CBDC design should require no minimum balance, provide low-cost or free access under any circumstances (e.g. offline capabilities), be able to assure privacy for user (and at the same time comply with anti-money laundering regulation), provide multiple endpoint access (not only e-wallet, app, or website, but also cards and other payment instruments), allow for low-cost conversion to physical cash, and require that CBDC service providers go beyond regular financial institutions (which the unbanked do not trust) to include payment service providers, social platforms, and other intermediaries who qualify for a CBDC integration or requisite payments services license.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

In terms of monetary policy implementation, initially, with the deployment of the CBDC, there may be a partial shift from bank deposits (disintermediation) and physical cash into CBDC. It is hard to estimate the amplitude of the shift, but, whatever it is, the shift from physical cash into CBDC is an exchange of cash for cash, so the balance sheet of both the Federal Reserve and of households is going to remain the same. However, there might be differences in volatility. To the extent that the demand for CBDC is more volatile, it could affect the overall volatility of the autonomous elements in the Federal Reserve Balance Sheet. Under a floor system, this is not a problem, but if the Federal Reserve at some point abandons the ample reserve approach, then an additional layer of liquidity intervention would be necessary. Regarding the shift from deposits into CBDC, this will decrease the commercial banks' reserves at the Fed, which, in principle, is what happens regularly when the public shifts from deposits into physical cash. This is not a problem as long as the reserves stay above the threshold for the ample reserve approach to function properly. However, if the shift is large enough, the ample reserve approach would be compromised. If that were the case, the Federal Reserve would need to compensate for the reduction in reserves so that its level is at least above the floor. They might also need to revise their current floor upwards, if volatility increases significantly due to the high speed at which CBDC is transacted. Increasing commercial banks' reserves is standard implementation of monetary policy, and the Fed has multiple tools to accomplish that. However, there are two subtle issues here: banks need the right collateral to increase their reserves, which, for a sizable increase, they might not have enough. For that, the Federal Reserve might need to consider supplying reserves against a wider range of collateral. Secondly, the balance sheet of the Federal Reserve is going to increase to accommodate the issued CBDC. This in turn might need a fine-tuning in terms of risk management on the Federal Reserve side, depending on the specific assets held. The effects of monetary policy transmission mechanisms are probably going to be faster (due to the digital nature of the CBDC, depositors can more easily and costlessly move between deposits and CBDC), stronger, and implemented more efficiently. This effect is going to increase in proportion to the scale of adoption of the CBDC. For example, to the extent that financial inclusion is improved, then the interest rate channel will be reinforced, because more households would have access to interest-sensitive borrowing and saving instruments. Additionally, the pass-through of policy rates to lending rates is likely to increase, since competition in the provision of credit between banks and nonbanks would be greater. Monetary and fiscal policy could also be implemented more efficiently. The Federal Reserve would have the opportunity to study and analyze the dynamic of the CBDC in the economy, in real-time. Anonymized, aggregated data should be captured to ensure data is not used for nefarious purposes, and users' privacy is respected. With this information, the Federal Reserve could assess in real-time which specific monetary or fiscal measures are more effective, which would significantly increase the efficiency and effectiveness of both types of policies. Finally, a CBDC could be designed to pay interest rates. The options are ample: pay interest rates that are positive, negative, variable, temporary, non-linear, or, more controversially, fees applied to CBDC not used in specific time frames or for a particular purpose, among others. This would definitively add

tools for the Federal Reserve to implement more effective monetary policy. This comes with secondary effects and therefore should be assessed further. More information on this topic can be found in subsequent sections. In summary, the Federal Reserve will have to manage some issues in terms of the mechanics of its monetary policy, but the transmission channels are probably going to work faster and become more sensitive to changes in the policy rates. On top of that, the Federal Reserve will substantially improve its knowledge of the transmission of monetary and fiscal policy, so an optimization of these policies is reachable. This is definitively a gain for the operations of the Federal Reserve towards accomplishing its dual goals, and these results are obtained with a non-remunerated CBDC.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

The implementation of a CBDC could introduce outcomes that affect financial stability, the net effect of which should be assessed. In a crisis, a CBDC could be perceived as a safer asset with respect to bank deposits, generating a move from the latter to the former, increasing the probability of bank runs. This disintermediation (which comes with a potential reduction in credit, and increase in banking cost, both for credit and deposits) is not confined to a period of stress. An event of rapid and profound substitution from deposits into CBDC (e.g., at the start of CBDC deployment) would be equivalent to a bank run too. This could happen more easily with a CBDC (depending on its design, as discussed in the final part of the answer) because of the elimination of frictions and costs to move bank deposits to the digital currency holding account. Notwithstanding, the existence of other liquid and safe alternatives could mute the systemic risk from CBDC. In effect, if the public can move their deposits to such alternatives as narrow banks or Treasury-only mutual funds (these types of mutual funds registered significant inflow after the collapse of Lehman Brothers in 2008, as opposed to observed strong outflow in most prime money market mutual funds), then CBDC remains one option among many. On the other hand, the implementation of a CBDC has important positive effects on financial stability. To begin with, a CBDC would provide a backup payment system outside of the banking system, which would reduce systemic risk. This may grow in importance if payment infrastructure becomes increasingly internationalized. Furthermore, CBDC that could restrain the demand for private digital currencies, especially in the absence of adequate regulation, could strengthen financial stability. To the extent that a private digital currency becomes systemically important, the risks associated with its financial failure would be systemic too. A CBDC, by being a digital instrument, would generate real-time information to alert the Federal Reserve that a bank run is taking place. Thus, the Federal Reserve can react quickly, in real time, by using its lending facilities, activating elements in the design of the CBDC for such events (e.g. limit caps for daily transactions, or negative interest rates) or if necessary, imposing a bank holiday. An evolved CBDC solution could provide dynamically implemented functions such as circuit breakers, interest rates, and transaction and holding limits to discourage bank runs should they be detected in real time.

In conclusion, it is unlikely that the net effect on the probability of a run is positive. This statement is based on current research and modelling which clearly is not based on observed information, and therefore is subject to interpretation. However, even if the statement happens to be incorrect and the probability of bank runs increases, there is a set of central bank policies, behaviors from commercial banks and design elements that could be embedded into the implemented CBDC that could act as a buffer. These important considerations are examined in detail in the following questions.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

For households to hold and use CBDC they would need to shift from their physical cash and commercial bank deposits and into the central bank digital currency. Commercial banks would witness a reduction in their liabilities (lower deposits), along with a reduction in assets (banks' reserves at the central bank, which are used to transfer to the household's CBDC account). Commercial banks could end up with a contraction in their balance sheets. These effects would be more pronounced as commercial bank liabilities are in direct competition with a CBDC (i.e., retail deposits). Banks might try to compensate for the reduction in public deposits by switching to other forms of funding, such as wholesale deposits, which are more expensive and volatile. Additionally, they could vie with each other for retail deposits remaining in the system through an increase in deposit interest rates, which would result in decreasing profits. This decrease could induce an increase in risk-taking lending practices, accompanied by a rise in lending rates. In order to mitigate such risks in the short term, the central bank could resort to its lender of last resort function and compensate for the loss in deposits with an injection of liquidity or an adjustment of reserve requirements. Also, lower physical cash usage would translate into savings from cash handling by the banks. More importantly, a CBDC would bring new opportunities for innovation that could benefit participants (including expected newcomers) of the financial system across the board. They

could offer more diverse payment services, such as programmable payments, or more affordable ones, with less intermediation services, including cross-border payments. Also, this more competitive landscape could bring in innovative lending services by non-banking institutions, offsetting (although unknown to what degree) the initial partial-equilibrium reduction effect. Regarding stablecoins and other nonbank money, the disintermediation a compensatory effect would be similar. However, there is an important difference that must be considered, especially to the extent that some of these nonbank money providers scale up. Stablecoins are generally fully collateralized by safe assets such as fiat currency deposits at banks, and high-quality liquid assets (HQLA) such as government bonds. There is evidence though that for some issuers the assets backing stablecoins are not completely safe as claimed (e.g., Tether, who was fined by the New York Attorney in 2021), which brings the issue of financial stability to the table, especially if the stablecoin issuer has reached a global scale. Some algorithmic stablecoins pose even larger risk, which is evidenced by the recent collapse of Luna and the UST stablecoin. More significantly, stablecoins usage is growing rapidly. The trading volume for example is already at the level of US B2B volume, which despite a comparatively small base, is possible due to the velocity to settle transactions. Although most of that volume is associated with transactions of cryptocurrencies, it is forecasted that their uses will expand, along with its demand. The issue is that a scenario of growing demand for stablecoins also means a high demand for HQLA. This situation has consequences, since commercial banks utilize HQLA to fulfil their regulatory liquidity and capital requirements. Since HQLAs are scarce, banks might not be able to increase their reserves at the central banks. If the government issues more instruments to keep up with the demand, it would be crowding out funding for credit. Furthermore, the cash collateral for stablecoins carries significant liquidity risk. Stablecoin deposits are very volatile due to the high velocity of their transactions. If the cash collateral is not managed adequately, accounting for sudden withdrawals (e.g., by investing cash collateral in long-term Treasury bonds) there could be a risk to financial stability. Notwithstanding, within a general equilibrium point of view, nonbank money will also come with the compensatory arguments put forward for the CBDC. These benefits could in the end offset some or all the negative effects discussed in the case of stablecoins.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

The Federal Reserve already has a solid line of defense in place to reduce the probability of disintermediation or bank runs after implementing a CBDC. High-quality supervision and regulation, and deposit insurance, strengthen public trust in banks. The Federal Reserve has multiple ways to provide liquidity into commercial banks (and into nonbanking institutions), including its role as a lender of last resort. One additional mechanism available to the central bank is to resort to its policy rate (and additional monetary policy tools) to counter tighter financial conditions from disintermediation. Neither of these instruments would affect the benefits of a CBDC. Furthermore, the commercial banks themselves have two important mechanisms to react to potential disintermediation. First, they can look for alternative sources of funds, such as wholesale deposits. By doing that, banks can offset the reduction in deposit, at the expense of lower profits, but the offset could be substantial, since banks would react. This line of reasoning itself could motivate banks to embark on serious improvement of their payment systems even before the CBDC is implemented. Finally, the CBDC itself could contain design elements to counter disintermediation and potential runs, the two more important being a tiering remuneration system for the CBDC and a limit on the quantity of CBDC a user can hold. Regarding the former, the remuneration applied to the CBDC depends on the amount held; above a certain level the CBDC pays a lower interest rate or not at all. In this way the degree of disintermediation (shift of deposits into CBDC), is effectively limited. It is even an option to apply a negative interest rate on tier 2 in crisis time or starting the implementation of the CBDC, sparing tier 1. The second element of design is capping the amount of CBDC held by a single user. It is straightforward to see that with this design a CBDC becomes innocuous for financial stability. This would be especially true if the CBDC pays positive interest rates. However, a cap on CBDC amount per individual introduces frictions in its role as part of the payment system. For example, there is a risk that a payment is rejected due to the receiver having reached the CBDC limit, unknown to the payer in advance. There are ways to deal with such situations and this is explored more in depth in following questions.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

According to the Diary of Consumer Payment Choice, conducted by the Federal Reserve, cash share of payments in 2012 was 40%, compared to 19% in 2020. While this is not as dramatic a decline as with the case of Sweden, where cash is used in less than 10% of all transactions, it presents a clear view that cash is leaving the payment scenario and a

cashless society is not a utopic future scenario anymore. The shift in cash usage is toward private money. It is therefore important to note the crucial differences between public (central bank) and private money to determine the best solution to public access in the digital era. Central bank money is safe, riskless, and adequately performs its three public roles: medium of exchange, store of value and unit of account. Private money has been made safe through regulation and support. For example, deposit insurance, the financing and lender of last resort functions of the central bank, and banking regulation, make sure that banks are solvent all the time. Despite these measures, private money is not risk-free. The perceived value of private money depends on the perceived solvency of the financial institution issuing it, and those financial institutions could fail. Therefore, allowing the current trend in cash usage to go to the limit is dangerous. Without public money, a bank run is more likely (the lender of last resort would not be available), and other episodes of instability could undermine confidence in the financial system.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Digital payments are expected to grow substantially in the coming years, with or without a US CBDC. For instance, according to market and consumer data firm Statista, "Total transaction value [in digital payments] is expected to show an annual growth rate (CAGR 2022-2026) of 15.45% resulting in a projected total amount of US\$3,200.00bn by 2026." One more concrete example is the expected growth in use of stablecoins. According to a 2021 paper on Cato Journal, authored by Caitin Long, the annualized trading volume of stablecoins is in the order of US\$16 trillion, which is comparable to the level of US B2B payment volume of US\$25 trillion, despite a comparatively small base, and possible due to the internet native user experience, and the velocity and ease with which transactions are settled. Although most of that volume is associated with facilitating trading of cryptocurrencies, it is forecasted that use cases will expand, along with demand. Market players in the digital payments space will seek to capitalize on this growth trajectory, both in the domestic and cross-border market, by catering to consumers with newer products and services. Digital wallets and account-to-account transfers are examples of winners in the short-term future. This trend has been accelerated by the COVID-19 pandemic. Further into the future, consumers' internet-connected devices (including wearable technology), and the IoT will increase contactless digital payments. Greater fragmentation in the digital payment space is likely to occur as firms seek to corner a piece of the market and engage in offering proprietary digital payment systems. This can have the effect of locking-in customers, leading to higher consumer costs, both in terms of individual services and in the cost of switching providers. There may even be greater competition among firms as they align themselves to support particular digital platforms facilitating a much larger digital payment space and providing consumers greater payment flexibility. With the proliferation of differing digital payment options, there is an increased potential for volatility in the financial markets. The Federal Reserve and other regulatory agencies will need to keep abreast of the digital payments and their potential impact on the entire financial system. Enhanced and greater regulation in the digital payments' arena can be expected. There will also likely be increased integration of card payment networks with cryptocurrencies, and other digital payments, as they seek to maintain relevance in a rapidly shifting payments environment. Card networks will endeavor to mitigate the competitive pressures resulting from increased cryptocurrency use while profiting from the enthusiasm for these types of digital payments. On the cross-border side lack of a US CBDC could see the continued and even enhanced role for US dollar stablecoins which are already heavily transacted outside the US. Unless a regulatory framework is enacted for stablecoins, the Federal Reserve must be prepared to evolve its monetary policy transmission techniques. Furthermore, on cross-border payment evolution, innovation and competition would be prominent key drivers of growth, endogenously interacting with an upward and evolving demand from established and new actors. For example, in addition to the continuation of increase in B2B international trade payments, retail remittances and cross-border e-commerce are poised to exhibit substantial growth. The emergence of new payment technologies and widespread adoption of digital payment tools, plus the comfort with small-item purchases and increased security with this type of transaction, are all contributing factors for increased remittances and e-commerce transactions. Globalization trends, both the large corporation and SME level, will also significantly contribute to cross-border payment growth. In particular, the global expansion of SME would be associated to innovation in payment solutions catering to this segment. Recent examples of the former are payment solutions such as Mastercard's B2B Hub, or SWIFT's GPI. Additionally, and reinforcing these trends, it is foreseeable that FinTech companies will continue their expansion of services for cross-border payments, with more investment flowing into these types of firms. For example, in 2021 Remitly and Wise went public, and Neobanks (e.g., Chime, Revolut), according to a report by Grand View Research, will grow close to 50 % from 2021 to 2028.

*10. How should decisions by other large economy nations to issue CBDCs influence the*

*decision whether the United States should do so?*

The international dominance of the US dollar rests on factors that are difficult to replicate in the short-term, unrelated to having a digital currency. Among other strengths, the depth and liquidity of a global and accessible US financial market; the fairness and stability of the US legal system; the reliability of US monetary and financial policy; and lack of barriers to international capital flows are the pillars of such dominance and no country or region is close to replicating them in the short-term. However, successfully developing and implementing a digital currency has its advantages. China, one important global competitor, seems to be ahead with its digital yuan (DCEP), currently in a pilot program. Once fully deployed, the digital yuan could expand rapidly through its usage by foreign companies operating in China, or the internationalization of Chinese payment companies. Moreover, according to a report from the Hoover Institution (Digital Currencies: The US, China, and the World at a Crossroads) China is even testing its e-CNY at a wholesale, cross-border level with the central banks of Thailand, United Arab Emirates and Hong Kong. This will probably expand business opportunities and increase China's global influence. There are important barriers 'yuanization', due to factors such as capital controls, distrust in its rule of law, lack of deepness of the yuan bond market, and the quality of Chinese financial institutions, among others. These factors are precisely the reason for the US dollar dominance, as previously mentioned. Nevertheless, as Professor Darrell Duffie and Elizabeth Economy state, there is an important opportunity for the US to gain global influence by ensuring the USD continues to play a key role in internet native payments. If the US develops its own CBDC technology and standards, it could lead in the development of global standards for cross-border payments using CBDC. Multiple countries would probably subscribe to such standards, especially to avoid a digital dollarization of their economies, which would interfere with the normal operative of their monetary policy. This leadership cannot be obtained without the US developing and testing CBDC technology. Developing such technology and standards does not imply that the Federal Reserve must deploy its CBDC. However, by not pushing ahead with a fully developed and ready-to-deploy CBDC, the US could forfeit its opportunity to lead the world in this matter, and such a void will be filled by another nation. Therefore, aside from the economic gains, the US should study closely what other countries are doing, related to the issuance of CBDC, especially in terms of cross-border standards.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

The potential risks the Federal Reserve is most concerned about, presented in its report, include changes to financial sector market structure, safety and stability of the financial system, efficacy of monetary policy implementation, privacy and data protection and the prevention of financial crimes, and operational resilience and cybersecurity. For the first two risks, the document suggests a design choice for the CBDC: non-interest bearing and limited amount of CBDC to hold or to accumulate over short periods. However, there are more design options that could be assessed. For example, a multi-tiering remuneration scheme, in which the remuneration applied to the CBDC depends on the amount held; above a certain level the CBDC pays a lower interest rate (which could be negative in times of stress). Furthermore, this multi-tiering design could include limits on daily transfers. Additionally, differences in frameworks (e.g., limits on CBDC holdings, applied interest rates, or combinations) could be imposed depending on which entity holds it: businesses categorized by industry, and households. Framework disparities could be based, for example, on exhibited excessive take-up or variability in holdings of CBDC. Importantly, some of these measures could be temporary, which could be deemed necessary during the implementation phase of the CBDC, or in a crisis. It is necessary to emphasize that there are offsetting effects to the aforementioned financial system risks; so risk management measures, although available, could not be necessarily implemented. For example, implementing a CBDC would bring new opportunities for innovation that could benefit incumbent and forthcoming participants of the financial system. They could offer more diverse payment services, such as programmable payments, or more affordable ones, with less intermediation services, including micro payments capabilities that could enable new and innovative business models currently unachievable due to cost and functionality related restrictions inherent in the traditional financial system. This more competitive landscape could bring in innovative lending services by non-banking institutions. It is impossible to say how significant the counter-risk effect would be, but this might be discovered or clarified as more data and research are presented. In that sense, it is fundamental to study the most advanced CBDC projects around the world in detail, and to structure CBDC pilot projects with operating experience and lessons learned in mind. On privacy data protection, the intermediated CBDC model, where personally identifiable information (PII) is segregated from the CBDC transaction network, offers the best balance of customer privacy and regulatory oversight for illicit financial activity, as explained in the following question. This is a multi-pronged solution consisting of plenty of control points, abiding by the corresponding regulatory norms. Accountability tools such as

auditable user logs, tamper detection, role-based access permissions, and other governance tools will play a key role in preserving privacy and arriving at an optimal design for a US CBDC. Finally, regarding security, the multiplicity of hardware and software risk management solutions should be comprehensive and based upon extensive risk assessment.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

More than one approach to consumer privacy can be incorporated into a CBDC design. For instance, it can be mandated that low-level CBDC transactions of a certain amount do not require the same KYC requirements and, as such, can be completely anonymous. Similarly, these low-level payments can have additional restrictions e.g., a limit on the number of these transactions that can be initiated by any one CBDC wallet holder. This would restrict the ability to use multiple low-level CBDC wallets for illegal activity. For more general usage however, an intermediated CBDC model where personally identifiable information (PII) is segregated from the CBDC transaction network offers the best balance of customer privacy and regulatory oversight for illicit financial activity. Under an intermediated model, the CBDC is distributed to the public via intermediaries approved by the Federal Reserve. These intermediaries are responsible for KYC, KYB and other compliance related information gathering necessary for the onboarding of CBDC users. In conjunction with this, PII is divorced from the transaction network so that anyone monitoring the network cannot identify the specific user behind a transaction. Customer data never enters the core CBDC transaction network, but, instead, resides with the approved intermediary that onboarded a customer. Regulatory agencies will be able to query the transaction network for suspicious activity, where they can obtain wallet addresses and associated CBDC balances, but not the PII of the user who initiated the transaction. It should be noted for clarity that the Fed will have operational oversight of the network and responsibility for network monitoring, regardless of if this is outsourced to a third party or not. Regulatory agencies can make valid legal requests to the intermediary, based on the suspicious activity identified, to obtain the associated customer behind a wallet address. In this way, the Federal Reserve, or other regulatory agencies, cannot see what individual customers are transacting on a daily basis. They will only see transaction activity attached to wallet addresses. Thus, customer privacy is maintained, but there is a verifiable process for obtaining customer identity if illicit activity has been found. Furthermore, accountability of CBDC system administrators is of the utmost importance to ensure transaction data is not accessed for nefarious or unjustifiable purposes. The unwarranted access of individuals' or businesses' transaction information could be significantly harmful, which is why any individual with access to the CBDC transaction network should be held accountable for all instances in which they query the network for transaction data. Auditable user-logs, tamper detection systems, and other organizational procedures should be implemented in order to mitigate this risk and provide the requisite assurances to all who transact on the CBDC network. Such design options will require the support of a robust legal and policy framework that spells out the requirements and responsibilities of each of the stakeholders in the CBDC network to ensure the protection of user rights and the safeguarding of customer privacy. For instance, the technical approach to the separation of customer PII from the transaction network, the legal and regulatory obligations of intermediaries in their KYC capture, as well as the legal process for requesting customer information from an intermediary, where evidence of suspicious activity has been identified by the Federal Reserve or other regulatory agency, should be clearly identified.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

To foster operational and cyber resiliency, a CBDC design should incorporate three key elements: network redundancy, offline capability, and interoperability with other payment systems. For instance, a CBDC based on Distributed Ledger Technology (DLT), if deployed in a truly distributed manner, will not have a single point of failure due to the inherent network redundancy of the system. Ledger balances of the CBDC network could be replicated across the various nodes making up the network ensuring that in the event that one node fails, the network does not collapse since all nodes maintain the state of the ledger. This provides greater resiliency against the concentration risk found in centralized payment systems, which need costlier redundancy methods to remain operational due to risk events. In addition, DLT networks can be permissioned (private) or permissionless (public), with central banks preferring permissioned networks. With permissioned networks, nodes can be deployed and managed by the central bank, and other relevant stakeholders, and data is authorized on the network according to the central bank governance structures implemented. Network redundancy also increases the level of network security in the system by reducing or nullifying the effect of cyber-attacks. A possible future for CBDCs could include a variety of stakeholders, from multiple central bank departments to regulators to financial institutions, all running nodes with functionality that correspond to their institutional mandate. All nodes

should constantly validate the state of the network, but could also be tailored to suit the specific requirements and mandate of the operating institution. One of the main value-propositions of DLT is distributed governance structures, which can apply to CBDC networks. Offline capabilities in a CBDC provide strong operational and cyber-resiliency by enabling transactions to carry on even in the event of a natural or man-made disaster, or major outage in one of the critical service providers. Disruptions are a part of life, whether they are power outages or telecommunication breakdowns due to storms or other phenomena. The ability to function and transact, during such periods, strengthens the resiliency of the CBDC network and the entire payment ecosystem. The Fed can also deploy the nodes of its network in a number of ways to ensure resiliency (e.g. multi-region, multi-zone or hybrid cloud basis). Each deployment has its own advantages. Network distribution should, nonetheless, factor in the ability of entire regions to be affected by an outage and ensure (e.g., with a geographical distribution) that the regions hosting the nodes are insulated from one another as much as possible. Some unavoidable operational and cyber-risks are human error, insider attacks and natural or man-made disasters. Persons can be a major weak link in any security system. For instance, human error, through failures in judgment or lax protocol, can compromise the system enabling unauthorized access by malicious actors. Similarly, an insider attack, where an internal team member accessing the system with malicious intent, can have disastrous consequences for operational and cyber-resiliency. While these human factor risks are unavoidable, they can be mitigated with strong policies and protocols designed to deter or make it extremely difficult to exploit the system. Accountability mechanisms for system users such as: non-editable user-logs which create an audit trail of users and their work in the system, and tamper-detection systems which broadcast stakeholder system alerts when suspicious actions are done in the system, are a few of the ways these risks can be managed. Management controls, such as the separation of decision-making activities from control activities, and the restricting of access to various parts of the system, and where access is valid that there are M of N approvals to enable that access i.e. more than one person must approve an action for it to be effected.

#### *14. Should a CBDC be legal tender?*

The legal tender definition, according to the Coinage Act of 1965, Section 31 U.S.C. 5103, states that: "All coins and currencies of the United States (including Federal Reserve notes and circulating notes of Federal Reserve banks and national banking associations), regardless of when coined or issued, shall be legal tender for all debts, public and private, public charges, taxes, duties, and dues." This means that cash cannot be refused when paying for debts. This is an important endorsement by the government to cash which, consequently, engenders public trust and security when using cash as a reliable means of payment. It also provides stability of value, because cash, as legal tender, precludes the need for cash to be backed by other assets to maintain its value. That trust, as a medium of exchange and store of value, thanks to the legal tender trait, has an extended effect beyond settling debts. This is why cash is regularly accepted, for example in retail stores or supermarkets, even though legally, those businesses could perfectly refuse to accept cash, and instead set-up whatever medium of exchange they deem adequate. Regarding a US CBDC, the Federal Reserve would hope that, if deployed, it is highly and rapidly trusted and accepted. To that end, making it legal tender would be a powerful incentive for swiftly generating a critical amount of trust in a US CBDC as a medium of exchange and store of value. It probably will not equalize the trust embedded in physical cash, due mostly to the tried-and-true history of the latter, but enough for fast acceptance and usage. Hence, the U.S. CBDC should be legal tender. If the Federal Reserve decides to make the U.S. CBDC legal tender, there are issues to consider. First, there is a potential reputational risk in case the CBDC is not widely accepted. With a legal tender status, the Federal Reserve is bolstering the CBDC, and putting its reputation at stake. This is not a minor issue when reputation for the Fed is crucial for managing expectations of the public, and the effectiveness of the transmission mechanism of monetary policy. Second, the issue of financial inclusion could be exacerbated. If the deployment of the CBDC is successful and its acceptance is ample (in part due to it being legal tender), but the design of the CBDC does not tackle the matter of financial inclusion, then unbanked households will likely keep using mostly physical cash. In that case, the downward trends of physical cash usage in the US would not favor these families, in terms of reaping the benefits that come with being financially included and using CBDC. Finally, the Federal Reserve should analyze the possibility of strengthening the legal tender role of cash, be it digital or physical. The current trend in physical cash usage for transactions is downward, and a successful CBDC would accelerate that trend. Eventually, physical cash could be rejected for daily transactions. This is happening already in Sweden, and the Riksbank is analyzing this situation. The Federal Reserve should consider whether it is necessary to amplify the legal tender definition to include transactions other than debt settlement.

#### *15. Should a CBDC pay interest? If so, why and how? If not, why not?*

There are multiple design options for and effects from a remunerated CBDC. From the public's perspective, a positive interest-paying CBDC is more attractive than any zero-interest-rate alternative. It is an almost perfect substitute for deposits, and, as such, its adoption and usage would be faster and more ample, but would deepen the issue of financial system stability given the likeliness of fleeing from deposits to CBDC. The similarity of an interest-bearing CBDC to deposits would make the transmission mechanism of monetary policy more potent and swifter, since, in that case, more money is linked to interest rates under the influence of the Federal Reserve. Moreover, the Federal Reserve could decide to utilize the interest rate on CBDC as an additional monetary policy tool. The Federal Reserve could opt for temporary negative interest rates to deal with recessions. For this policy to be successful, it would have to overcome the zero-lower bound, which is determined by the existence of physical cash. Therefore, the physical cash in circulation should be zero or low enough so that when setting negative interest rates on CBDC, there would be no shift towards a zero-interest rate instrument (i.e., physical cash). In addition, the expectation that there could be negative interest rates could affect adoption of the CBDC in the first place.

The Federal Reserve has more complex options for designing the interest rate to be paid to the CBDC. In addition to a flat positive rate, or a negative one, the interest rates could be non-linear or adopt the form of a fee applied to CBDC not used in specific time-frames to stimulate spending during a recession, or to foster or punish expenditures of particular interest to the central bank. These designs require more analysis, due to their potential welfare and reallocation effects on the overall economy. Besides the designs focused on monetary policy, a CBDC could be remunerated as a countermeasure to potential financial disintermediation and bolster financial stability, but this requires a particular design. One option is a multi-tiering remuneration scheme, in which the remuneration applied to the CBDC depends on the amount held above a certain level the CBDC pays a lower interest rate (which could be negative in times of stress). Furthermore, this multi-tiering design could include limits on daily transfers. Additionally, differences in frameworks (i.e., limits on CBDC holdings, applied interest rates, or combinations) could be imposed depending on which entity holds it: business and households. Framework disparities could be based on exhibited excessive take-up or variability in holds of CBDC. Importantly, some of these measures could be temporary, which could be deemed necessary during the implementation phase of the CBDC or in a crisis. In conclusion, the Federal Reserve currently has many tools to conduct conventional and unconventional monetary policy. Therefore, this should not be a reason to remunerate the CBDC. The design for reducing disintermediation could be useful and has a valid motive of implementation. However, it would be better not to add too much complexity initially to the CBDC. Therefore, the CBDC could start without remuneration, which will allow the Federal Reserve to earn experience and knowledge managing its digital currency, but with the technological and legal possibility to add in the future a more complex design, such as a multi-tiering approach.

#### *16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Setting a quantity limit on the individual amount of CBDC will help mitigate the risk of significant migration from deposits to CBDC. This is especially important if the CBDC pays a positive interest rate, thereby becoming more attractive for business and individuals to hold.

However, a cap on CBDC amount per individual introduces frictions in its role as part of the payment system. For example, there is a risk that a payment is rejected, due to the receiver having reached the CBDC limit, unknown to the payer in advance. A possible solution to this issue is to institute a waterfall mechanism, by which any excess beyond the limit is accepted but transferred to a linked bank account, or, perhaps, held in smart contract escrow until the wallet balance is diminished. Tiered wallets have become the norm for CBDC infrastructure solutions, typically increasing the amount of KYC required to be collected by end-users as holding and transaction limits increase. Some monetary authorities are considering implementing a base-tier wallet with minimal KYC requirements (e.g. Email address) and minimal transaction and holding requirements that would not be a concern in the context of AML or CTF, but could facilitate small payment use cases such as groceries, bus fare, or other items. This design could play a role in achieving financial inclusion, especially in situations where individuals may not have the necessary KYC documentation required for higher tier wallets. In summary, capping the amount of CBDC held by a single user has important advantages, and is a valuable option to be added to the design of the CBDC that could be activated if needed. It is also easy to understand, compared with a multi-tiering interest rate design, is transparent, and reduces uncertainty to banks and central bank alike.

#### *17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

An intermediated CBDC would foster diversity and innovation from the participant firms in

terms of provision of payment services associated with the digital currency. Intermediaries should be firms that can provide the technology to enable stakeholders, of all types, to perform a variety of CBDC transactions, allow users to pay through offline processes, and to execute transactions between multiple type of wallets (including competing firms'). Therefore, besides commercial banks, intermediaries should include other non-banking payment service providers or fintechs that have developed solutions that meet well-defined standards for integrating with the CBDC network. Standards should include both technical and AML Compliance requirements. Technical standards are required to ensure that functionality is consistent and that there are no risks to user funds. App marketplace standards are a comparable example for standards that intermediaries should abide by when successfully integrating with a CBDC network for payments. AML Compliance standards can be applied based on requirements set forth in regulations, but also demand adequate protections of user information, especially PII.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

The ability to conduct a secure offline transaction is an important element to improve financial inclusion. Research shows that unbanked households (5.4% of total households as of 2019) are more likely to have limited or no access to home internet, a smartphone, or a cell phone service. The 2019 FDIC Survey of Household Use of Banking and Financial Services corroborated the latter. Specifically, two of the main reasons cited for being unbanked were "minimum balance requirements", with almost one out of every three households citing this reason, and "fees too high". Having a low-cost method of payment, whether it be a minimum balance wallet tier or an offline capable card, could offer a new way for the financially excluded to transact in a powerful and digital manner. An offline solution could act as a backup should internet disruptions occur. With offline capabilities, a CBDC could serve as a backup in instances where the cloud is down, the mobile network is not working, or there is a power outage. There are multiple examples of outages occurring for similar reasons, for example: the Amazon cloud failure in December 2021, or the Facebook outage in the same year, concurrently bringing down WhatsApp, Messenger, and Instagram for about six hours. Mobile networks could go down for a myriad of reasons related to hardware (equipment malfunctions, a fire, a storm) or software (coding errors, a hack). In addition, an offline solution could offer a lifeline during outages caused by negative weather conditions. Different segments of society will have differing requirements and benefits for the introduction of an offline solution. For example, those living in remote areas without electricity and/or internet infrastructure and those living where it is inconsistent. An offline solution that meets the requirements of all users could mitigate future outages. Offline capabilities can be achieved in three ways: Offline digital cards, SMS or USSD (Unstructured Supplementary Service Data) transactions, and software solutions. As for the first option, these cards would be completely self-contained and tamper resistant, with their own power source and using Bluetooth or Near-Field Communication (NFC) to send and receive CBDC. The cards could be issued by an established agent, like a financial institution, or another approved entity, and could be preloaded, with CBDC, by the issuer who also performs the Know Your Customer (KYC) checks. The card would be programmable and could be installed with smart logic that enforces regulatory requirements or restrictions such as transaction limits on spend or maximum amount of CBDC to hold. Finally, all transactions between users would be encrypted. SMS or USSD transactions would allow users to make banking transactions on their feature phone without any access to internet connectivity. Finally, software-based offline payment solutions function by allowing a wallet user, when online, to allocate an amount of CBDC specifically for offline use. This amount is segregated and held separately to be used in the event the internet or cell network is unavailable. More specifically, for Bitt's offline payments software solution, a wallet owner allocates funds from their online wallet to their offline wallet. These funds, referred to as claims, are segregated from the online wallet balance by Bitt's offline system to prevent double-spend using immutable data structures. Claims may be sent to other CBDC wallets via NFC, QR code, Bluetooth, or other means available, in an offline scenario. Transferred claims may be spent by the receiving parties, but ultimately must be settled on the online system when connectivity resumes. Additionally, claims can be programmed to have expiration dates and will eventually expire, and, in that case, they will automatically return to the owner's online wallet.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

The ability of money to act as a medium of exchange, and thus pay for goods and services, constitutes one of money's basic but central functions. Money in the form of a CBDC should consequently provide the same utility by enabling the public to conduct commerce in very much the same way that cash and other forms of payment are currently used at the point of sale (POS). This scenario would enable the widest possible acceptance of the CBDC from both consumers and retailers. It is worth noting, however, that although CBDC acceptance at

the POS is important, a CBDC enables far more e.g., online purchases, use in virtual environments (such as games), and other situations where physical cash simply cannot go.

This would be particularly important for financially excluded households. According to the 2019 FDIC Survey of Household Use of Banking and Financial Services, inconvenience of bank hours and bank locations are two of the main reasons for not having a bank account. Therefore, the convenience of being accepted at the POS is an attractive design for this segment of the population. In terms of ease of usage, consumers must be able to spend their CBDC balances at a retail POS without frictions, ensuring, for example, that government payments made via CBDC to the vulnerable or financially excluded would not present an additional barrier to those persons in the utilization of these payments. In general, ease of usage would require intensive cooperation between the Federal Reserve, CBDC intermediaries, and retailers participating in pilot projects, in an iterative way, so that optimal processes are chosen. A pilot project is a robust mechanism for evaluating and addressing the myriad issues which can accompany the move to a CBDC. Intermediaries and retailers could receive support in the form of technical assistance, operational support and training. The entire process, from onboarding customers to the use of CBDC under a variety of use cases, can be monitored, evaluated, and adjustments made to suit the requirements of the Federal Reserve prior to a wider deployment in the economy. In that regard, it is crucial to consider the characteristics and needs of both consumers and retailers to ensure that a healthy ecosystem is achieved (i.e., enough merchants willing to accept CBDC, but also enough consumers who want to use it). On the consumer side, CBDC design needs to accommodate the different categories of end users (e.g., low-income) and should be widely available in ways that are accessible and easily distributable to all. To that end, in addition to digital wallets, CBDC should be made available via other instruments such as digital cards, vouchers, SMS, which is still widely used in the US, and the incoming Rich Communication Services (RCS). This could cover the full spectrum of socio-economic levels of the public and ensure that those who are most in need of the benefits of a CBDC have access to it in a low-cost, user-friendly manner. On the retailer side, the acceptance of CBDC as a means of payment is concerned with the extent of adoption by consumers and cost of accepting it: initial investment and ongoing costs. For the former, CBDC design should encompass the ability to interoperate with existing payment infrastructures in use by merchants, or operate using smart devices, and, where technology upgrades are necessary, subsidization of these upgrades via rebate programs could be implemented. Transaction costs should be minimized (entrepreneurial services are expected to arise and take up the mantle in terms of cost-minimizing innovations), and, at the very least, bring a reduction relative to other accepted payment methods.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

For CBDC to be transferable across multiple payment platforms, there should be mechanisms for the transfer and exchange of payment information across the various platforms. Currently, transferability is achievable in several ways. Firstly, by having common standards; secondly, through the establishment of a single, multi-currency payment system; and lastly, via the use of technical interfaces that interlink different payment systems. Common standards consist of much more than technical specifications. They also encompass other factors such as data and messaging standards, identity and authentication, security, legal and regulatory frameworks (BIS, 2021). Having a common set of standards would yield the greatest benefit; however, it is by far the most difficult to put into practice. The complexity required to coordinate disparate systems, technologies, and legal and regulatory frameworks makes designing common standards a lengthy and long-term process. Devising common standards may also be difficult due to legacy systems operating on antiquated technologies. A single multi-currency CBDC platform would preclude the need for data integrations, since there would be one system with one data and messaging standard. Access requirements for all participants on the portal would be the same enabling uniformity in compliance regulations.

The use of technical interfaces is an option that enables CBDC transferability without the need for implementation of new technology or new technical standards. Presently, Bitt, through its use of application programming interfaces (APIs), software development toolkits (SDKs), and other software suites, enables integration with existing financial infrastructure such as core banking systems, national payment infrastructures, and international payment infrastructures. The national payment infrastructures supported are ACH, RTGS, Real-time payment, card networks, and ATM/Teller. Bitt's Digital Currency Management System (DCMS) also integrates with international payment infrastructures such as SWIFT and CBDC Universal Bridge to permit transferability in the cross-border payments space. The DCMS also supports REST-based interoperability with existing national systems. Lastly, by supporting the standardization of current messaging formats to meet the ISO20022 standard, CBDC solutions can ensure complete interoperability with legacy and new financial systems worldwide. Interoperability, in itself, is a complex issue that takes into account a myriad of conditions. However, given that digital currency is essentially "identity with a value", a key

supporting factor for transferability to occur is a trust framework based on identity management and verification. An accepted digital identity facility, independent of payment platforms, could provide a base level of standardization enabling authorization of transactions across multiple systems. Alternatively, the Federal Reserve, in its role as chief regulator of the financial and payment, can mandate a minimum technical specification for all payment platforms that would allow integration and acceptance of CBDC. A broad consensus of industry players, with guidance and input from the Federal Reserve, could be constituted to achieve this. Key items to be addressed would be settlement procedures e.g., atomicity of transactions; KYC/AML requirements, since this may differ depending on payment platform; data sharing; who bears the cost of the integration; and consumer privacy, although a transfer of CBDC does not mean a transfer of private customer information.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

The future is notoriously difficult to forecast, however the following future technological innovations could dramatically transform CBDC design and policy choices: Developments in Self-Sovereign Identities (SSI) have the ability to impact CBDC design approaches to managing customer privacy with respect to CBDC transactions. For example, KYC requirements and the need to collect information from customers could be vastly reduced with an SSI. In this scenario, only the verifiable credentials and information necessary to complete a transaction are required to enhance customer privacy and reduce the regulatory burden for businesses. Advances in quantum computing represent risk and opportunity to the underlying cryptography that is inherent in a CBDC system, particularly blockchain-based systems. Encryption is based on the premise that computers currently need an inordinately long time to factor large numbers. Quantum computers have the ability to accelerate the rate at which encryption could be cracked which could simultaneously impact security and the trust built up in these systems. Work is already underway to mitigate these effects and create quantum resistant systems. The development of the Metaverse, and its impact on the real and virtual worlds, represent additional risks and opportunities for the design and policy choices of a CBDC. The Metaverse allows for unique social interactions in a virtual landscape that are still being developed and refined. For instance, how commerce is conducted in this virtual space will have a spillover effect into the real world and potentially create innovations and structures that could fundamentally alter how CBDCs are designed, used, and regulated.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

A CBDC system should be designed to support innovation and competition. In that sense, the CBDC system should be able to build additional innovative services on top of its infrastructure, and the system itself should be built to be flexible and accommodate a dynamic future demand for digital currency. In addition, regulation should ensure that entry barriers are minimal (which is important for small firms or firms with fewer resources, and non-banking firms), and without unintended elements that could foster oligopolies or monopolies. Two important design principles that are intertwined are inclusiveness and efficiency. From these two principles, the CBDC should be intuitive, user-friendly, accessible, fast, transparent, low-cost, and reliable (i.e., capable of being used and transferred anywhere, at any time, even offline). While this will largely be taken care of by intermediaries, underlying transaction network functionality will likely need to evolve to achieve future use-cases. However, there a tradeoff between achieving a low-cost usage of the CBDC and financial inclusion. CBDC transactions will need to be processed and that involves costs. The Federal Reserve may want to shield the public from these costs, especially financially excluded households. However, intermediaries should be able to earn profits, otherwise innovation would be stagnant. The design of the CBDC, in relation to the operating model, thus entails a balancing act for the Federal Reserve to provide a fair and cost-effective system to the public with an adequate cost-recovery mechanism. Additionally, being operational and financially resilient is a crucial design principle. The CBDC should be shielded against cyber-attacks, or fraud schemes. The CBDC should also consider potential impact on the financial system and monetary policy, and explore safeguards to build into the CBDC to address these risks.

Finally, a CBDC should be designed to be energy efficient and environmentally friendly. This design principle would set the bar in terms of how a payment system could use energy optimally (e.g., carbon-neutral). Notwithstanding, it could pose a challenge, since a CBDC, while having the ability to provide faster, less costly transactions, may also do so at the expense of energy efficiency, thereby creating negative externalities.

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*Name or Organization*

*Industry*

*Country*

United States of America

*State*

Minnesota

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The benefits are multi fold

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes; It would require going back to a gold back system

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

It would be a positive effect on financial inclusion

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

It would make it easier to shift policies dependent on what is required

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Positive

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

It would be backed by the gov rather than traditional debt or other assets that could be manipulated by the market.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Open Sourced Non Profit that could be publicly audited.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

They will dominate the US Dollar. If the US doesn't get on board with crypto soon it will be left behind and won't be able to keep its control over what the world uses for trading goods/services.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Slow to Adopt Fast to Kill. Everyone is looking for a more reliable method of transfer, The

entire world saw the ineffectiveness of sanctions on Russia, this should not be taken lightly as the US failed. CBDCs would allow interoperability between currencies easily. An open source non profit network that could be used by everyone would allow the US to stay on top.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Yes many.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

By using muxed accounts. A muxed account is an account that exists “virtually” under a traditional account address (Think Bank and bank accounts) and can be used to distinguish multiple “virtual” accounts that share an underlying “real” account. The bank will know the owner of the virtual accounts and record the transactions on its real account. All transfer would look like they are coming/going to a handful of wallets but those wallets (banks) will have complete record of all transactions, making auditing a simple compared to current methods.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

24/7/365 trading. You can stop the markets now a CBDC will need to trade 24/7/365 with 99.99% uptime and no chance of blockchain splitting or rolling back. It will also require finalized transactions not just confirmed blocks.

*14. Should a CBDC be legal tender?*

Yes. The world is moving digital and CBDC should be accepted everywhere like a debit/credit card today.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Yes. Just like the US Dollar, CBDCs will need more in the future. Today the Treasury offers interest to print additional dollars and CBDCs should be the same, though automatic. It is also a great incentive for holding the US dollar via CBDC.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Yes. We are seeing the issue of money driven people destroying the world this can and should be limited and applied equally to everyone and every corporation, especially with how taxes are setup.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Banks and credit unions. The same rules and regulations for CBDCs as for the Dollar.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes; It can be achieved using SMS on even the most basic phone networks to ring the transaction to a server that will publish the transaction as it's received. Else Satellites can be used to keep blockchains in "sync" if world fiber optics were cut/sabotaged.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes of course. You simply design the interface in a simplified way for the end users; similar to how phone payment system work now.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

In order to be cross blockchain compatible you would need to implement trustless anchors to each blockchain or to another chain that is already has trustless anchor to other blockchains.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Like the checkbook revolutionized payments over cash, The same will happen with CBDC over traditional fiat. Once the rules and regulations are set, clear, and fair, the world will flock to CBDCs.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

The CBDC should be on a blockchain that is capable of offering fast block times, block finality, and one that would halt rather than fork or else have the possibility of the chain rolling back or splitting and causing mass loss. To be trusted by the people the blockchain will need to be open sourced for public auditing of code and non profit to ensure the people are getting the best rate and offer confidence that the user isn't being front run with potential to lose their funds.

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The policy benefits of a CBDC when the program is designed correctly. The large segment of consumers who are not financially included can be included in the financial segment of the economy. If CBDC currencies are granted to consumers where savings and interest rates are established for specific time-periods. This would be for segments of the population with specific annual income criteria. A policy could also be for millions of undocumented immigrants once Congress resolves disputes allowing them to become documented and are eligible for CBDCs. The policy benefits of CBDCs for cross-border digital remittances when they are available. The remittances could benefit immigrants that use CBDCs as a source of value for sending to beneficiaries to recipients in destination countries such as Latin America, Philippines, India, China, Pakistan, Cuba, and other countries where their family members reside. Referenced on page 9 in the "Federal Reserve Bank's Money and Payments: The U.S. Dollar in the Age of Digital Transformation January 2022" is a quote "High costs for cross-border payments also affect smaller businesses that make infrequent global payments to suppliers. Reducing these costs could benefit economic growth, enhance global commerce, improve international remittances, and reduce inequality.<sup>12</sup> The policy considerations would alter the flows of economic activity by reducing the price of each transaction to each immigrant that would reduce the cost of cross-border digital remittances by significant sums. The revenue implications reduce the income of major cross-border digital remittances (money transfer) companies such as Western Union, Moneygram, Xoom, (a PayPal service) and others. These cross-border digital remittances would be in various formats; all would be proprietary. The risks include income loss from VISA, Mastercard, Western Union, Moneygram, banks, and non-financial service providers. The income loss is due to interchange fees and fees related to account-to-account transfers. This may not be a risk necessarily, but a loss of income to the economy.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

In the policy benefits questions requested in item 1, Anza was asked of potential benefits of CBDCs. One response was cross-border digital remittances for undocumented immigrants. There was a question in 9 in this document of cross-border digital that I assumed regarded remittances (money transfers) on behalf of consumers and businesses, a portion of the CBDC product suite. Anza would like to offer this feature is a potential benefit of a CBDC. It cannot be offered in a different manner. This feature should also be offered to all consumers and businesses. The product features of CBDCs as a whole operate as an "currency like" account without the burdensome features of commercial banks, credit unions, regional banks, financial institutions, and other companies. They provide payments services to businesses, utilities, persons, and store of value for individuals in a rapid manner with few charges. No alternative could occur without the act of government and private enterprise.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

The CBDC would have a positive affect for financial inclusion if designed by a specific implementation. The FDIC's 2019 5.4 % survey of US household's means 7.1 million were unbanked lacks a checking or savings account at a bank or credit union. According to the Brookings study the Treasury Departments - Federal Reserve Bank would not be an ideal

solution (here). A more ideal solution would be a non-financial solutions provider that would provide interfaces to the Treasury Departments - Federal Reserve Bank with account "like" services with the potential of moving to the commercial banking sector when the citizen was trusting and bankable.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

The effects of maximum-employment and price-stability goals due to monetary policy from the Federal Reserve Bank's use of CBDCs are unknown, although thought to be minimal in the short term. The effects of employment will shift over time due to potential reduction in workforce in employees from commercial banks, credit unions, regional banks, financial institutions, and other companies (interchange / account transfer / bill pay - pricing) and an increase in employment for health care companies, manufacturing companies, and leisure companies. The Federal Reserve's ability to effectively implement monetary policy depends upon the personal behavior of the habits of those who use the CBDC. Anza believes the CBDC will have a positive impact on maximum-employment and price-stability goals in the medium to long term.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

The effects of CBDC financial stability are unknown as a follow-up to question 4 in this document. The Federal Reserve's monetary policy pursuit of maximum-employment and price-stability does affect financial stability. The net effect for financial stability is positive in the medium to long term.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

The CBDC could affect the financial sector: The CBDC could affect the financial sector from stablecoins or nonbank money:

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Cash will always be necessary for the general public for technical disruptions.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

In the absence of a US CBDC, digital payments evolved in the US with products by Western Union, Moneygram, Zelle, Venmo, VISA, Mastercard, others, and soon FedNow. A recent study conducted by the Federal Reserve Bank of San Francisco produced a report, <https://www.frbsf.org/cash/publications/fed-notes/2022/may/2022-findings-from-the-diary-of-consumer-payment-choice/> that provided the following: Consumers continued to use credit cards and debit cards for a majority of their payments, accounting for 57 percent of total payments in 2021 compared to 55 percent in 2020 and 54 percent in 2019 (Figure 1). This increased share of card use was because the number of cash payments declined from 10 in 2019 to 7 in 2021 and not because card use increased. In absolute terms, the aggregate number of card payments (debit and credit) declined from 23 payments in 2019 to 21 payments in 2021.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The United States should develop the CBDC as it is currently, with questions gathered from professionals including economists, policymakers, bankers, technologists, lawyers, regulators, and others. No other nation should influence the United States on whether it should issue the CBDC.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

The risks of the CBDC as a matter of design. It is unclear how the CBDC is designed. How

are the funds deposited to the account / currency? Is it truly an account? Where is the account? How are the accounts accessed? Are the funds deposited to the account? By whom? How much? How are they accessed? Via a card, digital wallet, mobile phone, Smartphone? How is the consumer / business registered? How are payments made? The risks are technical with connectivity issues related to operator and password issues and interoperability issues with connections between systems. Does the consumer access the CBDC via debit card, mobile phone – Smartphone, or PC – Laptop, or does the consumer have access to a CBDC without full anonymity?

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Registration of a domestic CBDC is unnecessary for a consumer activity allowing for facilitating illicit financial activity for US money laundering guidelines. For CBDC cross-border digital payments consumer registration will be necessary for facilitating illicit financial activity for BSA / AML compliance guidelines.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

CBDC operational and resiliency and cyber risks and services supported by expert Security, Network, and Encryption professionals. They must be consulted when the system is designed, implemented, and supported.

*14. Should a CBDC be legal tender?*

CBDC should be legal tender.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

CBDC should pay interest for those with income levels less than \$29,999 to incentive consumers to learn a trade, to become bankable, or both. The CBDC program should be designed where the Federal Reserve is not involved in providing “interest” to consumers. The CBDC program should be designed where the Federal Reserve should outsource to a third party that provides “interest” as a licensed FDIC provider of services. The “interest rate” should be agreed upon by repudiable global economists.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Single end-user should not be held to any quantity limits for no amounts.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Intermediaries should provide the role of financial firms or non-financial firms. They should be licensed by the US Treasury, FDIC, FINCEN (depending on the CBDC cross-border digital payments product) and other licenses for commercial banks and non-financial firms to operate in the United States.

*18. Should a CBDC have “offline” capabilities? If so, how might that be achieved?*

CBDC should have offline capabilities in the case of technical outages.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

CBDCs should be designed to support the point-of-sale. Consumers and business would have the option of choosing to accept a card, mobile device or Smartphone. There are several POS solutions in the market with contactless, striped, QR codes, among others. There are several hardware vendors that require software solutions with multiple versions of software.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Several payment platforms exist. From a product perspective by category domestic CBDC digital account transfers, bill payment and online shopping, and others. From a product perspective by category international CBDC digital cross-border account transfers, bill payment and ecommerce. Interoperability is necessary to achieve transferability across

multiple payment platforms for CBDC to access each one. From a technical perspective domestically and internationally, CBDC architecturally must be carefully designed to ensure it retains structurally to meet the needs of the consumers and businesses long term. A number of countries have started and / or implemented CBDCs and it would be best to collaborate with professionals to determine their experiences and the technical solutions they have designed and implemented. We have experience with several innovations domestically with networks and standards, recently blockchain, the Federal Reserve sponsored work that developed FedNow, SWIFT's work with SWIFTnet, ACH and their rapid evolution with their ACH products, recent evolution of programming languages – JavaScript, C++, Go), several wallets. Interoperability with CBDC cross-border digital payments being difficult due to the corridors having multiple formats mapped to several consumers in multiple countries based on different companies. Economies of scale could be achieved by providing all CBDC cross-border digital payments using one technical standard and having one intermediary map to every non-standard route to several consumers in multiple countries based on one price and one FX-rate at one low-price.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Those in charge of ensuring professionals have the technical vision, policy, innovation, and personality to run things smoothly will keep CBDCs soaring.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Anza lacks the time to offer detailed design principles other than general principles, they are: Consumer CDBC Balance 1) Load value on the database (anticipated) a) by email b) by phone number c) card with number d) mobile device with number e) Smartphone device with number f) wallet with number g) Use to pay bills, provide account transfers, provide POS purchases h) For Cross-border transfers to consumers in countries Business CBDC Balance Consumer CDBC Balance 2) Load value on the database (anticipated) a) by email b) by phone number c) card with number d) mobile device with number e) Smartphone device with number f) wallet with number g) Use to pay bills, provide account transfers, provide POS purchases h) For Cross-border transfers to consumers in countries

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

"Money is the one thing we all need to survive in society. We know we need it, we know that at least half of us don't have enough of it, yet we don't know how and by whom it is created. U.S. printing presses physically make some of our money, but our government does not create it. People, Planet & the Power of Money reveals who creates our money and how they do it. It also provides examples in our own history of a just, democratic system of money that we can easily put in place today, ensuring all Americans the opportunity for successful and rewarding lives. "Both people and planet are overwhelmed with crises from climate change, dying species, oceans and ecosystems to pandemics and potential economic disaster. Based on justice and history, only the ancient lost power of publicly created money can deliver money in sufficient amounts to heal our planet and ourselves." [People, Planet & the Power of Money (PPPM) by Nick Egnatz is due out on Amazon in June, 2022] We need to have a heartfelt national discussion on what the nature of money is and whether or not we should keep our present bank-created debt-money system or change to a system of publicly created money. The Federal Reserve itself admits that "After touring Europe to study its banking systems and techniques, [Senator Nelson] Aldrich and the other commissioners [National Monetary Commission] returned convinced that the United States should have a central bank controlled by bankers and issue notes based on commercial paper." [ Federal Reserve Bank of St. Louis, "Banking Reform 1907-1913"] Commercial paper is an unsecured common form of short-term debt issued by a corporation. The National Monetary Commission then published 24 volumes of research, that ultimately led to the creation of the Federal Reserve System by Congress in 1913—all done without defining the nature of money. Our present bank-created debt-money system is based on the concept that money is a commodity such as gold and silver, historically procured by humans enslaved by those in power to mine the gold and silver for them. PPPM relates the story of Europeans sent to the loot the gold and silver of the New World to transfer their human slavery to our debt slavery to a bank-created debt-money system in Europe that was eventually replicated in America. "It started with goldsmiths. As early bankers, they initially provided safekeeping services, making a profit from vault storage fees for gold and coins deposited with them. People would redeem their "deposit receipts" whenever they needed gold or coins to purchase something, and physically take the gold or coins to the seller who, in turn, would deposit them for safekeeping, often with the same banker. Everyone soon found that it was a lot easier simply to use the deposit receipts directly as a means of payment. These receipts, which became known as notes, were acceptable as money since whoever held them could go to the banker and exchange them for metallic money. Then, bankers discovered that they could make loans merely by giving their promises to pay, or bank notes, to borrowers. In this way, banks began to create money. More notes could be issued than the gold and coin on hand because only a portion of the notes outstanding would be presented for payment at any one time...Transaction deposits are the modern counterpart of bank notes. It was a small step from printing notes to making book entries crediting deposits of borrowers...thereby "printing" their own money." The above from Modern Money Mechanics, Federal Reserve Bank of Chicago, printed from 1961–1994, describes the process of fraction reserve lending by which banks historically would create money, allegedly backed by gold in their vaults, for amounts vastly in excess of the actual gold in their vaults. The only word that properly describes the above money system is fraudulent. We are not told that the banks create our money out of thin air and then loan it to us at interest. The banks can only do so because all the other banks in the system are doing exactly the same thing and because the Federal Reserve Banks (owned by the private banks

within their districts) move around reserve money after the money creation has taken place. Money is an exclusive, abstract, social power of the state, which acts as a final means of payment, facilitating commerce, enabling all our people to have meaningful lives, and being there for us to confront the momentous crises that will inevitably arise in the future and it is high time our nation treats it as such. A just system of publicly created money would actually be representative of the way most of us intuitively and mistakenly believe our money system is now: 1. Our federal government creates our money. 2. Banks loan us money that has already been created by our federal government. 3. The Federal Reserve Banks are a part of our government. These 3 reforms will give us a just system of publicly created money.

2. *Could some or all of the potential benefits of a CBDC be better achieved in a different way?*
3. *Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*
4. *How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*
5. *How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*
6. *Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*
7. *What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*
8. *If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*
9. *How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*
10. *How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*
11. *Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*
12. *How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*
13. *How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*
14. *Should a CBDC be legal tender?*
15. *Should a CBDC pay interest? If so, why and how? If not, why not?*
16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*
17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Over \$2 trillion worldwide has been invested in the crypto economy. These digital assets are increasingly being used as a form of payment, with varying degrees of operational, settlement and liquidity risk. Wespay believes a U.S. Dollar (USD) CBDC could enable financial institutions to provide a safe, digital payment alternative to cryptocurrencies for consumers and businesses while providing BSA and AML safeguards. Wespay members believe a policy is needed to ensure a CBDC is fungible with a one-to-one fixed exchange rate to the USD, minimizing opportunities for the private sector to arbitrage between the physical and digital USD currencies. A range of potential CBDC risks are identified by Wespay members. Keeping the digital assets secure from cyber threats is a top concern. A more fundamental concern relates to the disintermediation of commercial deposits and implications to retail and small business lending.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

No response submitted.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Responses to Wespay's member survey indicate no consensus on the potential effect of CBDCs on financial inclusion. Only 24% of members surveyed believed CBDC would have a positive effect on financial inclusion, with 31% neutral or unsure, and 38% believing CBDC would have a negative impact. There are concerns that a CBDC would increase the technology requirements for participation, which could present a barrier to participation, and become a deterrent to a segment of the population. Privacy is another concern for some unbanked individuals and a CBDC solution would not mitigate those fears. Also, if a robust CBDC solution were delivered by non-bank intermediaries, expansion of the program could cause individuals to discontinue existing banking relationships. Robust education campaigns would be needed to help explain CBDC to the unbanked and underbanked to help overcome these concerns.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

No response submitted.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Wespay members generally agree that a well-regulated CBDC will provide a safer, more stable alternative to cryptocurrencies, which are largely controlled by the private sector, are highly volatile, and have a nascent regulatory framework. Wespay believes a CBDC could be a viable, digitally native payment option that would be nearly universally accepted and trusted. Without appropriate safeguards, Wespay members are concerned a CBDC could introduce credit disintermediation risk, resulting in negative implications to consumers and small businesses.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Responses to Wespay's member survey identified cybersecurity as the top risk CBDC poses to the U.S. payments industry, followed by consumer privacy risk, and then reduced commercial bank deposits. If financial institutions do not have the ability to lend on CBDC balances, it will result in lower available credit. The potential shift from commercial bank liabilities to central bank liabilities will directly reduce financial institution funding and result in credit disintermediation. Financial institutions will have less access to low-cost deposit funding or be forced to raise rates.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Wespay members believe that a CBDC has the potential to be a valuable digital payment instrument, and suggest the Federal Reserve prohibit associated benefits that create competition with commercial bank deposits. To mitigate the risk to commercial bank deposits, Wespay members support the Federal Reserve establishing two policies: 1. CBDC accounts should be non-interest bearing to safeguard the value of established short-term instruments, which are used to fund retail and commercial lending. 2. CBDC should have a fixed one-to-one exchange rate to the U.S. Dollar to minimize opportunities for the private sector to arbitrage between the physical and digital USD currencies. Wespay members agree with the Federal Reserve's stated concerns that interest-bearing CBDC accounts could increase CBDC demand, reduced commercial deposits, and drive higher bank funding costs. Households and businesses could be directly impacted by reduced credit availability and higher costs.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Responses to Wespay's member survey clearly indicate that a CBDC will have strategic economic value for the U.S. Dollar. Nearly 74% of respondents to the survey ranked U.S. leadership in the global monetary system as an important consideration, while 24% of respondents believe a CBDC will have a positive impact on U.S. payments. Nearly 38% of respondents expressed uncertainty of the ultimate impact of a CBDC. (Note, response rates exceed 100% as the survey allowed high priority scoring with more than one answer.)

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Wespay believes that U.S. payment systems are robust and continue to evolve to meet the needs of consumers and businesses. Recent innovations in faster payments, and the introduction of instant payments, represent incremental utility to payment system users while maintaining integrity, trust, and safety in our financial infrastructure. However, we cannot ignore the growth of cryptocurrencies, which are being used for value exchange on digital platforms. Many of these cryptocurrencies are highly volatile and largely unregulated. Continued cryptocurrency growth could present new risks to a growing percentage of the U.S. population that are participating in these systems. A USD-CBDC could be a viable digital alternative that would allow financial institutions to act as intermediaries and provide BSA and AML safeguards for all participants.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Responses to Wespay's member survey indicate that 74% of respondent believe the most important benefit of the U.S. implementing a CBDC would be to maintain its leadership role in the global monetary system. However, it is not clear how the implementation of a CBDC helps the U.S. to maintain that leadership position. Wespay members do not believe the CBDC attributes of speed and frictionless exchange will increase the attractiveness of the USD in its reserve status. Are there additional features of a USD-CBDC that will result in superior capabilities of the digital currency versus other payments alternatives? It is critical for the Federal Reserve to communicate the benefits of a USD-CBDC that will incent adoption and ubiquitous acceptance globally.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

No response submitted.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

No response submitted.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

No response submitted.

*14. Should a CBDC be legal tender?*

No response submitted.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Wespay recommends that a CBDC be non-interest bearing to safeguard the value of established short-term instruments used to hold commercial deposits. By maintaining a CBDC with a one-to-one fixed exchange rate to the U.S. Dollar and no interest accrual, the Federal Reserve will minimize opportunities for the private sector to arbitrage between the physical and digital USD currencies. Wespay members agree with the Federal Reserve's stated concerns that interest-bearing CBDC accounts could increase CBDC demand, reduced commercial deposits, and drive higher bank funding costs. Households and businesses could be directly impacted by reduced credit availability and higher costs. As this initiative advances, Wespay members request the Federal Reserve to clarify whether the accrual of interest applies to an intermediary's account with the Fed (i.e., wholesale CBDC) or the customer's account with an intermediary (i.e., retail CBDC).

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Wespay members believe that CBDC accounts should be subject to quantity limits or caps to minimize shifts from commercial bank deposits to central bank deposits. However, some Wespay members are concerned that quantity limits for end-users may limit the viability of a CBDC to protect the U.S. Dollar's role as a global reserve currency.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Responses to Wespay's member survey indicate that 71% of respondents believe that only licensed and regulated financial institutions who currently offer central bank and commercial bank-based financial services have the necessary experience to intermediate CBDC. This supports the current U.S. financial structure where non-financial institutions do not have direct access to central bank funds. Wespay members recommend that the Federal Reserve focus on implementing CBDC for current central bank account holder intermediaries and explore what changes would be needed for additional categories of intermediaries over time. Wespay members believe that if a CBDC is available to non-financial intermediaries, it is critical to ensure that these entities are held to the same levels of regulatory compliance as financial institutions. This will ensure a level playing field and help to instill trust and confidence for all users in U.S. payments systems.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

No response submitted.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Wespay members believe the payment solutions currently available at the Point of Sale (POS), which include cash, are satisfactory and provide consumers with adequate choice. Digital currencies hold the greatest potential for innovation in online environments as a means of value exchange for digital assets. In terms of improving financial services for the underserved, a CBDC solution operable at the POS could be a more secure payment option than handling cash. Larger purchases that require a significant amount of cash can lead to greater risk of physical assault and possible loss in mishandling.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

No response submitted.

21. *How might future technological innovations affect design and policy choices related to CBDC?*

No response submitted.

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

No response submitted.

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*Name or Organization*

American Monetary Institute

*Industry*

Consumer Interest Group

*Country*

United States of America

*State*

Illinois

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

This survey response aims to look at CBDCs within the context of the major challenges facing us today: pandemics, war, pollution, and climate change. The Fed needs a broader outlook with increased responsibilities to reach its potential to help combat all of these. Ultimately, the Fed will need to be aligned with other central banks and the BIS to work with governments and the U.N. to promote economic harmony here-to unseen. While CBDCs will be a focus of this paper, digressions will be commonplace. It is hoped this can be the start of a deeper relationship to look at the possibilities for a better world. Not raised in the "Money and Payments..." paper is how a CBDC comes into circulation. One way is for money to be initially issued/created through a loan or investment on the part of a commercial bank. A depositor at that bank withdraws money, moves it over to their Fed account, and obtains CBDC. Another way is for the Fed to decide how much money can come into existence. That amount of money can be purposed by Congress to be loaned or spent into circulation. The American Monetary Institute (AMI) policy is that commercial banks are to be weaned off all credit-originated money and indeed become true intermediaries between depositors (who want to invest their money at interest) and borrowers. At this point, the Fed would have greater influence and control over the amount of money - digital and paper money - in domestic circulation. We can call the Fed originated money social equity money for educational and practical purposes. It need not be considered a liability but definitely would have to be issued in that sweet spot between inflation and deflation. Along this path one scenario (and there are other viable possibilities) for how deposits at commercial banks can be handled is as follows: depositors would have a choice to earn interest or not. Depositors wanting to earn interest would be told they are making an investment, and investments involve risk. Depositors still interested in investing could choose to obtain a high, medium, and low-interest rate for their investment. For example, investing in uncollateralized credit cards would earn a high-interest rate. Investing in people's collateralized mortgages could earn a medium interest rate while investing in commercial paper with certain preferred guarantees might earn a low-interest rate. Depositors not wanting to invest would have their deposits given over to the Fed, and that money would be held there, and the need for FDIC insurance would cease to exist. Besides these efficiencies and cost savings, other benefits will be laid out in the rest of this survey. One huge benefit would be that Treasury Bonds, Notes, and Bills would no longer be necessary, as the Fed could create this money. The government and taxpayers can save crucial money by not paying interest on Treasury securities and thereby stay out of debt to private investors. Businesses and other financial institutions are now dependent on Treasury securities to meet various financial requirements in our present world. These markets can wind down, and other mechanisms can be put in place to replace Treasury securities. How would all these adjustments be made? How much money could be safely created to keep the economy safe between inflation and deflation? How could the U.S. citizens be protected from the whims of Congress wanting to create too much money? How should we think about money for employment purposes and getting the needed money around to all the sectors of the economy? For better or worse, the Fed is at a crossroads with choices. The choice to go forward in this direction would give the Fed an educational role, policy choices, and to decide as intelligently and scientifically on the aggregate supply of money. It is the belief of AMI that to monitor all these questions and more, the Fed needs to become a public institution and become the fourth branch of government.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Let's continue looking at the world's challenges, including economic migration. That foreign banks and American banks offshore create eurodollars goes beyond the scope of this paper but remains an area for research and crucial policy development. Alternative proposals like having an international currency along the lines of carbon credits and revisiting the previous policies of parity and parity tariffs are also being considered. The goal is to make seigniorage and regulate a dollar's value work towards justice and equality. What is parity(?) and the parity tariff? Parity was, and is, a U.S. law that was in effect from 1942 until 1953 and is a period worthy of study. These policies might be reformulated to meet today's challenges as they successfully met the challenges of WWII and its aftermath. Parity works on the notion that we are all interdependent in society and that we need to be paid sufficiently to have a healthy life. The parity tariff is simplified here based on the principle laid out by Carl Wilken in 1947 titled *Prosperity Unlimited - The American Way* (out of print presently). Although this goal is beyond the scope of this survey, a microcosm of this perspective is shared here to give an example of the imagination we need to face today's challenges. The idea is similar to Henry Ford paying his workers well enough so they could afford to buy his cars. High domestic prices are necessary for a higher standard of living, especially for the workers who produce those products. Equivalent imported goods coming into these advanced economies at a lower price have an import tariff tax equalizing the import and domestic price. The money collected goes into a bank account. After some time, each country balances the accounts, with the poorer countries receiving the profits that formerly went to the importers. The poorer countries could then spend that balance of money in the country they exported to during that period and pay for the goods at the domestic price level of that advanced country. By doing this, the domestic price level in the more advanced country is maintained. At the same time, this parity tariff program helps the poorer country bring up their standard of living. Here is a simple example of the above. A California producer of avocados sells in the domestic marketplace an avocado for \$0.75. The grower can pay their bills and make a small profit at that price. I live in Chicago and can buy that domestic avocado from my favorite chain store for \$1.00. The importer for that chain store also buys an equivalent avocado from Mexico for \$0.50 and sells that avocado to me in Chicago for \$1.00. The difference between purchasing the California and Mexican avocado is \$0.25. This money would not be profit for the importer or my favorite chain store or savings to me. Instead, it would be hit with a tariff that protected the domestic price in California. After the accounting back and forth was done over time, the tariff money would assuredly show a balance of imported tariff money coming in from Mexico. Mexico could use this balance to buy U.S. goods at U.S. domestic prices. This parity tariff system would be an economical way to bring the world up to our standard of living and reduce the need for economic migration. A lot that goes on in the name of developmental economics becomes a debt trap for poorer countries. Parity economics and the full employment goal of the Fed would help eliminate suffering here and abroad. The responses to the first two questions give our perspective on how a CBDC should come into existence. The goal is to make money neutral and not favor a private elite group of bank owners and officers, but to make a system work that favors all people equally. If the New Fed is making jobs available on-demand, there will be the money available for people to afford their mortgages with little to no need to have a run on the banks. However, making things work well in this country does not eliminate the pressing problems affecting the whole world. Rather than have a currency that dominates the world with unfair privileges, we need to develop parity tariffs and other parity economic ideas to create a supportive and nurturing humanity and not wanton greed and profit. By this time, we should know that the Earth cannot give us compounding interest rates and unlimited growth but hopefully can meet our real needs.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Imagine we had a monetary system where if a person wants to help society, there would be a decent job found for them. There might be less violence and real helpful productivity gains. Is this possible today? If you create money only for actual employment rather than to financially speculate or simply throw money at a problem, the answer is yes. Take the example of Colonial Pennsylvania and the paper monetary system they created there. It says right in the 1723 law that issued the money that this law is "... intended for the benefit of the poor, industrious sort of people of this province, at an easy interest, to relieve them of the present difficulties they labor under...."

(<http://www.palrb.us/statutesatlarge/17001799/1723/0/act/0261.pdf>, p328). It was a paper money system the purpose was to support a medium of exchange for all the productive aspects of the economy. By the late 1720s, young Ben Franklin understood and wrote about the procedure. We credit him for starting the Post Office, Sanitation, Fire Departments, etc. He didn't have the money to do all this, but he knew how the Pennsylvania Assembly could create the money (think Fed and CBDCs) and have it recirculated to put people to work. Despite the French-Indian War in the 1750s, Colonial Pennsylvania ran the least inflationary

monetary system during the colonial period and, by one source (Lester, Richard; Monetary Experiments, 1939, reprinted 1971, p.108) in any 52 years of U.S. history. They focused on work and jobs and not on making certain people privileged rich. If the Pennsylvanian Assembly could do all that with little background in political economy, then the Fed should undoubtedly be able to do it today. Yes, inclusion all the way!

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

We are now aware of climate change, pollution, and the need for humans and life on the planet to harmonize with the Earth itself. This goal should help define where the jobs need to be. The goal is to create money for jobs to meet the pressing needs of society and the planet, not for financial instruments in a secondary market. In a command economy you can create money to employ everyone. Create money in excess of that is inflation. AMI does not want to support a command economy, but does want the people hired who want to help society. Priorities are employment with good benefits and retirement. Simply, if a person wants to work, there is a job available to them. We want this for ourselves, and by extension, our family and neighbors, and outwardly to everyone. The goal for the New Fed is the full availability of jobs without inflation.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Let's consider the difference between commercial banks bringing new credit/money into circulation versus the New Fed bringing new money into circulation. The New Fed can bring money into circulation, not tied to collateral or interest rates. What is the difference? In a debt-based monetary system with profit and growth as the central themes, collateral will tend to replace trust over time. Finding collateral will be the basis for obtaining a loan and wealth creation (Milton Friedman). Michael Milken has spoken about the need to collateralize the commons, i.e., the public sector. He was saying that we are running out of private collateral to maintain growth. In theory, a bank could, over time, own the water rights of Bolivia or own Antarctica. Besides the problem of collateral, there is the problem of interest rates. In a debt-based money system, the loan principal becomes the new money coming into circulation. The interest payments have not been created, and it is paid along with the principal. In stagnant times with few new loans being made, this debt-based money system can still work if the banks, who earn the interest rates, can get that money back out into circulation so the borrowers can earn that money to make the payments on their loans. However, if relatively few people and companies obtain an excessive amount of the money supply, there is less money available for borrowers to earn and make their loan payments. Debt can increase beyond the available income earned to pay off the debt. Human-caused or naturally caused circumstances all too often means that bank loan officers lose confidence in the overall economy cyclically, and debt defaults occur. Here is the monetary reformer and environmentalist's plea to ourselves and the people who lead our monetary system: Interest Rates, Collateral, and 1,000,000 Living Species to Be Lost: Interest rates put the economy on a treadmill in a debt-based monetary system. Everyone in the aggregate has to push to pay the overhanging debt. Together, interest rates and collateral will automatically push humans towards profits and growth over the needs of sustainability, a healthy environment, and in the aggregate, a healthy planet. We are in the midst of losing a million species, one-quarter of the plants, at a rate perhaps only exceeded by giant meteors hitting the Earth in earlier geological times. We live in a system where the earth credits and humans debit. When will we pay back Earth and have a pristine planet again? Our money and banking system today is like the cheerleaders at a sports game, promoting more human debiting. Suppose a newly created CBDC (purposed by Congress) is coming into circulation while the banks are still issuing new money via loans. In that case, the Fed's action may serve as an occasional relief valve to one significant, onerous tendency of our present debt-based monetary system in "side-by-side" money creation. However, the overall challenges will remain in place to undermine our humanity, and perhaps competitively so. Instead of money, profit, and growth leading the way, we need a monetary system that promotes patience, love, caring, curiosity, and understanding so that a pristine Earth can meet our and everyone's actual needs. The time has come, and if not now, when?

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Yes, we can have private, non-profit, or public banking systems that can stand on their own two feet, and if they do well, they can make a living equal to any other sector in the economy. They can provide efficient fee-for-services and investment opportunities. Suppose we have a New Fed and a Congress concerned about jobs for everyone who wants them. Can the Federal government still invest new money into the banking system for mortgages, student loans, and business investments? The New Fed would have to help determine the level of spending and perhaps coach Congress as its investment banker. Maybe instead of direct student loans, Congress could allocate money based on student attendance at higher and

adult education places for jobs at those institutions. Perhaps Congress could give money for new home mortgage loans knowing that money will put people to work. After Alexander the Great died (323BC), one of his generals, Ptolemy, obtained control of greater Egypt. Until the Romans took over in 30 BC, a banking system developed and infused into the government. For example, the government made investments in papyrus paper for writing purposes, which was financially successful. Perhaps the New Fed could support Congress taking an equity position in some adventure and making some profit(?). AMI has no present policy on this, but this writer thought it was an idea worth mentioning (Heichelheim, Fritz M.; *An Ancient Economic History*, Vol. III, 1968, p. 112-125; a marvelous description of this ancient but sophisticated banking system). Stablecoins and local currencies both have merits. Cryptocurrencies are pretty problematic. Questions around seigniorage, energy requirements, and fairness to the broader communities where they operate need to be considered case-by-case. That Silvergate bought the non-profit Diem stablecoin technology makes me curious, and at this time, the answers are not available.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Some financial innovation products such as interest rate swaps and auction-rate bonds can turn the banking world into a casino, and great harm can be done. If the New Fed controlled the money supply with the purpose of funding society's work, these questionable practices could be eliminated. Money Market Mutual Funds came about to meet the practical need to get around the interest rate ceiling in the time of high inflation during the 1970s. If the New Fed can do its job keeping the economy in-between inflation and deflation, the need to go around the existing system can be avoided. People desiring high interest need to secure credit cards or take an equity interest in a start-up company. Suppose banks and financial non-banks are allowed to continue creating the money for society as we have operating today. In that case, the above problems and more will not change. CBDCs will simply come into existence as part of the system that protects relatively a few people maintaining an unfair privilege and its advantages. The Fed needs to work in an enlightened way with all citizens and the legislature to remake itself to meet today's challenges.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

It can be anticipated that cash usage would decline. However, as a medium of exchange, cash would still offer the best privacy and, for many, an essential measure of confidence in the monetary system overall. Next to holding gold and silver is cash for many people worldwide.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

At Chase Bank, Zelle and other products quickly make payments across the country within those networks. In time, with or without CBDC, these products will develop, but much more slowly than the potential of a CBDC internationally connected.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The old saying, "No one likes to change except a wet baby." In the name of efficiency, we move on. What will happen to Western Union and their business? How can they evolve into a new future? The currency exchanges may have other products to keep them going, but they may not wholly survive. The good news is that there will be other good jobs available to help serve society. Being interested, having the ability, and applying oneself will help steer oneself to the desired job, but being open and trying something different but valuable will also benefit society and should be personally rewarding. As far as CBDCs are concerned, one can only imagine that U.S. citizens would not want to be left behind.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

If cash is maintained, and the Fed is ready to look at maintaining full employment seriously, everything else can be made to work out. Because of a pandemic and supply delays, disruptions in the economy can be modeled and forecasted much like we forecast the weather today. In Colonial Pennsylvania, there was £85,000 in circulation before the French-Indian War started in earnest in 1755 after Braddock's Defeat. For approximately five years, that war continued in North America. A dramatic £485,000 was created and put into circulation "for the King's use" to fight that war. Taxes took away nearly £85,000 leaving

£485,782 in circulation by mid-1760. By the early 1760s, there was price inflation, but not the 500+% predicted by the amount of additional money for some reasons. Another factor was that the Pennsylvania Assembly, from 1762 to 1769, taxed out of circulation £25,000, which helped lower prices by 13%. Today, with modeling tools and education, the citizens can learn what is needed to come out of a crisis with inflation. Citizens would know what is happening and could support of their own volition what is required to get to the desired result. This transition to full employment based on worker desire would be a change in mindset. Education would play an important role. Ultimately, the central banks would have to work together with BIS and economists to develop a plan to accommodate the world's population living in harmony on this planet. As a past anthropologist and environmental science teacher, this writer can tell you that there will be no lack of jobs to help maintain harmony with Earth. The good news is that the Earth can be forgiving and patient as we give back the credit that we have debited. Also, some will bring up population control. Instead, I would suggest using the term "population education" and an honest explanation of how the monetary system can support us individually and society overall. People can make good decisions.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

The lack of monetary privacy can bring up a lot of fear. Yes, there should not be illicit financial activities, and today's governing bank money laws can be applied to CBDCs.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

This question goes beyond the policy questions that AMI has considered. Learning from the world of cryptocurrencies and stablecoins such as Diem might be a start.

*14. Should a CBDC be legal tender?*

Yes, it will give citizens more trust and confidence in this form of money.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Naturally, interest might well kick-start the currency and then be dropped later. However, interest should be unnecessary due to natural curiosity and the services that such accounts will be able to offer. Interest should be associated with risk, and there is no risk here.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

No. However, today, there is a problem along these lines in our monetary system. When you have super-wealthy people, they can influence the markets. We might need laws to govern how large amounts of existing money come into the American economy so that the Fed and Congressional policymakers can make adjustments for needed job creation and price stability. For example, suppose a rich person wants to open a plant and hire many workers with decent salaries and benefits. In that case, the Fed and Congressional policymakers might not have to consider creating the money to put these people to work if they need jobs or more work.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

This question brings up fundamental structural issues and the meaning of "intermediaries." The word intermediary in banking and money textbooks starts with a general meaning: "a bank borrows short and lends long." Today, all the way up to the BIS website, you can find "intermediary" used in this most general sense. The AMI uses this term more precisely when a bank or non-bank financial institution uses actual depositors' money and transfers that money to a borrower. The money used in that transfer is not the bank creating credit. It is the depositor(s) investing. Since 1971, when money market mutual funds were created as a move toward financial innovation, the Fed and other central banks have gone on a faster track of losing control over their respective national monetary systems. With cryptocurrencies and the Diem promoting a stablecoin, the Fed and other central banks will continue to lose market share and the corresponding seigniorage privilege. The fundamental question is, to whom does the seigniorage privilege belong? In the United States, the seigniorage privilege belonged to Colonial Pennsylvania with its alternative paper money system. During the American Revolution, the "Continental," despite England successfully counterfeiting it, the seigniorage was gained by the Continental Congress. During the American Civil War and after, the Greenbacks were the seigniorage privilege of the Union government. History shows that if the bankers control the seigniorage privilege, then over time, they will control the financial system and then the government. If there is equality, where money is neutral, then

the seigniorage privilege belongs to the people or its representative government. It certainly does not belong to a private class of citizens called the bank owners and their officers and lobbyists doing their bidding. Is the Fed important? Yes, it is, and it's so essential that there should be a New Fed, and it should be the fourth branch of government, crucial in its realm, and equal in status to the other branches. How can seigniorage equality be achieved? The answer is in many different ways. The Treasury could obtain the full seigniorage privilege, or all the nation's people could gain the seigniorage privilege by having all new money go equally into their Fed Accounts. An intermediate possibility is for cities and states to set up public banks and be allowed the seigniorage privilege of issuing money for work. Or, differently, the cities and states could simply obtain the necessary financial distribution to do their hiring or procurement, or lending. To avoid inflation means you do not allocate money to solve a problem by throwing money at a problem; you create the financial resources when you have the people and the resources to solve the given problem or achieve an opportunity.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

Yes. One idea is that a person could go to their post office or participating financial center working with CBDCs. They could simply swap CBDCs for cash and use it offline.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes, but maybe there should be limits, especially at first, as we go through a learning curve.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

You are working on those capabilities now. Good luck, and we support all the technical success that is possible and feasible.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

One day we might want to separate banking and lending as two separate practices. The first would be a fee for services. The second would be a worldwide peer-to-peer lending platform(s). If you invested a \$1,000, you might have 1/10 of a penny in a million homes - a genuinely diverse and hopefully a stable investment.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

It is certainly a different day. We have population and demographic challenges. We have pollution, climate, and pandemic problems. We have resource problems. We have the problem of a lack of collateral and trust in our present financial system. However, if you are ready to tap into the love people have, you will find that while the Earth itself and the Fed may not meet all the wants and greed, but will be able to work out a plan that amply meets the needs of the people. It will be a society led more by curiosity than the need to win and have more and more. In one way, we are democratizing money with CBDCs. However, in another, we, as a society, are ignorant and have lost our way in how a monetary system works. Slowly and continuously, the Fed, as part of the banking system itself, has protected a plutocracy of its kind that, in the words of my senator, Dick Durbin, "owns this town" - referring to Washington, D.C. I don't think that was the intent of Congress when they passed The Federal Reserve Act. The Dodd-Frank law did make regulatory changes to prevent another Great Recession. But, within a few years of its passing, the bankers' lobby had that law dismantled, and we are at the place as we were prior to that law. Today, we are entering a whole new territory of possibilities while, at the same time, we are patching this monetary system to keep it functioning through today's challenges. However, the inherent structure is driving humanity off a cliff. Citizens look at their circumstances and don't understand them, and many follow untruths and conspiracy thinking. In part, we have a fragile democracy and further potential for political upheavals. This situation reminds me of early ancient Greece, where the citizens would turn to a tyrant and hope for the best. The way out of this is honesty and education and acknowledging we need to work toward democracies on all levels and not a plutocracy. We have to make money neutral again and not give some people an unfair advantage that recent history has shown that they will use to privilege themselves at the expense of others. The Fed reminds me of the wizard behind the curtain in the Wizard of Oz. The Fed needs to come out from behind the curtain, be with all the people, and work for all the people. Thank You for this opportunity!

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Propel builds modern, respectful, effective technology that helps low-income Americans improve their financial health. Our flagship product is the Providers App, used by more than 5 million families for banking and management of their EBT benefits. Over 1 million of our users currently receive Disability benefits (SSI/SSDI). Over 1 million use the Women, Infants, Children program as well. All told, some 40 million American families live with low income, and 20 million will use government benefits delivered on an EBT card each year. We recommend the Federal Reserve to explicitly conduct research into how a CBDC will create risks, benefits and opportunities for the 1/3 of American households that are most frequently unbanked and underbanked, most distrustful of financial institutions, and most likely to be significantly impacted by changes to the fiscal operations of the Federal Government. For these families, we've found that every dollar really does count. A single dollar represents a basis point or more of their net worth. Every day counts too. Receiving a Disability deposit a few days early can dramatically reduce the risk of incurring fees, penalties or hard choices that impact their health and nutrition. The potential benefits of a CBDC for this section of American society is tremendous -- potentially resolving small dollar liquidity issues, reducing the incidence of fees relating to low balances, and reducing demand for expensive short-term debt. However, the impacts of a CBDC on the operation of the social safety net is far from clear. A programmable digital currency, if the use of those dollars could be restricted to certain goods and services, raises questions about the future of the EBT processing network, and the delivery mechanisms for both the SNAP program and the WIC program -- programs that are actively lifting millions of children and their providers out of poverty. In addition to conducting research with these American families, we recommend that the Federal Reserve seek input from stakeholders at USDA, HHS, the Treasury Department, and state human services agencies about the pain points in these systems a CBDC might help address, and the risks it may create.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial*

sector? Would some of these tools diminish the potential benefits of a CBDC?

8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?

9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?

10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?

11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?

12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?

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14. Should a CBDC be legal tender?

15. Should a CBDC pay interest? If so, why and how? If not, why not?

16. Should the amount of CBDC held by a single end-user be subject to quantity limits?

17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?

18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?

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Other: Artist

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*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Freelance Artists and content creators are already over-exploited and many remain outside of a traditional, current marketplace without a: median, mean or mode to statistically quantify they even exist. The Blockchain, Crypto, NFT system further exiles these millions of already marginalized. American Artists and their art forms are being relegated to and racketeered by; the Crypto market through a portal of lies built-on sham ideals and misrepresentations. The underlying fundamentals of this process are based in fraud. Further the sham ideals put forth in this marketplace are not accessible to populations of females in America, in any meaningful or productive fashion. Artist's will be unable to make their contributions to social cultures available and culturally relevant because the market space will be controlled by a new monopoly in the Art space. The Art space will be forced, without any other options into a monopoly by an economic need to conform. Blockchain using Crypto is taking control of Artis traditional assets in ways they can't control or have any-say about, as American citizens. Art funneled into Crypto NFTS is simply for the soul-sucking purpose of crafting fees and digging channels that surround the art marketplace with toll booths. The NFT marketplace essentially carves Artists and their social functional relevance out of the dea. The Art marketplace is overrun by this "alternate" market that arrived with an outsized presence, not via organic offshoots or actual human production-growth of artists, for Art but via hucksters trying harness access to excess in a hyper-male only, extension of global VC markets. People now in this space are not life long advocates of Art for Artists sake but form a world of shifty finance and back door money laundry programs. Block-chain's claim to market changes as innovative for people like Artists is entirely false. The outer shell of marketing PR may be wearing a wrapper of social good but they are anything but, social or good. Artists don't need a clunky blockchain/Crypto/NFT method that is not accessible, expensive, volatile and unsustainable. I our US government wants to go all-in for Artists as an excuse to create a functioning, fully VC funded marketplace: they can create an artist collective, a coo-op and a government works project to promote programs. There are models of systems that do work and provide teaching tools for preservation and conservation of our one shared, Earth. I've studied the market and read what is happening in this space for the decade or so it's been pushing it's way into our financial system. Blockchain is a fantasy that in real-practice is nothing it's mysterious and nefarious creators claim it to be. It's a novelty by product of greed for the status quo. It's a market that is capitalized for gamblers based on speculative fiction without assets or values.

Even if this forced extension (called an NFT, a non-fungible token) which sits well outside the reach of real market forces, day-to-day needs and process by real digital artists; it's still essentially a grab by Crypto Players to exert more FMO (fear of missing out) using old fashioned pump and dump schemes to the marketplace. There is not a single artist anywhere in the world who woke-up one day and said: what we need is a funky, clunky, inaccessible, blockchain that capitalizes on the destruction of our the ONE Earth while exploiting us for their own motives and agendas. Currently the entire Blockchain, Crypto sinkhole is a drain on Artists who want to get busy with authentic innovations and creative world solutions for everyday concerns. But funds flow to this outer market rim, called Blockchain and Crypto. To expect Artists to join and compete and participate in a worthless marketplace of hype and volatility that serves only the shadows that prop it up. There is no positive outcomes for art or Artists here or Tax payers who would be funding a process that still carves out everyone but the richest males and dumbest gullible people who are their mark. Blockchain fantasy market claims tell one story while in truth and practice the system operates differently and exclusively for pump and dump Ponzi schemes with short shelf-life cycles and happen in direct contrast

to actual factual, data. This marketplace is overrun and riven by males who see themselves as evangelists above others and their lies as a means to their nouveau riche and any method they choose to maintain it. As a digital artist and media maker the truth is that the Arts and Artists don't need Blockchain based Crypto NFT's putting a choke hold on their on assets and resources. It's not a fair game plan or sustainable method to preserve a legacy of Arts and Artists in the digital realm. There are better ways but its a closed system so no ones asking or looking.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Yes. A digital tag can be generated that has multi-functions and practical, affordable uses well beyond the blockchain method in instances where a digitized frame work is needed to: present financial assets, timelines, contracts, ownership, transactions etc. Its flexible adaptable and correctable. Additionally this method I purpose can be used to create digital assets in a functioning market much like a new type of bond offer. For the purpose of establishing values for something constructive and tangible or non tangible services that are useful. It will be a digital token an American could exchange that would give the current market price value when used at a checkout by reading a balance on the asset after it sold. Similar but more flexible than Treasury bonds. Money spent to purchase them would and could be used to finance causes to benefit social needs and consumer. This method can be used to integrate and expand the world of finance to all Americans. This Digital Token would not need to operate on a block chain but rather like being issued a code on a new bill. Us assets for treasury all have serialized codes and a similar system can be used to create digital tokens for Americans. But it does not need a blockchain. There is another more straight forward, way to accomplish this objective for a digital currency that is more flexible, more secure, more efficient, more accessible and non-harmful to the Eco system of our One Earth's, continued human habitability. It will make the nefarious fantasy island of the chunky blockchain system that depletes the Earth, obsolete because its a burden not a solution. As a digital Artist I can create this today and it's an extremely secure method. Its a way to make tokens transferable, accessible, usable and with an equal share of values. The new mode of currency can even be used to promote and educate consumers as a form of savings, as a market method to expand access and equability of all Americans at every level of need or desire to participate in the financial markets. Americans already have to participate with 401K's and in other forms that are not direct modes. The market requires certain things and the assets have lots of rules and other conditions. A new asset class in digital tokens could be created so that Americans can invest in themselves, their lives, their neighborhoods, their educations and a multitude of other things for infrastructure and progressive climate changes needed. But if they need to liquidate it it can be made whole at whatever current value that code, holds. They can be valued on the market prices of a secured token and then burned, or used by giving-up a measure of value for short term gain (needs) and potentially profiting, based on the length of time the token is held. The use of that digitized asset will automatically be known by the government for good record keeping of losses, gains and purchases of the digital assets. It can all be built in to the assets as it is formally created. Each can be tagged and created at the purchase point for the consumer. So a person, or a group can have a stash of (these proposed) new digital tokens they use to buy an investment in social themes they choose: selecting to support the environment, selecting to support infrastructure, selecting to support helping with America burdens by poverty and to build places for the homeless to be treated like people with dignity and a home. Or if the person who buys the asset suddenly needs access the value to say buy gas because they are out of a job or something... the digital asset they hold can be exchanged for use at the current market value at the time it is used. That value then goes away. It was burned or used. The asset won't accumulate anymore value. But as long as the asset is unused it will grow based on its age and its current market value. The process I'm purposing is based on rendering assets so each asset is its own store backed as a government asset class with parameters as I have laid out. They can be gifted, transferred, held, stored, expended and each has its own inherent value to the whole. It doesn't rely on any of the current systems that are not sustainable. An analogy: think of it as a clam with a grain of sand that is creating a pearl. The seashell is the render of the asset, a digital shell that reveals what kind of token, make and model it is. The render is the method to generate each secure tag. The grain of sand is the value spent deposited inside the rendered, digital shell. The asset grows based on the agitation of market factors of real values. The longer the sand is creating a pearl inside the clam shell it retains a steady value and potentially increasing (some more, some less) based on the type of token purchased. As long as the clam is sealed that pearl stays and grows. And when you crack it open its value is static and its asset use is recorded. DART: digital asset rendered token

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Blockchain will never be inclusive and it's expressive outgrowth into the market is always going to be limited and predicated on defaults. It is what it is and this idea that over time it will become something else is ludicrous. I'm calling my idea for a digital token a DART as just a working title. for a digital asset backed by our government and used as a store of value) because DART(s) can be used to target purchases as assets in unlimited categories that can promote future education, recreation, home purchasing and starting or buying and existing business or just to save. My idea for digital assets can be built as a fully functioning asset that can be easily integrated into current financial Eco-systems and if they existed now they could be purchased to help Americans help stabilize economy to reduce inflation. The way they are created (which I can explain if you'd like to know how) makes them 100% accessible to any American. A DART targets a bridge between investing, saving, spending, supporting and growing our Nation as an advantage to raise all ships. For all Americans to be supported by an equitable method of digital coins and tokens. But at it's most basic level a person can be self sufficient to collect, store, trade and/or use the at will. This digital store will survive a flood or fire and won't put any strain on the electric grids or drain any resources.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Oh that's an easy one. Block chain Crypto markets in real time are parasites who feed off the frenzy in the market and want volatility to make them look attractive and potentially useful. They are not. A digital asset rendered token rendered is exactly the opposite. Funds spent to buy them go straight into a government fund that forms pools of funds for a reasoned outcome or value. A processes as a store of value issued by our government could come in a diverse variety of flavors. Americans would be investing in both themselves for asset store and growth and a their chosen desire. Maybe they want to build an education pool so they buy tokens for education to be supported by progressive programs., This can fund anything targeted at real time needs. Let's say we want to bring down inflation? Americans can buy gas tokens that allow Americans to own and operate the gas stations and even the industry. Americans can choose to invest their tokens into the things they need as a store of value for future growth or needed personal liquidity. Inflation would go down because this self sufficient mode would allow for very targeted needs in the time and place they exist. Using them and investing in them can in short period of time give Americans a wider sense of control over market forces as their own shareholders of the store of value. By choice. Americans who currently invest in the fossil fuel industry have little of no impact on its behaviors. But collective buying powers can change that. Self sufficiency in Americans wallets can reduce the need to buy into a fierce market and reduce consumption that is causing wealth deterioration while enriching a few. This would allow for a flexible, adaptable, alternative that has power to shift trends for social good that is easy and cost effective to integrate into the current financial system. I still want you to use the clam and pearl analogy but you could also think of it as each token style and trend can be a collectible, collective. The funds of the government in digital coins would act somewhat like a co-op. Each set or series can have a unique appeal like postage stamps. And in some cases then a person (group, company, corp or non profit) can in certain asset categories create their own style or series of digital assets to sell their brand and create their own legacy assets. Based on my method described above the asset would also: always be discernible for taxes purposes and even if whoever holds the asset goes bankrupt the asset purpose, values and holders are all easy for the court to know and understand. There are no shadows in the back room.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

The Blockchain and Crypto will always be negative because the system itself is static. It is said to be unalterable and that's not a good thing because with money, it's like water. It needs to move and circulate and flow. Crypto holds it in a choke hold. My DART asset would flow and grow the economy because it means Americans can buy their choices in the market to grow what assets they need to supplement what they have or start when they have nothing. The only loss for a DART would happen if the Government as we know ceased to exist.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

Absolutely. The current market players in the top of the current global markets want absolute control and every digital asset will have some way for them to earn transaction fees or other perks that drain off the values the asset holder should get direct form the investment through a co-op of other Americans in our treasury system. control how this happens so they can control the asset. Otherwise the market movers now will try to control it for their own greed and gains.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Well the more you have a core group of private interests; let's say right now the world of pension funds, i.e., Fidelity are chomping at the bit to get Crypto into their clients portfolios. Because then that forces tax payers to fund the always failing always flaying lies of the Crypto Market. It takes away the Tax Payers choice to fund these programs with Crypto because of matched funds. It creates an financial eco system where Americans are forced to pay fees and manage volatility where they just want security. So it's another scheme to pump up these failed market tokens by creating tolls along the way that hack away at the funds Americans worked for and want to save for retirement or some other purpose. The funds are no easily accessible and if they were it would be at exorbitant costs. The hype needed to market them is also not practical or ethical.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes. But not as Crypto. Not on a Blockchain.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

They will be exploited and people will be pirated.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

Not at all. The United States should not be pushing the cart for Blockchain or Crypto. The united states has a chance to crate a new marketplace that can be accessible, equitable and a good store of value when backed by deposits used to purchase tokens but expanded to have a vested component, a choice in their uses of each tokens funds and even to fund their own businesses so it can bridge a big opportunity and we should be the forerunners not the followers chained to a bunch of greed mongers who use fantasy over value and speculation over truth. The current block Crypto market tells us one very important key fact: Americans and other people want a portable, digital currency, they want PDC's and if we are conscious of what we are doing we can create a store of value system that will be the model, unchained.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Develop a new system that functions on all the points that make it accessible, portable, store-able, usable and invest-able. And nowhere near the Blockchain and Crypto. Let that system fail. We can do way better, more practical, infinitely more useful and highly adaptable.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

I've already answered this in my version of a portable digital asset given above. So I can say that Crypto will always be a pirates booty. Blockchain is designed that way. A different style of portable digital asset can have profound effects on reducing illicit financing because all the assets issued will have a serialization coded to each one as a tag rendered for it as it is issued. A DART is a digital token (coin) that is monetized, when its monetized (someone buy it) it then is rendered with a tag of its own: that can be stored, used, transferred, traded, sold, or burned-for-use. It's traceable, track-able, stack-able, collectible and the code is the key is only known by the issuer, treasury and the holder. In my idea the tokens themselves are decentralized in that the cooperatives that issue them do so through a system where they go through the government much like we make stamps for the post office or commemorative coins for collectors. It's a kinda-similar theme. So it's much harder for anyone to hack a whole bunch of individualistically, discreet tokens and that reduces the external forces that can pilfer funds in assets classes. DART: Digital Asset Render Token is a clam with it's own grain of sand that can over time become a pearl. Its a store of the asset indie its own shell and cracking that shell won't spill all the others. Ask me more if you'd like me to share this digital method is done.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

It can be used to provide a safe secure store of value that is portable and allows whoever

buys it to vest their assets as they choose, for the purposes and support they are seeking.

The type of asset style I'm purposing would have very little exposure as a holistic system because the digital assets are discreet to the person(s), group, company, corporation or cause that issues the series. Each discreet token purchased becomes a building block that holds and flexes with market needs yet retains a steady value and potential for growth.

Operationally the government would simply need to keep their store front (the US Treasury) free of criminal hacking. Individually if a person lost their wallet or when/if it is stolen they can report it and the anti-theft process built in can burn the stolen asset leaving it worthless and reissue an asset to replace any lost or stolen token. That's about the worst case scenario based on my method of rendering tagged coins or digital assets. It would not be a creation of a behemoth that like banks can fail and Crypto can thwart and drain the system in a exclusive model. My DART model uses a claim shell. So once the shell is cracked the system knows and if a large scale crack happened it would know and isolate it. How could that happen? An example would be a corporation that holds a sizable amount of the digital tokens as stores of branded assets might have a reason to sell them all at once. The government issued overnight liquidity for private investors for several years running as a run up to our current Crypto and inflation crush. In this example of a big burn of a corporate entity it would not be of any harm for the government to issue itself the needed liquidity for such a load because it's stores are safe and it's main holdings in digitized assets are diversified in the public marketplace for the people who use them. So the DART system is centrally secure, portable and its uses are entirely discreet because they are truly decentralized and dispersed versus a decentralized, and unmanageable Block Crypto system that does not allow, discreet use but requires a complex interfaces and unstable carriers by contrast.

#### *14. Should a CBDC be legal tender?*

No for Blockchain or Crypto. But for DART, yes it could be a class of tender with asset value rules based on it's purchase value, purpose, collection, storage, investment growth and use.

#### *15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Again there are two options here one is that no, Blockchain and Crypto are not sustainable or usable or functional. They do not work for anyone except those who pump and dump based on fear and hype. The dangerous nature of Crypto mining is a risk too far. But a different type of digital asset can be made to acquire value so that can be considered interest like savings or T-Bills. CD's and monetary vehicles most similar to what we already use but as a hybrid of new forms for vesting in tokens for a wide use of reasons and choices.

#### *16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

That depends on what the model for a digital asset is.

#### *17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

You are making this way to hard. It can be a branch of the US Treasury and think upon it as a person buying a forever stamp. It will always be face value backed by the government.

Whenever its used that value is 100% and those purchase limits can be similar to bank insurance and likely sufficient if our government wants to insure a branch of itself. Issuers of the currency can only be our government but the form a token can be is very flexible as a asset vehicle. You can offer other models based on what the consumer wants to create and buy or consumers can select from choices that the government offers. There is a wide variety of diversity and flexibility depending on how you design this. So instead of buying a forever value type for short term asset value storage a person can buy a token that is invested in government assets like green infrastructure and if they hold it it can grow like a pearl and be based on market values when used. You can have both. With Blockchain and Crypto it's not flexible it relies on checkpoints, toll booths and hidden costs and nefarious Crypto mining that is designed to pay less over time while creating a market scarcity to drive the FOMO. As those choke hold values unravel into the market we see values evaporate except for those who take the asset and run before the air is gone.

#### *18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

It can be designed that way but it is a digital currency and so it should have its basis mainly in that format.

#### *19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Using a different model of Digital currency. Not Blockchain or Crypto. A "Digitally Acquired Rendered Asset" Model is what I call a DARMA. Above I used the working title of a DART to explain how this can be done by issuing something similar to a stamp. A DART stands for: Digital Asset Rendered Token. So I set that to discuss the tokens. But the system is a DARMA model. Considering the concept of a DARMA: It's purchased, it's coded when rendered and tagged for its owner. As an asset that goes based on what the purchaser decides: it can go straight into the vault for long term storage and growth or it can be sold as a forever token to be used for a specific value purchased and sent to a wallet. So based on what the purchaser wants once the asset is rendered (coded and tagged) it goes into an investment vault or wallet. Example: Let's say my daughter is in college and she needs funds for a program that has to be paid that's over the budget we had thought. I can buy some forever DARMA and send it to her wallet. She then accepts it and it has a constant use value like a bank balance. Let's say she's going to school and isn't there yet for another few years. Her mom buys a token for \$25 every-time she gets paid so it can accumulate in the vault and when she removes it, it could have stored values to offset education costs. So one model can have many flexible applications. No one owns DARMA/ or DART because they are public utility assets. They belong to American tax payers as its their government treasury. That means it's going to be a big driver and market player as an asset class for taxpayers to own and operate which can fund social goods. But not as a VC model that exploits consumers through another monopoly or or so-called, decentralized group of unknown shadowy figures which play hack and run. The vault offers long term storage for investment gains based on the category a purchaser wants to buy and can be assessed to remove the asset to make it "spendable" by paying a fee to convert it to a forever value. Even if it hasn't fully matured and the purchaser can have emergency access to their own private liquidity even before it matures. Or let it grow and hold the asset and only borrow to use equity which is returned before an asset is converted or deducted if its needed and debt is still on the asset. A type of margin. These kind of digital assets can have certain age limits and modes to guide values.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Again I stress I'm not considering Blockchain or Crypto viable for this but the DARMA: digital asset render model (the type of asset purchased) can be a DART. Digital Asset Rendered Token (or target) and then be vaulted (stored) or valued with a stamp for use that is a static value like a bank account balance. So that is pretty adaptable to systems we have because a wallet chip can open a card of digital assets and inside those forever values will be constant at anytime. So pretty much its going to adapt into existing systems.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

That sounds like a political question? I guess it depends on whether these assets come out for an accessible source of value for all Americans or just sets a standard where the entry barriers are too gross (not truly functional) to make it useful for most. If the currency is made to be cooperative for all Americans to use and enjoy to build and grow to manage emergencies and what all then innovations will evolve in its new culture to make the framework more resilient and expandable.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

Yes. the design principles that should be considered is to develop a new model and not anything based on block chain or its offshoots. This a farce and its has limited applications. Its being set up as an ongoing pump and dump PONZI scheme that is based on Hype and FOMO. Ad agencies are like other tech industries in that they can be morally bankrupt. Mega institutional Fintech systems only have one mindset and that's to grow profits for themselves and milk their customers dry. In trying to achieve equitable and accessible digital currencies with multiple modalities the benefits can lift Americans out of poverty on their own footing and build confidence in their economic system to be working for them; not just for stock markets CEO's, fill-in-the-blank-childish names wealthy Billionaires give to themselves, stakeholders and share profits. The wealth class only knows who to do for themselves and not America as a cooperative financial system so keep in mind your biggest challenge will be to keep the system a fair, open, model for the good of all not just to profit a few. The systems I express here have great potential for financial banks and institutions to use them to build their profit margins too but on an equal footing. They will have more to contribute to invest but the system won't just favor huge financial behemoths like Black Rock or whoever is given a monopoly. It should fundamentally be designed to work as an true asset class and system for Americans functionally, ethically and environmentally so that its not just another method of

exploitation. I'd like to say my comments here are purely in a first draft form. The ideas and responses are not edited for clarity. There may be typos or errors in the dialogue that should not diminish the ideals set forth. It's just a first draft. Overlook the typos. Thanks.

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*Name or Organization*

Americans for Financial Reform Education Fund and Demand Progress Education Fund

*Industry*

Consumer Interest Group

*Country*

United States of America

*State*

District of Columbia

*Email*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The Fed white paper assumes that a central bank digital currency, issued by the Federal Reserve and promulgated using distributed ledger technology (DLT, e.g., a blockchain), would be the primary and/or preferred means by which a federally issued or 'public' digital currency might be issued. This paper also assumes that such technology and its associated institutional architecture may be able to address key financial inclusion issues, such as lack of access to bank accounts, the need for faster, more secure and reliable payment systems, etc., and can do so while offering sufficient privacy and consumer protections for CBDC holders and users. For reasons related to efficiency, privacy concerns, consumer protections, and financial inclusion, we urge the Fed to reconsider this fundamental premise and work with other financial regulators to make room for a more polycentric institutional and technological architecture, which may or may not incorporate blockchain-based tokens, if they prove to be as or more effective than other option and do not present comparatively higher risks. Indeed, that structure could incorporate both existing Fed systems and new innovative approaches that are not dependent on DLT technology. For example, we would support the acceleration of the FedNow program, with consumer fraud protections incorporated, which would expand the availability of real-time payments as a first step. We would additionally see promise in the deployment of a privacy-protecting FedAccounts system that would expand the capacity of the Fed to provide account-based deposit and payment systems, with low or no fee services, beyond commercial banking institutions to retail customers. Such a system could be coupled with proposals to implement a postal banking program where the post office, which already provides payments-based services such as money orders, could serve as a front-end point of contact for retail users. Finally, we support proposals to create "e-cash" – offline, hardware-based digital cash, built using existing technology, and issued by the Fed, Treasury or some combination of agencies – that could serve the same function as physical cash, without the risks to privacy, consumer fraud and structural imbalances that a Fed-issued, blockchain based digital currency may present. Indeed, such systems already exist outside the US, where payment systems using SIM-card based hardware tied to mobile phone platforms are a popular means of making payments. Card and chip-based hardware already in use for commercial smartcards and U.S. military payments technology could be modified or altered to serve as digital cash, and there are many measures that could be employed to ensure the safety, security and authenticity of such digital cash using existing or modified technology to make such e-cash comparable to paper cash by these measures. There is precedent for such a diversified approach to providing different forms of money via varied technology or systems. Currently, account-based systems of money and token-based systems of money (e.g., cash) already coexist, are distributed in tandem, and converted from one system to the other effectively, with known and understood points of friction. This is also true for other public service systems that not only deal with cash, but have unique payment systems for that service - such as transit systems that allow customers to pay fares using both store valued 'cash' cards, as well as account-linked cards, to serve diverse needs of its users (e.g., short-term riders vs. long-term commuters). The same can and should be true for digital currencies and payment systems. Additionally, while the Federal Reserve plays a key role in managing monetary policy both historically and currently, the Fed is not the only federal agency with the capacity, expertise, and mandate to offer payment system services and issue currency. The Mint, the Bureau of Engraving and Printing, Treasury and the Postal Service have all played this role or continue to do so. Indeed, situating a US digital currency outside of the Fed may help address concerns regarding credit allocation, run risk, and other

structural issues that could arise with having the Fed become the issuer of a US digital currency. It might also distribute responsibility for monetary policy more evenly between the Treasury and the Federal Reserve, such that the Fed would have comparatively more capacity to focus on oversight of the banking system. By expanding the scope of options beyond solely blockchain-based currency vehicles and payment approaches issued by the Federal Reserve (with the risks and limitations such an approach is likely to bring) the Administration would be better able to ensure individuals, commercial entities and other parties have access to a diverse array of publicly issued digital financial instruments and tools, each offering unique properties with respect to efficacy, reliability, speed, security, and privacy.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

The Fed could accelerate implementation of FedNow - with measures to protect Fed Now users against real-time payments or 'inducement' fraud - thereby increasing the speed of the current payments system in ways that could directly benefit consumers – particularly low-income consumers who are more likely to be negatively impacted by slow rates of payment processing. Fed Now not only has the potential to increase real-time payments, but, if deployed using the ISO 20022 standard, could increase the utility of the system to contain more information, and offer options for more sophisticated payment activities (such as encoding invoices within a payment), without the need for DLT-based system. The Fed could also pursue a "Fed Accounts" program that extends the account-based money services it provides to commercial banks to retail consumers. Such an accounts-system – which will need to balance AML compliance with robust privacy protections for consumers – need not rely on a CBDC as the 'fuel' for such transactions but could use the current form of money issued by the Federal Reserve. Doing so would avoid a costly and time-consuming effort to generate a new form of digital, DLT-dependent currency that could meet robust privacy and security standards. Critically, the Fed should seriously consider how the roll-out of this program could address longstanding distrust of both government and financial institutions. One way we believe this could be accomplished is by renewing the Postal Service's capacity to provide low or no-cost banking services as well as other financial services, including access to and management of Fed Accounts. The Postal Service played this role in the past, until such activities were largely phased out or scaled back in the 1970s. The Postal Service is a familiar, accessible agency for many that operates as a public service for all, regardless of wealth or income levels. The service is not without its challenges and has faced malign political interference from various angles in recent years. However, the Postal Service's role in providing vital services during the pandemic despite these challenges showcases how the agency can offer essential infrastructure in times of crisis. Additionally, the recent passage of the bipartisan Postal Service Reform Act of 2022 will provide much needed funding and financial stability for the service, which could set the stage for further expansion of postal banking services to facilitate Fed Accounts. A form of public banking service relying on FedAccounts and a lead agency could also coordinate or partner with similar public banking proposals being considered or developed at the state level, such as in California. Doing so could provide a broader array of accessible, low or no cost financial services to underserved populations while leveraging both the state/national banking infrastructure and oversight mechanisms. Finally, as described above, other agencies could produce a non-blockchain, non-ledger, truly peer-to-peer form of digital fiat currency, that would replace the functionality of physical cash as it is currently used, ensuring that individuals and communities unlikely to fully embrace or be integrated into account-based systems (public or private) still have a method of payment that is secure, reliable, private, easy to use and is backed by the government. It is worth noting that these services could work not only on their own, but in tandem to provide some of the services that CBDCs are intended to provide. For example, future proposals to directly deposit or issue government assistance in the form of tax credits or direct payments could be distributed either by Fed Accounts, e-cash, or combination of the two, with the postal service playing an intermediary role where needed. Outside of these public innovations, the Fed could require commercial banks to offer Bank On accounts, which have low or no monthly fees, as a condition of receiving Fed masters accounts. Additionally, the Fed and other financial regulatory agencies could make sure existing remittance rules and infrastructure are adapted to streamline payments hurdles, and address hidden costs, without the use of CBDC as a payment infrastructure. And, beyond the Fed's remit, the CFPB could adopt rules to prevent the abuse of overdraft and insufficient funds fees, which have significant negative impacts on low-income banking consumers. Lastly, while somewhat beyond the scope of this paper, we would strongly urge the Fed to resist arguments that privately created and circulated cryptocurrencies are a viable alternative to a CBDC. Digital assets have flaws and vulnerabilities too numerous to name in full, but the concerns we and many others have about these assets' security, reliability, volatility, stability and viability as payment systems should be enough to move the Fed to keep digital assets largely 'off the table' as a realistic solution for financial inclusion.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Regarding potential negative effects, a CBDC (in general, or a poorly designed/deployed one) might: 1) Expose users to undue violations of privacy; 2) Undermine access to and availability of physical cash; 3) Push the Fed to take more of a role in the economy and financial markets than may be wise, either by buying more assets to offset CBDC liabilities, or by exercising more control over bank's debt and credit decisions, constraining banks' and consumers' access to credit; 4) Impact funding or support for the community reinvestment act program, negatively impacting access to banking services for low income communities; and 5) Be used or abused to unfairly restrict people's use of public benefits, or to garnish wages to serve private or government debts. Regarding positive effects, it's difficult to determine how to enumerate the potential positives without a clearer understanding of and more detail regarding which CBDC approach the Fed intends to put forth. However, as a starting point, a CBDC would need to demonstrate some of the following attributes (as well as others to be determined) in order for it to be adequately equipped to address financial inclusion challenges properly. First, a CBDC would need to establish principles, systems and standards of trust. For example, CBDC users would need to have confidence in the safety of the credit being used and issued via a CBDC. Users would also need to have confidence that the CBDC issuer would minimize the generation, collection and retention of data produced by the use or holding of a CBDC. Users would also need confidence that the issuer, related government agencies or infrastructure would be treated as a public utility under 'common carrier' standards - meaning all users would have equal access and use of the CBDC and would not be subject to tiered access based on cost or other criteria. Similarly, users would need to have assurances that a CBDC would not be used as a means of political censorship. Second, a CBDC would need to be well-designed from a user interface (UI) and user experience (UX) perspective. Prospective users already have experience using digital tools and apps that are designed with UI and UX in mind. The best of these apps are clear and easy to use, reliable, accessible for different users, and enjoyable to use. A CBDC should strive to meet this same standard, both to provide its users with a similar level of service as private sector tools, and also to ensure uptake and mainstream use of a CBDC. Finally, a well-implemented CBDC should be widely accessible and interoperable. Anywhere a consumer might be able to use a private payment system (e.g., credit cards such as Visa, Mastercard; payment apps such as Venmo or Paypal), CBDC users should be able to use a CBDC with comparable levels of ease. This has implications for both how the CBDC would be issued to users as well as how vendors would need to be engaged to ensure this standard is met. Doing so would not only address equitable access concerns, but would also ensure CBDC use becomes mainstream, a critical measure of viability for a CBDC. While these measures might help, as expressed elsewhere in these comments, alternative measures could also promote inclusion and avoid or more easily address some of the challenges to doing so than a digital currency based on distributed ledger technology, and we're concerned that a CBDC using an intermediated model would more likely fail to achieve the assumed financial inclusion goals from the start.

Lastly, a CBDC might also run afoul of problems with digital inclusion; many people still do not have widespread access to reliable, affordable high-speed internet. Surveys indicate this digital divide persists across racial, class and ethnic lines today. For example, a 2021 Pew Research Survey found that while eight-in-ten white adults report having a broadband connection at home, smaller shares of Black and Hispanic adults reported the same – 71% and 65% respectively. Meanwhile, adults living in low-income households (making less than \$30,000 a year) report having significantly less access to smartphones, desktop or laptop computers, tablets, or home broadband than more affluent households. Low income broadband users also report more trouble paying for their high-speed internet service, in particular during the height of the COVID-19 pandemic. This lack of access to internet service and computing technology could mean that low-income, African-American or Hispanic households would have less reliable or affordable access to digital currencies or payment systems, relative to more affluent, white households. While calls for expanding broadband access have been long standing, there is no clear path for extending universal coverage that we are aware of. Hence, relying primarily on a digital currency that is distributed online and on-chain under current digital access conditions could perpetuate or exacerbate efforts to increase financial inclusion.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial*

*sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

If and as the use of physical cash declines, it is important that people have access to a form of digital fiat currency that can be widely used for payments which provides the same features of physical cash – in particular, the ability to conduct transactions ‘offline’ with a reasonable expectation of privacy, no transaction costs, no need to have access to special purpose equipment, and reduced chance of public authorities unduly ‘censoring’ individuals by constricting their financial activity. Physical cash has been in existence and has coexisted with the use of ledger-based accounting systems for thousands of years. Even today, the use of physical cash is a necessity for tens of millions of individuals in the US and abroad, many of whom are unbanked or underbanked, and use cash to conduct financial transactions, purchase goods or services, or engage in peer-to-peer exchanges of value in a low or no cost manner, with some reasonable expectation of privacy. Account-based money uses ledger systems that record payments which represent contractual obligations between the account holder and account manager to be settled on demand. This system has attributes that, properly administered, can provide benefits to account holders, including fraud prevention and consumer protection. However, relying on account-based money also involves trade-offs. An individual's account deposits can be exposed to risk should the firm holding those funds become insolvent. Additionally, accounts held with financial institutions are subject to AML/KYC monitoring and compliance, which necessarily reduces an account holder's expectation of privacy, even in situations where a ledger records transaction or other identifying information, without an account manager involved. As such, some people may have legitimate reasons for wanting to use a means of transaction that is less dependent on financial intermediaries, ensures some measure of privacy and allows people to take direct custody of the assets they own. Physical cash, or token-based forms of money, differs from account-based money in that such tokens are transferable bearer instruments. The legal ownership of such tokens resides with the person who currently possesses them - either as a stack of physical cash under a bed, in someone's wallet, or existing in digital form on a server or in a piece of offline hardware. This distinction means an individual does not need to rely on a third party to claim this asset, nor make reference to a historically continuous ledger of ownership transfer. They don't receive the protections that account-based money might provide, but neither do they incur the potential liabilities involved. Additionally, two individuals can use token-based cash to transact in goods or services without a financial intermediary, and without generating a default record of the transaction that persists beyond the two parties involved. Reliance on physical cash is not merely an adherence to more ‘traditional’ means of payment but is rooted in long-standing economic inequities and institutional racism which have fostered distrust of commercial banking institutions and related government entities. Unbanked individuals often lack the income, identification documents or credit worthiness that private financial institutions often require for even basic checking or savings accounts. There is also a long history of exploitation of marginalized populations by private financial institutions. This has come in many forms - discriminatory lending policies; exclusion from traditional financial advisory services; predation by firms offering sub-par alternatives, such as payday lending, and more. Finally, low-income, and marginalized communities have experienced decades of unequal and unfair surveillance, harassment, and policing by law enforcement agencies. Finance itself has been used to facilitate such discriminatory policing via practices such as civil or criminal asset forfeiture, bail requirements and other exorbitant fees and punitive measures levied by the criminal justice system. These practices have fostered within these communities and individuals a deep distrust of both private financial institutions as well as government efforts to extend the financial services franchise to them unless or until profound measures are taken to restore trust, reduce barriers to access, and protect individuals' privacy. Thus, access to physical cash and cash-based transactions without use of intermediaries is already highly desired by many and perceived by some to be a necessity. Furthermore, should more aspects of the financial services sector become digitized and subject to either private or government surveillance without transformational changes in privacy law, that need or demand may grow.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the*

*decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

A DLT-based government issued digital currency presents a conundrum for anyone who holds the following positions: 1) Illicit finance is a critical global problem that harms untold numbers of people and must be addressed by regulators, law enforcement, and governments using a range of effective and fair tools; 2) The suite of laws and regulations that constitute the US AML/CFT regime has serious flaws and has been misused or abused by law enforcement and national security authorities in ways that have disproportionately harmed low-income and BIPOC communities, many of whom are often victims of the crimes facilitated by illicit finance in the first place. This includes the selective application of the AML/CFT regime, such that often, major financial institutions or wealthy individuals have easy access to financial services while avoiding full prosecution or penalties, while ordinary individuals - say, immigrants seeking to send remittances home - face disproportionate restrictions, scrutiny and penalties; and 3) The US lacks comprehensive laws that protect individuals' digital privacy and has a history of regulation and judicial jurisprudence that has greatly undermined individuals' right to privacy as understood under the Fourth Amendment. It is certainly possible that technological approaches exist for developing DLT systems that could provide a measure of privacy for those individuals using a CBDC. However, we believe these technological fixes are unlikely to be sufficient to address the manner by which intrusions into CBDC users' privacy would unfold. One use case for a DLT-based digital currency is that the ledger itself provides both transparency (regarding transaction activity and holdings) and anonymity (with respect to the identity of holders of tokens and/or wallets). There is some validity to this insofar as, at least under some scenarios, law enforcement has been able to directly gather data on-chain, or via intermediaries (exchanges) in order to investigate illicit finance, while at the same time, wallet holders who hold their tokens off-chain in private non-custodial wallets may achieve some degree of privacy (though most individuals still purchase crypto assets with bank deposits, and regulators are asserting some jurisdiction over wallets and wallet issuers). With a publicly issued DLT-based digital currency, in theory such a balance could still hold. Transaction information about digital tokens would exist on a government created chain; tokens themselves would be held in private wallets, likely issued either by private entities (banks, or non-bank payment providers) or by government entities (say, for example, by the post office). However, it is unclear how regulators and the courts would differentiate or distinguish between the privacy protections that exist for an account-based payment system (either through a private institution or government entity) and a DLT-system where individuals hold digital tokens in digital wallets which may or may not be linked to accounts held by private or public entities. In theory, an individual has more assurances of privacy regarding their physical wallet versus what is held in their bank account (though as mentioned elsewhere, privacy rights for one's physical assets are also not secure under current law). However, it doesn't take much imagination to envision how, when all these elements are connected by one stream of data, such distinctions might be eroded, either explicitly (through court rulings or new statutes) or implicitly, through suspension of privacy restrictions in the name of national security; via information sharing agreements between agencies after initial use of the data for a specified purpose; or the deanonymization of flows from digital wallets by cross-referencing such information with other data. The situation becomes murkier when third party digital service providers play a role either on the back end or front end of such a system. Major digital service providers have business models that harvest data from individuals' online activities. Securing access to an individual's financial transaction data record as well would be hard for such companies to resist. As such, we're concerned that legislative or regulatory attempts to bar access to such data would be insufficient or subject to regulatory capture by the industry. Lastly, in the past, such service providers have either offered or have been compelled by law enforcement to disclose data previously deemed private. It's reasonable to assume the same would ultimately hold true for CBDC data collected and stored by such digital service providers as well. In sum, unless there are fundamental reforms to data privacy and financial privacy laws, it will be difficult to ensure that a CBDC, regardless of its structure and concept, can provide sufficient privacy for consumers that is well-balanced with respect to the competing need for access to financial information for AML/KYC purposes.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

14. *Should a CBDC be legal tender?*

15. *Should a CBDC pay interest? If so, why and how? If not, why not?*

16. *Should the amount of CBDC held by a single end-user be subject to quantity limits?*

17. *What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

While we have foundational concerns about the use of an intermediated model overall, one key concern we have is the possibility of non-depository institutions serving as intermediaries. Non-banks (and ILCs) are not held to the same supervisory and oversight standards, and have had problematic records - allowing fraudulent accounts to be opened while also unduly freezing or shutting down legitimate accounts in overreaction; KYC compliance, and other issues. At a minimum, only insured depositories whose parent companies are subject to the Bank Holding Company Act should be eligible to be intermediaries. Even so, relying on intermediaries, as mentioned above, could create problems with credit allocation, expand the Fed's balance sheet, and, ironically, could end up excluding individuals using traditional banking accounts and systems from greater access to preferred financial services. We'd also note that one argument for introduction of a CBDC is to bring government issued money - ostensibly, a public good - into the digital age. Yet, pursuing an intermediated CBDC model could in some scenarios bring about a sort of backdoor privatization of that good, with commercial banks continuing to play an outsized role in determining how financial services are operationalized. Embedding that dynamic within a CBDC system could simply perpetuate some of the existing inequities in our current system. Given these risks, as discussed earlier in this comment, we would generally prefer a system that relies more on public institutions or agencies, such as the Postal Service, the Mint, Treasury or other appropriate agencies, to play an intermediary role if needed. This could help address privacy concerns and conflicts of interest that may be present when private entities play a custodial role, and could also ensure there is a viable public option for a digital currency and payment system that can provide vital public services and good directly to people without intermediaries - an arrangement that can offer resilience in times of crisis when private sector supply chains and production processes founder.

18. *Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

NASCUS

*Industry*

Other: Professional Association

*Country*

United States of America

*State*

Virginia

*Email*

brian@nascus.org

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

As highlighted in the paper, the potential creation of a CBDC raises numerous policy issues. One policy issue that would benefit from more discussion is that of the cybersecurity of, and access to, the data generated by consumer engagement with a CBDC. From a cybersecurity perspective, the potential creation of a central repository of a vast amount of consumer banking data related to CBDC transactions heighten the risk of large-scale consumer information compared to the current commercial bank decentralization of data. While an intermediated CBDC design might mitigate the centralization of all related data, it is likely that material amounts of data related to CBDC transactions would still flow to a centralized database even in an intermediated system. Another policy issue related to the transactional data created by consumer engagement with a CBDC is what regulatory, law enforcement or private sector entities would have access to the CBDC related transaction data. Management of CBDC transaction data will need to balance the need for robust consumer privacy standards with ensuring that intermediaries have access to data needed for compliance obligations and state regulators have access to data needed for supervisory obligations.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

In theory, a CBDC could help reach the unbanked. If the goal is to create a form of digital cash that does not require a bank account, this could be a positive for those without a bank account. However, the Federal Reserve is proposing a CBDC that would be intermediated through the banking system, so it is not clear if there would be any improvement in access for the unbanked. Not intermediating a CBDC through the banking system might resolve the unbanked challenge but would in turn give rise serious concerns about the impact to the legacy banking system's liquidity of a widely adopted CBDC absent the intermediation. Questions related to widespread government access to CBDC transaction data could raise trust issues with unbanked and underbanked. A CBDC could introduce a high level of privacy concerns related to identity verification and recorded transactions and have the net effect of encouraging further withdrawal from the financial system due to heightened concerns about government monitoring. This is one reason the privacy concerns and data governance would be essential to address in a clear and transparent manner.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

A CBDC could easily pose a competitive threat to the legacy banking system. Structurally, our current banking system is one in which the Federal Reserve provides liquidity to the banking system and the banking system provides liquidity to the public. However, a CBDC represents a profoundly different model. Even with an intermediated interface using banks and credit unions, the money itself would be issued by the Fed, not a bank or credit union. Without more details about how a CBDC would be “intermediated” through the banking system it is difficult to meaningfully analyze the disruptive impact of a CBDC. However, in addition disrupting liquidity, a CBDC could also disrupt the NII of legacy banks and credit unions. It will be important for the Federal Reserve to clarify the incentives and fee structure related to financial institutions facilitating access to a CBDC. The Federal Reserve would also have to consider how to ensure that all banks and credit unions, regardless of size, have the opportunity to participate in whatever CBDC framework is established. This might require assisting in tech stack buildouts and other resource intensive infrastructure builds. Without such a commitment, the offering of a CBDC might also exacerbate the challenges confronting modestly sized institutions.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

The Federal Reserve should give some thought to the fee structure related to the intermediation of the CBDC. Financial institutions should be paid some fee for processing transactions in the CBDC. This would help mitigate some of the direct competitive effects. See response to question 6.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Chartered banks and credit unions should serve as intermediaries for CBDC. It would be helpful to begin with these regulated institutions before expanding the intermediation to non-banks. This could help mitigate the potential competitive threat to depository institutions. If depository institutions are the gatekeepers to CBDC, they would still have an important role to play in the financial system.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

19. *Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

21. *How might future technological innovations affect design and policy choices related to CBDC?*

22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

Matt Kemp

*Industry*

Bank, Large (\$90 Billion or More in Assets)

*Country*

United States of America

*State*

Illinois

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

In the "efficacy of monetary policy" section it discusses the way that a CBDC may impede the current monetary policy tools. I think some consideration should be given to the fact that given an interest bearing CBDC the Fed may have a much more direct method to implement monetary policy as it could instantly impact the rate at which saved money earns interest, rather than waiting on updates to the federal funds rate to proliferate through the economy

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

The technology required to utilize a CBDC (smart phone, high speed internet or wireless network access) could result in negative financial inclusion impacts

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

Users could automatically be assigned a unique identifier that does not have PII in it. The Fed can have more descriptive PII data, but this anonymous unique identifier could be used to track account balances in a public blockchain that would allow the Fed to take advantage of the benefits of a blockchain structure.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

*14. Should a CBDC be legal tender?*

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

I think including interest would make for a more effective product because more control could be had over the rate that holders of the currency can save. Banks could always offer higher rates of return or other favorable conditions to have people keep money with them. This could result in net positive benefits for financial services. Consideration would also have to be given to how the interest would be funded by the central bank.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

While this would be ideal, I think a more effective solution would be to create this with online functionality only first, and do research on areas where wireless network connectivity would be at risk and perhaps this could be a catalyst to have government help increase resiliency of wireless networks. Offline functionality would introduce a lot of risks and would have to be thoroughly designed, vetted, and tested.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

Yes, otherwise other recent payment technology would be used in place of it. Products like Apple Pay have identified ways to quickly verify identity and process payment, I would look to replicate that product, or even see if a tech company would be willing to sponsor it and leverage its existing technology and network.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

*21. How might future technological innovations affect design and policy choices related to CBDC?*

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*Name or Organization*

*Industry*

Academia

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United States of America

*State*

Wisconsin

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

See attached response submitted by email. Kent Mollenkamp Guest Auditor

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

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20. *How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*
21. *How might future technological innovations affect design and policy choices related to CBDC?*
22. *Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

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*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

Additional Benefits and Policy Factors 1. Improved Payments 1.1. Improved access Provide th unbanked, seaman and those in remote areas, instant, global and efficient cash. 1.2. Safer a. Recover lost funds without a third party via backups – when a wallet is lost stolen, a second device holding a backup can automatically transfer the funds to a safe address. b. Anti-crime – immutable logs and identity systems can reduce welfare fraud, mon laundering, and shadow banking crime. Where courts issue freezing orders, specified funds cannot be spent, allowing recovery from illicit activity. c. Financially stable – address risks from stablecoins, anonymous coins and today's fragile systems. d. Health-conscious – reduce disease transmission risks associated with physical cash. 1.3. Cheaper Micropayments. 10x cheaper than cards. Costs will decrease further as volumes scale. Sub-20¢ payments will power new industries (see 4). 1.4. Faster Near instant global payments. 1.5. More resilient and available "Anywhere, anytime". 100% uptime. Trade during outages thanks to offline payments. 1.6. New payment types a. Micropayments – see 1.3. b. Multi-party – pay all parties on events. Unlocks real-time taxation. c. Peer-to-peer – like handing someone cash. Avoids relying on fragile, distant servers. d. Offline – instead of "cash or lose the sale" merchants can accept offline payments with reasonable credit risk via a simple client and broadcasting on reconnection. Thresholds (lower values only) can reduce risk further. e. Programmable – new innovation and competition opportunities, increased policy scope and effectiveness, improved latency and fraud protections. 1.7. Inclusive People without phones or bank accounts can enter the economy with less friction (smart cards). 1.8. Improved cross-border payments. From days to milliseconds; 9-5pm to 24/7. 1.9. Improved privacy Via the AML/CFT compliant New Privacy Model (Nakamoto, 2008). 1.10. Immutable traceability Unalterable evidence trails. 2. Improve Monetary Policy 2.1. Programmability Convert \$20 notes to \$19. See 1.6.e. 2.2. Programmability Programmable now and in fifty years. A foundation for stability. 2.3. Instant rate changes See 2.1. 2.4. Zero-lower bound Cashback (Skovorodov, Retail CBDC Cashback Rate and Optimal Monetary Policy, 2021) can expand policy and avoid deflationary spirals. 2.5. Real-time insights Atomic data (location (merchant to country), source (KYC), etc) enables new insights (currency audits (minting to last payment), improved liquidity and asset programs, etc.) without compromising privacy. 2.6. Improved precision Impact price distributions instead of sector averages (Skovorodov, 2021). 3. Improved Fiscal Policy Empower innovative governments and Treasuries. 3.1. Frictionless real-time taxation and rebates From burdening payers with tracking, reporting, and paying tax and rebates, to automatic multi-party payments. 3.2. Fiscal transfers Bypass indirect transmission to achieve objectives more directly (Jones, Pandemic pushes CBDC into top gear, 2020) whilst reducing cost and risk. 4. Accelerate Innovation Unlock new industries, innovations, and growth. 4.1. New business models and industries a. Transaction Processing: delivers micropayments, jobs, price improvements and sustainable energy. b. Interoperable services: Digital Passports will remove friction, save time, cost, and privacy across all industries. c. Micropayment industries: a new economic era. The internet after ads. See <https://nchain.com/creating-the-internet-of-value-through-bitcoin-data-interchange-and-iot-technology/>. d. Direct models: micropayment fees. Pay-per: byte, watt, CPU-cycle, etc. e. Indirect models – providers cover costs for other benefits (new customers, data, interactions, etc.). 4.2. Improved PKI (KYC/AML) From annual checks to instant revocation of (invalid KYC, AML, etc) certificates with "9000 certificate issuances, revocations, or updates per second at a cost of less than 0.005 USD per event" (A Blockchain-Based PKI Management Framework, 2018). 4.3. Enhance existing banking systems CBDC does not replace banks nor threaten bank money, but can improve bank efficiency, settlements, issuances (credit, bonds),

etc. 4.4. Improved compliance Automated audits, real-time compliance, triple-entry accounting real-time reporting etc will free labour to pursue new growth. 4.5. Improved accountability Staff committees, etc can issue, hash, timestamp (to the blockchain) and distribute (publicly or privately): orders, reports, legislation, etc. 4.6. Less crime, errors, and fraud CBDC and connected services (see above) will reduce crime, errors and fraud, improve stability and prevent risks in real-time. 5. The USD's international role See Q2. Risks 1. Design error Ignorant public ledger transcendence of legacy trade-offs; incentivising waste (private ledgers, Proof of Stake); blocking innovation (lock-in effects, platforms over protocols), etc. 2. Class systems See Q2.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Although some of CBDC's potential benefits could be delivered by the private sector (albeit with credit and liquidity risk), there are social, speed, and geopolitical advantages of reasonable government involvement. The United States' and Federal Reserve's participation in CBDC is vital in setting the USA's (yet to be determined) Web3 policy framework, which will have significant impacts on global commerce and the Dollar's international role. In the new Web3 internet era of decentralised networks and thus, decentralised ownership, the opportunity for innovation will flourish. The Federal Reserve can, and arguably should, play a critical role in protecting US citizens and their economy because Web3 ownership and control is more peer-to-peer and decentralised. "Decentralization is a commonly misunderstood concept. For example, it is sometimes said that the reason crypto network advocates favour decentralization is to resist government censorship, or because of libertarian political views. These are not the main reasons decentralization is important" (Chris Dixon, *Why Decentralisation Matters*). Users and builders can now have digital ownership and control of data and services using a variety of fungible and non-fungible tokens. The Federal Reserve and Treasury may wish to regulate such tokens to improve the discharge of duties, provide protections and more. Because of the immutable ledger's new architecture and thanks to programmability, executing these functions need not compromise efficiency gains nor cost reductions as observed in traditional payment and settlement systems. By taking a thoughtful approach that considers these advances, the US Government can become significantly more effective and efficient in serving its citizens. In doing this, to mitigate the risk of a class system, the Federal Reserve Act and possibly the Currency Act may programmatically extend the issuance of more than one form of money which is at par with cash. However, the United States will be unlikely to realise even base benefits if persuaded by the many entities who stifle innovation and growth by avoiding the significance of the choice of ledger technologies or by framing the ledger question around centralisation – that is, the choice between centralized ledgers, decentralized ledgers (distributed ledger technology) or a combination thereof. Why? Because this framing hides the most significant innovation in the history of digital ledger technologies since their inception: the world's first public immutable ledger. That is, a peer-to-peer solution to the double spending problem that lowers the digital payments cost floor to micropayments, introduces a New Privacy Model (providing markets with choice of an alternative to reliance on trusted-third parties), and delivers true data security and data integrity because the ledger cannot be changed (Nakamoto, 2008). Stewards of the public interest will recall that private encrypted communications can occur over a public channel and that much wisdom can be found in answering the question: why do we make things public? It is also contextually helpful to acknowledge that it was Nakamoto's breakthrough in ledger technology that not only initiated the global interest in digital assets and then CBDC, but provides the key to realising the potential of CBDCs, reinvigorating the social contract, and unlocking a new era of trade, innovation and prosperity for honest people and governments. Consider for example:

- How can a U.S. CBDC that does not utilise the New Privacy Model (Nakamoto, 2008) hope to match the privacy benefits compared to others that do?
- Could a U.S. CBDC relying on the internet's fragile security model, reversible databases and innovation blocking architectures, that are slowed by excessive network hops and fragile to internet outages, compete with the operational resilience and cybersecurity benefits of competing CBDCs which leverage the world's next generation network?
- Would the United States be able to meet the future needs and demands for payment services or consider itself fully supporting the Dollar's international role by settling for anything but the most powerful, efficient and innovative technologies? The evolution of finance in the United States and abroad has resulted in a tight coupling between electronic payments and the credit system and a decoupling of credit creation and scarcity. Corruption, infiltration, fraud and money laundering remain ongoing challenges for even the most advanced states and many of the outcomes reaped today have their seeds in the policies of the past. CBDC on a public immutable ledger could provide the United States with a new system that can operate in parallel to, and as a bridge from, status quo legacy systems, to a more efficient, resilient, and productive future that values merit, honesty, and a level playing field.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Yes, CBDC operating on a public immutable ledger that is capable of micropayments and the New Privacy Model (Nakamoto, 2008) can improve financial inclusion with a net positive impact by addressing barriers to inclusion. CBDC can fundamentally change inclusion, assist the homeless and improve the lives of the most vulnerable people in society. 1. CBDC benefits to financial inclusion 1.1. Improved accessibility CBDC offer a highly inclusive and scalable gateway to provide the unbanked and under-banked with access to electronic payments and a wide variety of products and services. Instead of typical branch work-hour constraints (9am to 5pm, 5 days a week), CBDC can offer 24/7 payments, anytime, anywhere. The unbanked, who receive payment in cash, can choose to receive CBDC (digital cash) and send it to family or friends or otherwise use it without the overhead of visiting a bank in person. Overseas servicemen such as seamen need not be required to arrive at their destination before being able to receive and send funds. These types of transactions are significantly more expensive in physical cash. CBDC can maximise financial inclusion via integrations with: a. USSD (Unstructured Supplementary Service Data) to allow CBDC text message support via the Global System for Mobile Communications (GSM). b. Web and smart phone applications. c. Smart cards and devices – to provide a very low-cost way to deliver CBDC to non-phone users which can additionally support government agency onboarding, and welfare, food stamp, transport and other programs. 1.2. Fees and cost CBDC operating on a public immutable ledger enables true micropayments, that can eliminate or substantially reduce any cost objections or barriers to economic inclusivity. 1.3. New services and innovative solutions Innovative private and public sector solutions (including a wide variety government agencies) can further improve inclusion by allowing people with and without phones or bank accounts to enter the economy with less friction, more availability and more security, such as by using smart cards and other innovative capabilities and devices. 1.4. New revenue opportunities and business models CBDC can help create a world where anyone can quickly, easily and securely setup a small website and begin earning CBDC for their small business. New business models enabled by CBDC and the micropayment economy will enable people unable to leave their homes and those in remote areas to participate and earn money in new industries. Reduced compliance burdens will lower barriers to entry and allow participants to seamlessly pay taxation at the source. 1.5. Addressing trust, privacy and KYC concerns CBDC approaches not utilising the breakthrough capabilities of public immutable ledgers seem unlikely to improve financial inclusion because relying on the trusted-third-party privacy model transfers private information away from the security of the individual and establishes a cost floor which limits payment efficiency and prevents micropayments. In October 2021, the House of Lords Economic Affairs Committee inquiry into the Central Bank Digital Currencies commenced with the issue of privacy. When Lord Bridges inquired about banks and other institutions providing KYC services, a known barrier to financial inclusion, David Birch responded, “you’d have to present me with some pretty concrete evidence that the current system actually works before we decided to replicate it in CBDC. I imagine CBDC as being built as a parallel system. Not on top of the existing system. And if you look at the amount of money that’s spent on KYC, AML, CTFP... in the current system compared to the criminal funds that are intercepted, it’s not a cost benefit analysis that would be considered acceptable in most businesses”. Given existing critiques concerning cost efficiency (Ronald 2018, Anti-money laundering: The world's least effective policy experiment? Together, we can fix it) coupled with the known risk of significant loss of privacy (for e.g., DigiNotar 2011), this space warrants further research and investigation. 2. Net benefits for financial inclusion Informed by history, we suspect that the net effect of CBDC on a public immutable ledger utilising micropayments and the New Privacy Model will deliver net positive benefits for financial inclusion, both domestically and internationally and could play a critical role in supporting and extending the Dollar's international role. Since the question of whether the net effect is positive or negative for inclusion depends on a variety of factors interacting in a complex environment, and given the significance of the issues at play, we recommend the Federal Reserve and United States invest in researching what impacts the New Privacy Model and micropayments might have for a U.S. CBDC. If you would like to discuss further, please contact us and we would be honoured to provide further assistance.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

A well designed CBDC will provide powerful new tools for assisting the Federal Reserve to more effectively implement its monetary policy in pursuit of its maximum employment and price stability goals, including. 1. Immediate policy rate changes – through remunerated or "interest-bearing" CBDC. In cases where cash is not readily available, it could also provide a delivery mechanism for negative interest rates. 2. A new monetary policy tool addressing the zero-lower bound – via conventional monetary policy and cashback payments on expenditures paid in CBDC, see Skovorodov (2021). Potential benefits include an increase in policy space, reduction of incidences of effective lower bound and avoiding deflationary spirals. 3. Direct transfers – could bypass existing limitations of indirect transmission (such as

delays and agency problems), to achieve policy objectives more directly, such as in the case of financial aid during covid-19, though would likely require an integrated national identity system. 4. Real-time monetary and economic data and insights (traceability) – CBDC could address traceability limitations of physical cash such as, such as answering questions like: a. Where are the banknotes and coins? b. How often is it used? CBDC metadata concerning payment locations, costs, flows, sources of funds (for KYC and AML compliance) and other information can power a new era of real-time public monetary and economic insights. Who owns, controls and can access this data can be managed with atomic precision, allowing for a tiered approach that respects individual privacy, KYC/AML requirements and provides society with the ability to audit currency from its initial minting to the last known transaction in-real time. This unlocks new possibilities for improved economic management, liquidity operations and asset purchase programs (improving traceability and reducing capital flight) and much more. 5. Improved precision in dealing with sectoral issues – CBDC could enable atomic precision in the monitoring and management sectoral fluctuations in prices. CBDC could act as contingent monetary instruments with sectoral conditionality, impacting the distribution of prices as opposed to their average level and directly incentivising final consumption expenditure decisions of households that might deliver higher welfare levels than under the current status quo (Skovorodov, 2021). Finally, CBDC issued on a public immutable ledger, though lowering fees to micropayments (significantly lower than the Visa and Mastercard networks) can enable new business models, presenting a parallel means of improving employment.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

CBDC is a controlled coin. All CBDC can be traced (by geography and other attributes as desired), frozen, thawed, recalled, etc. CBDC facilitates non-bank banking, without inherent risks associated with shadow banking, due to system-wide transparency and implicit policy adherence at point of execution. CBDC, if delivered on a public immutable ledger (see Nakamoto, 2008) that is separate from the legacy system, could improve financial stability by decoupling large sections of the digital payment system from the more fragile credit and banking system, improve contract enforcement, and facilitate the transition of the public and private sectors to a significantly more private, efficient, and innovation friendly architecture. It is worth noting that the Federal Reserve's definition of "financial stability" ([federalreserve.gov/financial-stability/what-is-financial-stability.htm](https://www.federalreserve.gov/financial-stability/what-is-financial-stability.htm)) emphasises credit, accounts, cash management and underwriting services whereas the Bank of England's stresses the "vital services that the real economy demands from the financial system (which comprises financial institutions, markets and market infrastructures)" and specifically calls out payment and settlement systems ([bankofengland.co.uk/financial-stability](https://www.bankofengland.co.uk/financial-stability)). The tight coupling between electronic payments and the credit system is a critical vulnerability and threat to financial stability that a CBDC operating on a separate and independent payment rail could start to address. Additionally, a programmable CBDC could further improve financial stability by reducing or eliminating threats to stability upstream, via the automated enforcement of CBDC terms and conditions – spanning issuance, monitoring, reporting, seizure, compliance with court orders, and other critical management operations. CBDC programmability means the law itself and terms and conditions get written into the CBDC. This unlocks significant opportunities for governance and economic efficiency. For e.g., prohibited actions can be stopped before happening, financial statements and audits can be conducted in real-time, tax collection can happen automatically, and past events can be replayed or set to a specific point in time. Regulatory and governance requirements (as they apply at any given moment) can be enforced with unprecedented scale, integrity and efficiency in real-time. And the immutable evidence trail allows for replaying events to a specific outcome or point in time. Consider the following governance examples and the associated implications for financial stability: a. Monetary policy terms and conditions – the Federal Reserve could trace and replay events from a monetary policy meeting, to the moment of transmission, to how transmission flowed across the financial ecosystem in the seconds to years following. b. Compliant or approved uses – if the Federal Reserve specified that CBDC could only be used for compliant products (based upon an immutable and integrated registry), they could prevent fraud and mistakes arising from trading non-compliant assets. Imagine for e.g., the situation where a CBDC user wished and attempted to purchase a non-compliant mortgage-backed security (MBS) from a provider. Programmability could require that the user's payment queries the government MBS registry and, upon finding that the provider is non-compliant, notify the payor. By doing this, the government could help commerce advance beyond the reputation of firms alone by enabling real-time, immutable, and automated due diligence. This would also decrease the potential for moral hazard by protecting the victims in society who otherwise pay for these mistakes. If the idea of moving beyond a 'buyer beware' reputation policy model to one of integrated real-time registries sounds extreme, remember that the SEC stipulated that Pension funds should only trade in Triple-AAA (reputation) rated securities. And yet, those same rating agencies afterwards, claimed that their Triple-AAA rating was covered under

Freedom of Speech. It remains difficult to see how a commitment to a steady decline in purchasing power coupled with a credit system that facilitates unproductive money creation can avoid the eventual costs of financial instability necessitated by such policies. However, a CBDC could provide a net benefit in assisting honest governments in transitioning towards a more stable and resilient economic order and is absolutely worthy of further research and investigation, which we should be delighted to assist with upon request.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

1. CBDC CBDC does not replace banks and need not adversely affect the financial sector. CBDC is an improved and digital version of physical cash: faster, programmable, traceable, and significantly more efficient. CBDC can deliver net benefits to the financial sector and reduce costs and crime associated with physical cash. Public immutable ledgers can extend these improvements more broadly to the financial sector through triple-entry-accounting and improvements to bank money, bond issuances and other debt products. A non-interest bearing and more cash like CBDC, mimicking physical cash, is least likely to adversely affect the financial sector and most likely to provide the greatest array of benefits without additional risks. 2. Unnecessary bank runs? One alleged source of adverse risk to the financial sector is that CBDC could threaten bank runs by reducing deposits which banks require in order to remain compliant with capital and reserve requirements regulations. These capital and reserve requirements have historically been justified as reasonable measures that seek to reduce bank run risk arising from the fractional reserve theory, and later the intermediation theory of banking. However, these theories have been empirically challenged and questioned (Werner, A lost century in economics: Three theories of banking and the conclusive evidence, 2016), casting doubt on whether this risk is real or superfluously self-inflicted. If the credit creation theory is correct, as the Bank of England has suggested (Money creation in the modern economy, 2016), perhaps the risk of bank runs can be eliminated entirely by reassessing existing regulations in light of these economic revelations. Even with such regulations, "this bank-run scenario is highly unlikely" thanks to deposit insurance programs (RBA, Retail Central Bank Digital Currency: Design Considerations, Rationales and Implications, 2020). 3. Stablecoins Stable coins have credit and liquidity risks that a CBDC might not and could operate in a way reminiscent of the Scottish Free Banking and American Free Banking Era (1838-60), with competition and redeemability in part addressing problems of over issuance ("wildcat banking") (Reputation Formation in Early Bank Note Markets, 1996). However, such systems still suffer from moral hazard, which seems significant in today's environment, and a lack of transparency and protections. The largest stablecoin as of this submission, Tether, with a market capitalisation of almost \$80B, is one such example. Tether initially assured the market they were fully backed by USD but by April 2019, an affidavit lowered this to 74%. By 2021, it was 2.9% (Financial Times, Tether says its reserves are backed by cash to the tune of... 2.9%, 2021). As with Tether and the shadow banking system more broadly, we have little insight into the mismatch in maturity dates of assets and liabilities and the potential for a crisis. In 2022, the Terra stable coin lost over 90% of its value in a short period. Some have speculated that a large player caused this collapse to profit from it (WSJ, Crash of TerraUSD Shakes Crypto, 2022). While unproven, this does highlight the possibility that essentially anonymous players could crash stablecoins. Many small investors lost large amounts of money and this could've been avoided or mitigated if the Federal Reserve had issued a U.S. CBDC allowing the market to choose a risk-free alternative to such opaque and risky instruments. 4. Non-bank money and the blockchain Other forms of non-bank money, including digital assets such as Bitcoin, seem unlikely to adversely affect the financial system because Bitcoin is a peer-to-peer electronic cash system. It is not a currency, does not negatively impact banking nor the credit system, and does not preclude or prevent any state from governing their financial system. Bitcoin has a fixed supply, and whilst it can encapsulate or run flexible issuance systems within or on top of it, it is not a debt system. Contrary to popular opinion, Bitcoin has no encryption, is recoverable by court order, and can be seized by police and authorities. The introduction of the public immutable ledger (blockchain), micropayments and an immutable evidence trail does provide an infrastructure that could advance, de-risk and improve the existing financial sector by reducing or eliminating legacy system payment fees and attack vectors which allow for various types of fraud, crime and errors. To appreciate the transformational power of what the blockchain can do for the financial sector, consider the following questions: • Why should a financial sector intuition ever need multiple different copies of their accounts or books? • If we now have a fast, secure, private and highly efficient way to ensure that financial sector institutions have one set of books, such that Enron, Madoff and countless other financial frauds could not have happened, could state allowing the means for such deceptions to con

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

Firstly, CBDC should take the form of digital cash, that is, a non-interest-bearing bearer token, because this form is most similar to physical cash and allows banks to continue offering interest on any CBDC deposits, thereby mitigating the potential for adverse impacts. Secondly, limiting the amount of CBDC held by any one person, giving it an expiry date, or providing dynamic interest (which could become negative) could potentially mitigate adverse effects. Thirdly, as discussed in our response to Question 6, shortcomings of the financial sector should not unduly restrict nor constrain the advancement of systems that improve the overall wealth, resilience, and efficiency of society. Unless it can be empirically demonstrated that the either the financial intermediation theory or fractional reserve theory is empirically correct and the credit creation theory is incorrect (Werner, A lost century in economics: Three theories of banking and the conclusive evidence, 2016), then capital adequacy and reserve requirements regulations seem worthy of re-examination in favour of more empirically sound policies. Addressing root cause problems of the financial sector may prove to be the most powerful and effective tool for reducing crises and advancing real economic growth arising from the financial sector and seem likely to significantly outperform the alternative strategy of seeking to limit promising new technologies. Finally, as the question suggests, adding friction to a CBDC, such as through excessive KYC and compliance that does not mirror physical cash (such as holding limits) could significantly detract from the benefits of CBDC and at the extreme, so destroy its demand as to defeat its purpose entirely.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

If cash usage declines, it is important to preserve the general public's access to a form of central bank money that can be used widely for payments. Private enterprises can and do play an important role in providing services that central banks do not. However, such enterprises over the long term have, for the most part and for various reasons covered by the BIS and others, generally failed to provide more trusted and sustainable monetary products than the public sector and central banks. As with the postal service, electricity, railroads, and many other industries which have passed from private hands to state monopolies and back again, there is significant value in reasonable and empirically justifiable regulation. Denationalisation is generally regarded by economists as more efficient and productive, and in part explains the decline in physical cash in some but not all economies. However, preserving the general public's access to digital cash through a CBDC could be advantageous for fiscal, monetary and other reasons. For example, enhancing payment system resilience, could, in the case of an internet outage or collapse in the credit system, provide a parallel system through which commerce could continue. It's important that the Federal Reserve supports digital cash to facilitate micropayments in the national currency on the blockchain because banks and other financial institutions alone are not able to do this for the USA like the United States government can. There are certain payments that Nakamoto called "small casual payments" that legacy providers have been unable to provide. A CBDC would be the perfect medium for these transactions in the United States and for the economies of the future. As new business models emerge that require say, the payment of 1 cent, it will be beneficial to pay for such services using the U.S. national currency. For example, instead of Software as a Service subscriptions, you will be able to pay 1 cent or more to read a single article, webpage, data field or other piece of content. A well designed and constructed CBDC can provide this and introduce new people (the unbanked) and new services (that were previously uneconomically) to the economy. The introduction of the public immutable ledger also provides compelling fiscal and other innovative reasons for preserving access to central bank money in the form of a CBDC for innovative states seeking to advance economic growth and facilitate new industries and jobs. For more detail, we recommend seeing our other responses, in particular, to questions 1, 4, 10, 12, and 13.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

If the Federal Reserve does not issue a U.S. CBDC, domestic and cross-border digital payments might evolve in ways that undermine the international role of the U.S. Dollar, exacerbate risks posed by stablecoins, money laundering, terrorist financing, child sexual exploitation and other crime, and strengthen existing monopolies and business models. 1. Loss of U.S. monetary sovereignty Failing to issue an efficient, flexible, and innovative CBDC will likely result in a gradual loss of monetary sovereignty as the market increasingly migrates to competitive private or public international mechanisms (including stablecoins, other new entrants from large technology providers or foreign CBDCs) that may also harm U.S. financial stability. In some cases, certain jurisdictions may lose control over monetary matters (Brunnermeier, et al, Measuring and Allocating Systemic Risk, 2019), (G7, IMF and BIS, Working Group on Stablecoins Investigating the impact of global stablecoins, October 2019). Even in cases where a globally preferred stablecoin is denominated in U.S. Dollars, the payment system and its associated data may not be. And even if it is, users would still be

exposed to its counterparty risk, presenting a threat to U.S. citizens and the financial stability of the U.S. economy. 2. Increased crime Whist CBDC on a public immutable ledger can disincentive crime, a lack of CBDC and a failure to crack down on anonymous privacy coins may increase crime. For example, the UN's Office on Drugs and Crime, warns anonymous crypto-currencies have made fighting criminals involved in global child sexual exploitation networks harder by adding a new layer of secrecy that favours criminals (ABC, Crypto-currency makes child slavery trade harder to break: UN, 2019). Untraceable 'privacy coins' such as Monero may continue to pose problems for law enforcement and empower ransomware gangs, money launderers, and the sale of guns and drugs (Financial Times, Monero emerges as crypto of choice for cybercriminals, 2021). 3. Continued dominance of pay-with-privacy monopolies and business models The lack of a U.S. CBDC may further consolidate the dominance of pay with privacy monopolies and business models, especially big tech internet and social media firms. Without a U.S. CBDC enabling U.S. entrepreneurs and citizens to more easily advance beyond the ad-based tragedy of the commons on the internet today, ruled by 'pay with your privacy' business models – which are often marketed as 'free services' – the U.S. may remain limited to existing incumbents who have the power to own and control nearly everything you do online. 4. Continued dominance of card networks and payment providers The absence of a U.S. CBDC may further consolidate and entrench card networks and existing payment providers' power over the digital payments space.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

The question of how should decisions by other large economy nations to issue CBDCs influence the decision on whether the United States should do so depends on a variety of dynamic factors in a continuously adapting environment. One important and perhaps underestimated area of interest concerns their choice of ledger technology when issuing CBDC because this may have under appreciate geopolitical and national security consequences. For example: a. What is the underlying ledger technology they used to issue their CBDC? Is it a public immutable ledger (public blockchain) or a permissioned mutable ledger ("permissioned blockchain", Proof of Stake system, etc.)? b. Are these large economies offering their infrastructure as a platform for other states of geopolitical interest to launch their CBDCs? And if successful, does this provide them with some informational or other strategic advantages? The answer to the first question is useful because CBDC on a public immutable ledger is more likely to strengthen global interoperability, trust, trade, and efficiency whereas CBDC on a mutable ledger is more likely to result in fraud, higher costs, and high barriers to entry. All these factors impact the United States' interests. Dishonest regimes will almost certainly opt for conventional mutable ledgers because they allow for two key flaws that fundamentally undermine security and efficiency: 1. Mutability – the ability for good or bad actors to rewrite the digital ledger's history. Despite the best efforts of accounting and database management regulations, auditors and judiciary systems, digital ledger mutability necessitates errors, fraud and crime; and 2. A 'Governance Ledger Management' conflict of interest – the conflict of interest arising from allowing one party to be responsible for both ledger management and monetary governance. Despite the best efforts of payment systems, regulations, and tender processes, coupling these responsibilities in one entity incentivises anti-competitive behaviour, removes the ongoing incentive for efficiency, innovation, and competition with respect to the ledger management, and allows the governance system to corrupt its own ledger. Western republics have long realised the value of separating governmental power by function or specialisation – for e.g., the executive, judiciary and legislature – and implementing publicity and transparency as a control to balance powers with accountability. Nakamoto applied this strategy to the domain of ledger technologies, taking it to its logical Schumpeterian end: an open transaction processing market organised by a unilateral agreement. This created a new kind of ledger system that incentivises and promotes honest governance by decoupling the Governance Ledger Management conflict of interest into two separate participants: a. Transaction Processors – who compete in public to manage the ledger (so that errors, fraud, and other attacks can be more easily detected and actioned); and b. Token issuers – who manage their own monetary or token system policy using the ledger. As a thought experiment, imagine you are a steward of the public interest faced with the choice of procuring the same fundamental transaction processing service. Which approach is most likely to generate the greatest innovation, competition and efficiency over the next decade: a 10-year lock-in contract with a single private provider or an open marketplace where an unbounded number of market participants compete furiously to win successive 10-minute contracts for service? The legacy, Proof of Stake approach to transaction processing – to award a 10-year lock-in contracts to a single contractor – incentivises idleness, because, having won the contract or tender with a single investment, there is no compelling incentive to continue to innovate or improve efficiency beyond the base terms during the contract's term. Such contracts may last decades or even longer. For example, the UK's recent RTGS tender is scheduled to last 16 years. By contrast, the public DLT approach incentivises ongoing competition, innovation, efficiency and inclusiveness

because each Transaction Processor must compete to produce and claim the next block every 10 or so minutes. Organisations have long used service agreements with multiple providers for utilities such as energy and water. They may now extend this practice to digital payments. A challenge for the United States and other common law jurisdictions is that special interest groups and factions, may, if allowed, seize and hijack CBDC infrastructure for their private benefit at the financial and opportunity cost of the public. If the United States, its allies or other states concerned about the risks of communism and totalitarianism, see an increasing number of states choosing to issue CBDC on private mutable systems offered as infrastructure by large economies, this might influence their decisions concerning CBDC and how to ensure honest governments

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

1. Agency problems One important additional way to manage the potential risks associated with CBDC is to reduce the potential for agency problems by ensuring that CBDC operates on a public immutable ledger instead of traditional mutable legacy systems because this approach decouples and reduces conflicts of interest arising from having one party manage both ledger management and other policies. For a deeper understanding, see our response to Question 10. 2. Reassess theories A second way to manage the potential alleged risks of associated with CBDC is to check and review whether all of the underlying axioms framing the risks and questions are empirically supported. For example, is Werner correct in stating that the intermediation theory is not empirically supported and that the credit creation theory is? (Werner, Can banks individually create money out of nothing? — The theories and the empirical evidence, 2014) and (Werner, A lost century in economics: Three theories of banking and the conclusive evidence, 2016). If yes, then given central bank objectives to deliver financial stability and maximum employment, existing policies should be reassessed, and additionally, Questions 5, 6, and 7 and their answers deserve review, to mitigate any potential for unnecessary compromises to financial and economic stability arising from theory and associated policy errors. 3. The public immutable ledger The transparency of a public immutable ledger, without compromising the ability for privacy, can also manage a wide variety of risks through disincentivising, reducing or eliminating crime, fraud and errors. Fraud is harder to perform and easier to prosecute on a public ledger because of its inherent transparency and immutable evidence trail time stamp server system (Haber, How to time-stamp a digital document, 1991). With increased risks of being caught, crime and fraud can be minimised, and the risks of database corruption significantly lowered or eliminated. Also see our response to Question 13.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

CBDC can introduce a new era of improved privacy to consumers without providing complete anonymity nor facilitating illicit financial activity by utilising the New Privacy Model (Nakamoto, 2008) and a public immutable ledger instead of a conventional mutable ledger. This breakthrough approach enables the following. 1. CBDC users can own and control their data with unprecedented flexibility and in compliance with the law. Instead of the private sector monopolising digital payment dataflows and associated value, CBDC can improve user privacy and return some or all of the value payers help create through their purchases back to the individual and the public sector. For e.g., by providing central banks with anonymised access to certain anonymised data fields, such as EMVCo message fields, including payment amounts and merchant IDs to power real-time economic insights. This new and more flexible approach allows CBDC to provide digital payments without exposing the same amount of data to the financial industry as occurs in today's banking and card networks and with the potential to significantly lower illicit financial activity. 2. Unmatched convenience and transparency through new levels of interoperability and the ability to see an immutable record of which parties have read access to their specific data fields. Today's apps are siloed. An innovative approach to CBDC privacy – see the New Privacy Model (Nakamoto, 2008) – could unlock a new economic era of data portability between services, advancing competition, innovation, and consumer choice across all industries. Data portability is your ability to control and move your data. Few systems today offer real-time and rich data portability. Various systems preserve technology lock-in effects by ignoring data portability. Entire classes of frauds, risks, errors, and frictions can be eliminated from the payment experience, significantly improving the safety, efficiency and convenience of payments. For e.g., instead of requiring customers to continually disclose private information to merchant after merchant by filing out form after form so that each merchant can meet their KYC obligations in their own isolated systems, customers need only swipe a button or otherwise show their prior KYC verification. The merchant can then store and show to this verification to authorities on request. 3. Law enforcement and other parties can maintain necessary oversight controls with improved accountability through tiered access to atomic data fields. Law enforcement can

execute and order the unlocking of specified information that is also recorded onto the blockchain to achieve KYC and AML compliance, thereby balancing public powers with new levels of accountability to prevent corruption and abuses of power. 4. A new era of identity service providers can deliver improved and interoperable KYC, AML and CFT services through non-interactive verification and zero-knowledge proofs. Instead of trusted-third parties holding all their clients' personal information for which they must manage KYC, AML, and CFT in addition to their normal service offerings, the New Privacy Model can help identity providers operate with improved interoperability and efficiency, freeing up non-identity services to focus on their core business. For example:

- Identity service providers can continue offering KYC, AML, and CFT to clients such as when they apply for a new account or service, but now using zero-knowledge identity proof certificates that are timestamped on the blockchain.
- A user can use CBDC to pay for transactions pseudonymously below existing cash KYC and AML laws without requiring identification. And when transaction thresholds are reached and exceeded, merchant request to pay templates can automatically request and receive KYC and AML certificates from service providers that can verify the buyer's identity without engaging the issuer directly nor leaking private information (non-interactive verification). Modifying the routing of identity information in this way allows society to adopt a new separation of powers in the identity industry that can reduce risks of totalitarianism and the descent into social credit systems. This approach also allows CBDC to address the root cause of distrust that remains a barrier to further financial inclusion. States could alternatively limit their CBDCs to the trusted third-party model which undermines privacy by transferring personally identifiable information to centralised databases that, with growth, become increasingly attractive targets for hackers. The genius of Nakamoto's approach is to invert the fragility of the legacy approach that incentivises attack with scale, to a model that protects it with scale. With this novel approach, private information is stored towards the edges of the network, making it harder for attackers to steal your information yet allowing authorized parties – users, merchants, authorities – to maintain authorised access.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

CBDC can be designed to maximise operational and cyber resiliency by operating on a public immutable ledger because this eliminates legacy system trade-offs (also see our response to Q22). Legacy payment systems suffer from at least five root cause flaws including: 1) the internet's fragile privacy and security model; 2) reversible ledgers and databases; 3) a closed and innovation blocking architecture; 4) delays due to excessive network hops; and 5) fragility to internet and network outages. The world's first public immutable ledger, introduced by Nakamoto in 2008, addresses these problems, enabling a new era of improved operational security and resiliency. By eliminating central points of failure, reducing the number of participants needed to validate and process transactions, simplifying transaction validation, clearing and settlement, and minimising the number of payment gateways required to accept payment, Bitcoin (BSV) has achieved unmatched resiliency with a track record of over 11 years continuous uptime. We identify five reasons why the public immutable ledger can deliver unmatched operational resilience and will likely make conventional mutable ledgers obsolete:

1. Interoperability As E&Y quipped, "If everyone is starting their own network, eventually these disparate networks will need to work together to get anything done, which introduces the potential for problems" (EY, How public blockchains are making private blockchains obsolete, 2019). Mutable ledgers suffer from the same fatal flaw that caused the demise of private intranets: a lack of interoperability.
2. Immutability As Virgil stated, "Evil is nourished and grows by concealment." Tyranny and crime are often aided by deletions.

Public immutable ledgers make such attacks uneconomical because attackers must now risk:

- 1) Significant Capital – to out-compete Transaction Processors with significant skin in the game in the form of data centres and network infrastructure; and 2) Prison – attacks are public and provide all with immutable evidence of bad actions, raising the risk of being caught compared to legacy cloud infrastructure attacks. Even if successful, compromises are smaller (one address, node, or account) because the architecture distributes value to the network's edges. Who will spend millions or more to publicly commit a crime for a relatively small reward?
3. Sybil resistance and self-healing: Improved security and resiliency through a near complete graph Risk of Sybil attack increases with the number of hops between nodes. Sybil resistance cannot be achieved with a network distance greater than 4 (On Bitcoin and Red Balloons, 2012). Bitcoin is Sybil resistant with around 1.32 hops between nodes (Transaction Processors) because it incentivises them to form a near complete graph and compete in accordance with the rule of law to secure the network (through block propagation). The result? The most secure, sybil resistant, and resilient self-healing network to date. 97% of Transaction Processors could fail and the system could still operate (Self-healing networks: redundancy and structure, 2014). AWS, Microsoft, and other cloud providers could not survive such an attack. Mutable ledgers on mesh networks remain vulnerable to sybils and can fail even in the absence of attacks, such as the Eurozone's Target2 and T2S payment systems which suffered a "major incident" on 23 October 2020 and was offline for 11 hours

(ECB, Communication on TARGET incident from 23/10/2020). 4. Guaranteed innovation and efficiency through competition The public immutable ledger guarantees continued innovation and efficiency by replacing the reliance on a single provider with an open market of Transaction Processors who must constantly compete and innovate to survive competition. By contrast, private centralised ledgers, private DLTs, and other Proof of Stake systems lack any inherent innovation incentive beyond the initial investment. Today, organisations manage this inefficiency through fixed contact terms before returning to the market with new tenders. Bitcoin takes this dynamic to its logical Schumpeterian end: an open transaction processing market organised by unilateral agreement. 5. Improved privacy via The New Privacy Model Public DLTs are just as private as traditional ledgers, using similar privacy tools such as encryption and obfuscation. However, the New Privacy Model further improves resiliency by disincentivising attacks (see 3. Sybil resistance). Operational or cyber risks that might be unavoidable include threats to ECDSA and political corruption undermining the rule of law and effective operations of courts. For further reading, see <https://nchain.com/why-public-blockchains-will-thrive/>.

#### *14. Should a CBDC be legal tender?*

Yes, a U.S. CBDC should indeed be legal tender because Section 31 U.S.C. 5103 defines United States coins and currency as such, and it would seem confusing and inconsistent for the digital to not be treated as legally equivalent to the physical form, from which it derives. A U.S. CBDC is effectively a digital version of existing and future Federal Reserve issued banknotes. Legal tender serves a beneficial and useful function in the economy and a CBDC will enable more inclusion and more participation in the economy thanks to micropayments, improved privacy and other factors as outlined elsewhere in our response. As the micropayment economy grows in coming years and decades, the public and private sectors will need to have a stable, reliable instrument that acts as legal tender and assists U.S. innovation. A U.S. CBDC is the obvious candidate. U.S. CBDC micropayments have the potential to power many innovations spanning the Internet of Things, 5G, identity management, supply-chain management, and more. Given the U.S. Dollar's international role, and the evolution of the United States constitution and its laws, it makes sense to have a modern, efficient, U.S. CBDC that can pay and settle debts to support the United States' future as well as many other jurisdictions who presently rely upon the U.S. Dollar for trade every day. If the United States and the Federal Reserve lead this space, the U.S. private and public sectors may enjoy many benefits and strategic advantages. A well-designed U.S. CBDC could allow U.S. entrepreneurs and private enterprises to innovate new solutions that interface with the CBDC, renewing economic growth and advancing the USA's innovative culture and legacy. The Federal Reserve will not need to provide these innovations itself but merely design a U.S. CBDC in such a way that maximises innovation and interoperability whilst ensuring compliance with the law. For recommendations on how to achieve this, see our response to Question 17 or contact us for further information.

#### *15. Should a CBDC pay interest? If so, why and how? If not, why not?*

CBDC should not, at least initially, pay interest because physical cash doesn't and this model is most likely to minimise cost and risk. With this approach, people can still loan their CBDC to banks or other parties who may pay them interest on it in the form of commercial bank money. And of course, any balances could be converted back to CBDC upon withdrawal. CBDC is programmatic and extensible. Therefore, a central bank can issue non-interest bearing CBDC with the option of converting it to interest bearing in the future should they wish to do so. CBDC based on digital cash represents the most prudent and cost-effective way of advancing CBDC whilst minimising risks to the existing system. Over time, more exotic models of CBDC that deviate from the legal foundation of cash can be experimented with. A non-interest bearing and more cash like CBDC, mimicking physical cash, seems less likely to generate any negative impacts to the existing financial sector whilst providing the greatest array of benefits because it allows for the delivery of major efficiency benefits without, it would seem, additional risks. If CBDC is issued on a public blockchain, it can also be the basis for non-debt lending (see [https://www.linkedin.com/pulse/non-debt-lending-wp-0091-craig-s-wright?trk=public\\_profile\\_a\\_rticl\\_e\\_view](https://www.linkedin.com/pulse/non-debt-lending-wp-0091-craig-s-wright?trk=public_profile_a_rticl_e_view)). This approach could provide an important alternative to the debt-based paradigm of today. For jurisdictions that wish to, CBDC can additionally support interest payments. This can be deployed by simply updating the CBDC Terms and Conditions, which can themselves be programmatic. An interest bearing CBDC can allow governments and central banks to explore new monetary and fiscal policy tools, such as outlined in our response to Question 1, see 3. Improved Monetary Policy and 4. Improved Fiscal Policy. This opens up a wide variety of possibilities. For example, interest could be paid to some groups and not others, though this may have implications with existing laws. Interest bearing CBDC on a public immutable ledger can also facilitate improved data collection and empirical analysis of novel monetary tools that might help address recent challenges to monetary theory (Lee, Werner,

Reconsidering Monetary Policy: An Empirical Examination of the Relationship Between Interest Rates and Nominal GDP Growth in the U.S., U.K., Germany and Japan, 2017).

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

CBDC, being digital cash, should not be subject to single end user quantity limits because physical cash is not. It has been argued that by limiting holdings, the financial sector might reduce the risk of bank runs (Reserve Bank of Australia, Retail Central Bank Digital Currency: Design Considerations, Rationales and Implications, 2020). However, as we have mentioned numerous times, if Werner is correct in concluding that the credit creation theory of banking is empirically supported and the intermediation theory is not (Werner, A lost century in economics: Three theories of banking and the conclusive evidence, 2016), then this risk of runs would appear to arise from possibly unnecessary and inappropriate reserve and capital adequacy requirements implemented on the assumption of the intermediation theory and in need of review. As the old proverb states, in the land of the blind, the one-eyed man is king. A second argument is that holding limits may be required to trigger KYC and AML requirements. But doesn't it make practical sense for these arise at the point of purchase? Where what is to be purchased demands compliance with KYC and AML? CBDC operating as programmable digital cash on a public immutable ledger capable of the New Privacy Model (Nakamoto 2008) can deliver this and provides states with the opportunity to return digital operations to the domain of the individual, rather than their exclusive dependence on trusted-third parties. As CBDC evolves, it remains critical to ensure that its potential is not crushed by the frictions of government overreach or private interests.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

Firstly, the Federal Reserve can issue digital cash without providing any accounts to the public. CBDC does not need to be 'intermediated' like electronic bank transfers because it need not be account based. As a bearer instrument, CBDC can enable peer-to-peer digital payments just like physical cash but with improved legal compliance and traceability. For e.g., Alice uses IP-to-IP, RFID, or another form of connectivity to send Bob a CBDC request to pay (payment template), which Bob signs and then broadcasts to the network for confirmation. Reintroducing and requiring intermediation back into the payment flow (for e.g., Alice instructs her intermediary to transfer funds from her account to Bob's account) is unnecessary and undermines resiliency, security, and efficiency. We therefore suggest abandoning the term "intermediaries" entirely for something more technically accurate, such as "suppliers" or "service providers". In our recommended design, The Hybrid Model (Direct and Intermediated Access) using a Private Permissioned CBDC on Public DLT, we identify 5 main types of firms or ecosystem participants and 2 key components with the following roles and regulatory structure. 1. The Central Bank Issuer: a. Issues an inherently programmable CBDC onto a single, core ledger (The Core Ledger). b. Defines the Terms of Service that are inherited automatically by any and all participants interacting with their issued CBDC. The CBDC itself is the API. c. Manages the CBDC in accordance with the Terms of Service. This may include actions associated with digital cash such as new issuances, freezing, thawing, and withdrawing CBDC funds, complying with court orders, managing policies, etc. 2. The CBDC Capabilities Provider: provides to the issuing central bank, CBDC capabilities and various overlay services that interface with the core ledger. This allows central banks to retain complete control over their private permissioned CBDC whilst enabling private enterprises to design and build innovative services on top of the Core Ledger to maximise the CBDC's functionality and innovation opportunities. 3. Users (individuals, citizens, households, and legal entities such as small businesses): a. Hold CBDC themselves with direct responsibility. As an electronic bearer instrument similar to cash, those who choose to hold CBDC themselves are responsible for securing and safeguarding their claim to their CBDC. Any loss or compromise is the responsibility of the individual. However, unlike physical cash, central banks may elect to allow (natively or via Payment Interface Providers) services for recovering lost funds. b. Make payments. c. Access additional services provided by Payment Interface Providers. 4. Payment Interface Providers: a. Can be automatically regulated entities who provide services that programmatically interact with the CBDC and therefore, the Terms & Conditions set by the issuing central bank. Layering networks over the Core Ledger to integrate with Payment Interface Providers allows the central bank to permission and manage who can interact with their CBDC, enabling improved visibility, security, efficiency, control and transparency over circulated money as the system scales. b. May provide a wide variety of services to users, including but not limited to: (i) Account management services — particularly in helping households and small businesses protect access to their CBDC. (ii) Digital identity services — ensuring KYC, AML, and CFT compliance. (iii) Payment services — particularly sending and receiving payments, bill payments, online payments, peer-to-peer, and offline payments services. (iv) Smart contract services — including templates, compilers, IDEs, networked services for management, procurement, dispute resolution, etc. (v) Tokenisation,

registry management, distribution, and secondary market services. (vi) Legal and dispute resolution services — notarisation, arbitration, and court integration services. (vii) Account reconciliation and automated audit services. (viii) Analytics and reporting services. 5. Transaction Processors: Compete publicly, risking significant capital investment, to write and store CBDC transactions into blocks and appended those blocks to The Core Ledger. These entities may be listed on public stock exchanges. Central Banks may operate (or tender for the provision of) additional Transaction Processors to provide further CBDC resilience for their jurisdiction beyond the network baseline. The 2 key components: 6. The CBDC: functions as public digital cash for the issuing Central Bank and is recorded in the Core Ledger. 7. The Core Ledger: provides a single, highly secure, available, resilient, fast, efficient, immutable, and interoperable digital ledger for recording private permissioned CBDC transactions at the cost of micropayments. This design ensures that only a single ledger exists to represent the status of all issued central bank money.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

What if the internet or any provider in today's digital payments chain (such an issuing bank or card scheme) goes offline? In many cases, trade stops. Yes, some exchanges may be saved by reverting to the redundancy of physical cash payments. But the root cause problem is clear: today's digital payments network is fragile to a single network outage in the payment chain. For e.g., the Royal Bank of Scotland (RBS) was fined £56m by regulators after a 2012 software issue left over 6.5 million customers unable to access accounts for over several weeks (BBC, RBS fined £56m over 'unacceptable' computer failure, BBC, 20 November 2014). In 2018, the TSB outage left 1.9 million without access to payments (BBC, TSB customers hit by online banking outage, 1 April 2020). Also in 2018, Visa suffered their first outage in over 7 years because of a failure in their authorisation service which had an estimated economic impact on retailers approximately £105m (Based on debit card spend of £530billion a year in the UK). In 2019, the Reserve Bank of Australia flagged 'concern' over bank outages, which are not improving. As society goes cashless, we are increasingly dependent on digital services that are fundamentally fragile. If the root cause issue is not addressed, we are highly likely to see further system outages in the future, affecting millions of people and resulting in the significant economic losses. CBDC can and should address this fragility by introducing a new, parallel and "offline" capable digital payment system. How? The best way, in our view, is to use our recommended design: The Hybrid Model (Direct and Intermediated Access) using a Private Permissioned CBDC on Public DLT because this empowers CBDC with breakthrough benefits, such as the New Privacy Model, Simplified Payment Verification (SPV), immutability, ~100% uptime, offline payments, micropayments and more (see Nakamoto, 2008), at the lowest cost and risk to the state and citizen (see our response to Question 17). Unlike traditional payment systems, where a merchant facing internet outages or disruptions to their acquirer or scheme must revert to cash or risk losing the sale, CBDC enables offline payments: the merchant can continue accepting payments with reasonable credit risk. When offline, merchants can still get paid with reasonable credit risk using the following payment flow: 1) The customer pays the merchant peer-to-peer; 2) The merchant validates the transaction using SPV; and 3) upon reconnection, the merchant broadcasts any unconfirmed transactions to the network. Merchants can further minimise risks of accepting offline payments by implementing transaction thresholds to only allow lower value payments. Merchants can do all this without the cost and inconvenience of operating a full network node and instead, by simply running a lightweight client that provides SPV validation logic. Techniques such as SPV also allow merchants and other parties to identify illicit transactions or attempted 'double-spend' attacks without storing or validating the entire public DLT but merely one or more block headers. And Transaction Processors can use alert key systems to signal the enforcement of court orders associated with freezing funds to all parties on the network.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

CBDC should not maximise ease of use nor acceptance at the point of sale at the cost of compromising other core features suggested by the BIS and ECB requirements (Central bank digital currencies: foundational principles and core features, 2020; Report on a digital euro, 2020). Fortunately, CBDC can maximise ease of use and acceptance at the point of sale, even during periods when merchants are offline, as we have discussed in Question 18, by developing CBDC as a private permissioned CBDC on public immutable ledger because this approach supports both direct and intermediated access and offers developers and the private sector the greatest potential for providing novel approaches that maximise ease of use and acceptance at the point of sale. CBDC need not be limited to one payment method or technology but can be extensible to include the widest variety of innovation and technologies via a flexible, Turing complete scripting language that allows for real-time compliance with U.S. laws (Wright, Turing Complete Bitcoin Script White Paper, 2018). This can allow the

competitive power of the private sector to continually innovate and maximise ease of use and acceptance at the point of sale. Many new techniques can improve the payment experience through wallet applications, smart phone, smart cards and internet of things devices. Fees should also be kept at minimum, which is best achieved through the open Transaction Processing market and industry resulting from the public immutable ledger (Nakamoto, 2008) which will drive down costs further as volumes scale. We believe fees of as little as one thousandth of a cent will be possible once a public blockchain in the original design proposed by Nakamoto scales. This reduction in cost compared to present bank, card and e-money payments can exponentially increase the point of sale to every device connected to the network. It's important to remember that CBDC on a public ledger helps expand the "point of sale" to new business models derived from micropayments – the ability send tiny amounts of digital cash. This capability enables new ways to pay for internet services. For example, purchase a secure webpage or piece of content on the internet for a fraction of a cent and without having to subscribe. Such tiny amounts, can, but need not be finalised immediately as the cost and trouble of attempting to double spend them is uneconomical. Finally, the United States should beware any providers or private interests seeking to maximise ease of use and acceptance at the point of sale, by implementing some method that obfuscates the base layer with a closed and innovation blocking architecture, such as that suggested by the Bank of England's discussion paper in 2020. To proceed with such a design would risk critically wounding any CBDC's chances at interoperability and wasting public funds.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

As the failed 'intranet' and private ledger money systems of the 1980s and 1990s demonstrate, centralised ledgers and private DLTs are fundamentally innovation blocking, adding cost, friction and barriers when compared to the more open and interoperable protocols that gained global dominance, such as TCP/IP. Today's interoperability and data portability exists largely because of fragmented and concentrated private payments markets built inside of TCP/IP – which itself did not include a native payments system. Central banks and governments seeking to avoid repeating the anti-innovation practices of history, should avoid private DLTs and centralised ledgers, and instead develop CBDC on a public and highly interoperable DLT that can open up a new era of innovation, consumer choice and data portability. Interoperability, openness to innovation, improved competition and transferability across multiple payment platforms, can be best achieved by issuing CBDC onto a public ledger that incorporates a Turing complete scripting language. This design approach guarantees interoperability at the base layer and avoids the innovation blocking consequences of alternative legacy architectures. With legacy architectures, interoperability is sacrificed for manual controls to enforce terms and conditions – often with cost, delays, and varying degrees of success. However, because CBDC on a public DLT or blockchain is inherently programmable, issuing central banks can automatically and frictionlessly gain complete control over their CBDC without the need for high barriers to entry and two-tier abstraction layers that add cost and block innovation. By providing a digital means to exchange value and data, CBDC can fundamentally improve the interoperability of business systems across all industries, allowing organisations and citizens to move between services more flexibly with less friction, increasing innovation and competition. CBDC can be implemented in a variety of ways, each of which can be objectively assessed. Choosing to build CBDC on private systems that do not operate on open public blockchains is possible, but ultimately inferior, compromising payments resilience, interoperability, efficiency, and transparency. Private permissioned ledgers running on mutable ledgers ultimately fail interoperability, though continue to be promoted by some of the same software vendors that successfully promoted and, in some cases, sold to governments for millions, failed 'intranet' systems of the 1980s and 1990s. Central bankers and states would be wise to avoid repeating the open vs closed (internet vs intranet) past lessons of interoperability when considering the appropriate infrastructure for their CBDCs. The conflict of interest that exists in legacy centralised and private DLT systems between ledger management and monetary governance also deserves reassessment in light of more recent innovative alternatives, specifically, public DLT. We recommend innovative central banks, governments and organisations prioritise CBDC efforts towards a private permissioned CBDC on a public immutable ledger because this approach:

- allows Central Banks to retain absolute control over their CBDC issuance and management as the private permissioned issuer of their own CBDC;
- offers unmatched price and speed efficiency;
- offers unmatched network resilience and uptime (including offline payments); and
- offers unmatched innovation opportunities – avoiding technology lock-in effects and empowering all users with access, whilst maintaining the Central Banks ability to control and govern users interacting with their CBDC tokens.

The core technical innovation of the public ledger infrastructure already exists well as some of the CBDC capabilities and overlay services. Additional work, research and focus is needed to advance these areas and ensure CBDC's consistent and predictable operation across all major use cases. In addition, international agreement of technical standards can streamline

adoption, cross-border payments, and other aspects of CBDC. For more design insights, also see our response to question 17 and please contact us if you would like to discuss.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Future and existing technological innovations could affect design and policy choices related to CBDC by influencing consumer, provider and regulator expectations and introducing new capabilities. Future technological innovations of interest to CBDC include the following.

1. The public immutable ledger (blockchain) The introduction of the public immutable ledger (Nakamoto 2008) affects design and policy choices relating to a CBDC because it fundamentally improves the ability to deliver CBDC in accordance with the BIS' requirements (BIS, Central Bank Digital Currencies: Foundational Principles and Core Features, October 2020) to a level higher than possible with legacy systems because it transcends legacy trade-offs. Before the invention of public immutable ledgers, it was considered acceptable to: a. compromise the system's efficiency and speed to achieve resilience; and b. compromise speed of settlement to achieve high transaction throughput. Following the introduction of the first public immutable ledger, these trade-offs should no longer be tolerated because development on top of a public immutable ledger (DLT) can eliminate them. For more information, see our response to Question 22 at point 2 Redundant Legacy Trade-offs. The public immutable ledger also extends the following capabilities and strategic benefits to a CBDC, expanding its potential for innovation and economic growth:
  - a highly scalable, immutable, resilient and secure ledger;
  - a triple entry accounting model that promotes privacy but not anonymity;
  - programmable, Turing complete money (Wright, Turing Complete Bitcoin Script White Paper, 2018) through a flexible scripting language (Script) enabling smart contracts, atomic swaps and the establishment of new data economies;
  - micropayments;
  - the ability to support true peer-to-peer payments; and
  - a design that allows for improved legal compliance and provides an immutable evidence trail.
2. Internet Protocol version 6 (IPv6) With CBDC payment channels and IPv6 jumbo blocks, the United States has a path to introduce U.S. citizens to an on-demand internet of value that can serve people on any income and anywhere in the world while protecting their privacy. These capabilities could significantly improve Dollar's international role. IPv6 solves many of IPv4 shortcomings including too few IP addresses and a lack of native security, thereby unlocking powerful new capabilities and new industry opportunities for the future. 'Secure network mobility' will allow user devices, or clients forming the edges of the network, to not give unauthorised access to sensitive information even when compromised. User locations will no longer present an attack surface or software vulnerability, enabling truly mobile cloud experiences that protect user privacy.
3. Quantum computing Quantum computing is not an issue (Wright, Bitcoin and Quantum Computing, 2018).

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

This BIS' three foundational principles of, "Do no harm", "Coexistence" and "Innovation and efficiency" and 14 core features mentioned in their 2020 paper, CBDC foundational principles and core features, are an excellent start. We also recommend the following.

1. Two additional design principles in the form of additional core features.
  - 1.1. Data integrity How can you trust that your CBDC data has integrity, is authentic and hasn't been tampered with? In Report on a digital euro (2020), the ECB pointed out the importance of this feature, albeit under the heading of 'cyber resilience', "Requirement 14 (R14): cyber resilience. Digital euro services will need to be highly resilient to cyber threats and capable of providing a high level of protection to the financial ecosystem from cyberattacks. In the event of successful attacks, the recovery time should be short, and the integrity of the data protected." Data integrity is critical to certificate issuance, governance, dispute resolution and other foundational services. A single attack on today's legacy digital systems can compromise the logs and data integrity of significant economic systems running on top. For e.g., in 2011 an attack on DigiNotar compromised the Dutch Government, Google and many others. CBDC systems lacking the requirement of 'data integrity' or a modern understanding of immutable ledgers are likely to deliver significantly inferior, more vulnerable and therefore more costly and inefficient CBDC

systems that undermine financial stability. Nakamoto's introduction of the world's first public immutable ledger in 2008, finally allows humanity to advance into a new era of data integrity. 1.2. Privacy A minimum standard of privacy is desirable and necessary for any CBDC design to encourage use and protect privacy rights enshrined in law. Privacy has become an increasingly significant issue as evidenced by legislation such as GDPR. The introduction of the New Privacy Model (Nakamoto 2008) along with micropayments and of atomic data field controls mean there is no longer a reasonable excuse for states to deny citizens sovereignty over their private information. The addition of these two core features, in combination with the other 14, are likely to improve the potential for maximising positive CBDC outcomes. The invention of the public immutable ledger (Nakamoto 2008) also has important consequences in achieving the potential benefits of CBDC because it eliminates conventional digital system trade-offs entirely, unlocking for powerful new opportunities for economic growth and innovation through new systems with significantly improved levels of security, privacy, efficiency, auditability, and so forth. Designers who fail to appreciate the implications of immutable ledgers for system design risk settling for what are now superfluous legacy trade-offs and suffer compromised results. For e.g., before the invention of public immutable ledgers, it was considered acceptable to: a. compromise the system's efficiency and speed to achieve resilience; and b. compromise speed of settlement to achieve high transaction throughput. For example, see Bank of England, 'Central Bank Digital Currency: Opportunities, Challenges and Design', Discussion Paper, 2020, page 43. Following the introduction of the first public immutable ledger in 2009, these trade-offs should no longer be tolerated because development on top of a public immutable ledger (DLT) can eliminate them. 2. Redundant Legacy Trade-offs 2.1. Transaction throughput versus speed of settlement – building a private permissioned CBDC on a public immutable ledger eliminates this trade-off because both throughput and settlement can be simplified to one step and achieved simultaneously. If users require settlement delays, such as for verification of high-value or real-world asset transactions, this can be embedded into the transaction agreement (or smart contract) itself so that settlement is not delayed by technological constraints but rather by business-imposed constraints, captured in the terms of an agreement. 2.2. Resilience versus efficiency – building a private permissioned CBDC on a public immutable ledger largely eliminates this trade-off because the resilience of the node infrastructure is no longer dependent on a single cloud operator or operating system. Instead, the central bank's CBDC can be securely and compliantly serviced by the entire global and open market of Transaction Processors. Meanwhile, having all participants operating on a single and immutable Core Ledger whilst maintaining integrity achieves efficiency above beyond that of the unsynchronised and mutable ledger of legacy systems. The significance of public immutable ledgers in negating the above legacy trade-offs should not be overlooked. CBDCs that utilise a public immutable ledger will achieve superior resilience, efficiency, scale, and speed compared to CBDCs that don't.

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*Name or Organization*

*Industry*

Technology Company

*Country*

United States of America

*State*

California

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

As a matter of policy, any CBDC developed by the United States must utilize facial verification for transacting in the CBDC. Please see the attached white paper: "THE CASE FOR FACE PAY IN CBDC SYSTEMS"

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

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*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

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*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

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Please see the attached white paper: "THE CASE FOR FACE PAY IN CBDC SYSTEMS"

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Please see the attached white paper: "THE CASE FOR FACE PAY IN CBDC SYSTEMS"

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

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*Name or Organization*

Emily

*Industry*

Individual

*Country*

United States of America

*State*

Arkansas

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

I cannot think of a single additional benefit that could be raised, considering there is not one benefit in this entire paper. The risks are many. Inability for those that have little access to digital technology or broadband wifi being unbanked, the government's ability to enforce "stimulus" through negative interest rates, and spending rations on whatever the establishment deems an unappealing market. Think about this as if you aren't the party in power.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

No, the "benefits" of a CBDC already exist in online banking. Current banking at least allows citizens that feel more comfortable with physical cash and checks to utilize those methods of payment as well.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Absolutely, and it would be a net negative. There is a population of people that will never bank online and will never trust applications like Venmo, etc. Even as a millennial, I don't use Apple pay and I don't swipe my credit cards over sensors as opposed to inserting the chip. Also, this will be used to exclude political opponents from the market. If not now, eventually.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

It would give them complete authority over the markets and basically usher in communism. The Federal Reserve was always supposed to be a separate administrative industry working in tandem with the government in our best interests. You may meet the goals of maximum employment and price stability...because we all would be expected to work, own nothing, and have only one option on the shelf for whatever we want to buy.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

There would be no financial stability because financial stability would be completely manufactured by the state. I would consider that a net negative effect seeing as I'm not an authoritarian.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

It would eliminate it entirely. The government already regulates the financial sector...it can't offer a "competing product" that would stand up against the financial sector. It will force everyone on to the CBDC with unrealistic introductory promo rates, annihilate the financial sector, and then once that's gone lock us in to whatever the government allows.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial*

sector? Would some of these tools diminish the potential benefits of a CBDC?

Do not create a CBDC. That's it.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

No, cash usage has already declined dramatically over the past decade. No one uses money because they care about a central bank, they use it because they need stuff. If you create a central currency, other methods of value exchange will emerge no matter how much you try to quash it.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

They won't. They'll just have more scrutiny (unless you're a billionaire off-shoring).

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

They shouldn't. Maybe focus more on the Petrodollar.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Yeah, I didn't see a section on Communistic, authoritarian, Orwellian (even though it's overused) concerns with this gross overreach. It would be nice to read those opinions as well.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

HAHAHA, this has to be a joke. Privacy without complete anonymity is an oxymoron.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

You're the government, you should know the answer to this one considering you have all of the agencies of defense at your disposal. I am a mere citizen.

*14. Should a CBDC be legal tender?*

Sure, as long as it's not required.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

Yes, because checking/savings accounts pay interest. Otherwise, it's the digital version of putting your money in your mattress but with the risk of the government taking it from you at any time.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

No, that's insane. But if you wanted to do that, they should be able to move their money to other accounts. I assume that's not where this question is leading, it seems like it's implying a wealth cap....so where would the excess funds go? The government, I assume?!

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

None, because there shouldn't be a CBDC.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

You'd need to have offline capabilities unless you just want to starve the poor out of society, but it's on you to figure out how that would be achieved.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

All products should maximize ease of use and acceptance at point of sale. Considering CBDC doesn't exist yet, I can't provide any constructive advice. Perhaps your experts would know this and not have to rely on the public.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

Ask Elon.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

If there is a CBDC, I don't anticipate many technological innovations or focus on design because we will live in a very bleak world.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

What I would ask you to consider is turning away from your need to control the people that you deem unworthy or incapable of making decisions for themselves and looking internally into your need to control others. Perhaps seek humility, absorb the beauty of nature, and come to terms with the fact that life here is finite and you'll never control it despite your strongest desire to do so.

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*Name or Organization*

The National ATM Council, Inc.

*Industry*

Trade Organization

*Country*

United States of America

*State*

Florida

*Email*

bruce@natmc.org

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

The Board is being appropriately careful and cautious in considering creation of a US CBDC. This is a step that once taken cannot easily if ever be retracted. As the world's leading fiat currency, such a step must of necessity require close examination before making a policy decision will decades long implications for our nation. It is also a very legitimate fundamental question to ask at the outset whether a US CBDC in fact makes sense in the real world marketplace and, given all the existing digital payment alternatives now in place, whether it will in fact bring added value to consumers, or instead wind up as an unnecessary "flop". Moreover, the structure and features that attach to the initial format/features of any potential US CBDC will likely be vital in the ultimate success or failure of a US CBDC. In addition to the risks and concerns already recognized in the Discussion Paper, NAC would point out two critical policy considerations associated with the notion of a US CBDC: 1. How will a US CBDC be "distributed" on the streets of America? Will there be a role for a physical ATM in a US CBDC world and what will that role look like?; and 2. How will the Board ensure no "discrimination" between traditional cash and a new potential US CBDC, along with a ready means for everyday US citizens to be able to convert back and forth in a reasonable way between traditional cash and the new US CBDC...and between a US CBDC and non-fiat cryptocurrencies for the foreseeable future? Beyond these issues, NAC is concerned that the "solutions" now on the table to address the fundamental privacy and "Big Brother" concerns associated with a US CBDC don't and won't actually address those concerns and that the privacy rights of US citizens will be greatly diminished in the process. While the Discussion Paper makes a nod to needing to "protect privacy", it also cuts way back on that commitment by including the need for a US CBDC transactions to be "ID Verified" in nature. Last, but of no less importance, it is a vital policy consideration for the Board to ensure that traditional cash remains strong and universally accepted as "legal tender" throughout the US - a position that has unfortunately already begun to be eroded. Allowing introduction of a US CBDC to result in the atrophy of traditional US currency would be a dereliction of the Board's fundamental charge, and would be a change that our nation and its people will greatly regret when the power is out, cellphone service was disconnected, or the Lord forbid - Russia were to use it's EMP weaponry to fry all our circuits - where a US CBDC won't do the trick to keep commerce going...even if that US CBDC is "offline". It is imperative for these and other reasons that creation of a US CBDC continue to be carefully scrutinized before a decision is made to proceed, and if this moves forward - the Board makes certain to keep traditional cash universally available, accepted for payment, and readily convertible to/from any form of US CBDC that may be implemented.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

Rather than introduce its own "product" the Board could conceivably choose to rely upon the marketplace to continue to deliver diverse and innovative digital purchase/payment products. In this approach, the role of the Fed would be to assure a level playing field and reasonable regulation for all players and applicable new markets. With that said, NAC understands and respects the need to assure that US currency maintains its role as the world's leading fiat currency - including in a world where digital fiat currencies are being introduced by other countries.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for*

*inclusion?*

Although a CBDC is often touted by its supporters as a vehicle to improve inclusion, this is in reality a very open question. One example of the problem is illustrated by the large percentages of mobile phone service suspensions/disconnections that are experienced by our lower socioeconomic/minority population related to an inability to pay for service. Without a working mobile phone &/or home internet service (a related problem) - a US CBDC isn't available. At least with cash/check/card, those all work without the requirement for an active mobile phone &/or internet service in place. NAC members' experience is that when the vast number of unbanked/underbanked citizens receive funds in the form of a prepaid card or the like, they will convert that to cash ASAP. It's much easier for citizens to get into financial "trouble" with spending over budget with digital payments made at the push of a button, versus the inherent self-budgeting assistance traditional cash provides to people on a fixed income/budget. There are instances of first-time low income digital users getting in trouble with debt they can't handle and never had an issue with when they were living on a cash basis. With these and other real world examples, it is accurate to say that the jury is still very much "out" on whether a US CBDC will actually help or hurt the economically disadvantaged in our nation.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

Unknown.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Unknown - but inherently risky - based on it being a departure from our tried and true current system without a US CBDC - and based upon the inherent risks associated with any cryptocurrency that don't exist in a traditional cash world.

*6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

The impacts are unknown and untested - and therefore quite risky. A US CBDC is unlike any other non-fiat cryptocurrency and the implications/impacts of a US CBDC can only be guessed.

*7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?*

It would seem that, if possible, some form of "pilot project" would be prudent to test/debug/refine the CBDC in a controlled/limited real world setting prior to any larger roll out. As NAC understands it, the more the Board tries to make a US CBDC look/act like the traditional US Dollar, the less innovative digital features will be able to be incorporated into the US CBDC product design. Proper resolution of this inherent tension will not be an easy tightrope to walk in thinking about a US CBDC.

*8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?*

Yes, this is of vital concern. It is a matter of national security, economic stability, and personal freedoms/privacy protection that we maintain a strong, universal, and fully functional traditional paper/coin currency medium/system for the foreseeable future. To do otherwise would be a dereliction of duty and a threat to our future national security and ongoing payments inclusion.

*9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?*

Private sector innovation and competition have been what we've looked to for this in the past - coordinated with a supportive and informed governmental policy framework and understanding of the marketplace dynamics in order to foster continued broad growth.

*10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?*

While we must remain mindful of and seek to learn from what other countries are doing regarding CBDCs, the U.S. should not let other countries or their actions dictate or unduly

influence our monetary policy/strategic goals here at home. As the world's leading economy/currency, we should be appropriately thoughtful and careful regarding the notion of introducing a US CBDC, and make sure that if we do it, we do it right.

*11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?*

Unknown.

*12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?*

No CBDC will offer the privacy and data protection aspects offered by traditional cash. Moreover, the temptation will be great for law enforcement, other governmental authorities, and perhaps those with political or other such private sector goals, to seek to obtain/misuse this information for their own purposes when the circumstances are right/so dictate. There is no such thing as being a little private when it comes to your personal spending/saving decisions. Either the information is private or it is not, and the only check and balance against this concern is to ensure that cash remains strong and universal as an alternative payment means of transacting business versus a CBDC.

*13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?*

Top IT security experts agree, no IT/data system is un-hackable. Hacks on banks are bad enough. Hacks on a US CBDC would appear to amplify these risks significantly.

*14. Should a CBDC be legal tender?*

It is unclear what the implications of this would be, since even cash as legal tender is no longer being universally accepted as a payment choice for consumers in the US. A US CBDC cannot and should not be sought to be fashioned as a substitute for traditional physical cash, for all the reasons stated in our responses and in the Discussion Paper itself.

*15. Should a CBDC pay interest? If so, why and how? If not, why not?*

It depends on all the other features/policy structure and goals applicable to the CBDC.

*16. Should the amount of CBDC held by a single end-user be subject to quantity limits?*

Again, it depends on the nature of the the CBDC and what features and policy goals it embodies.

*17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?*

There should be an attempt to avoid disruption of existing "rails" and modalities for handling and transacting in traditional cash - while utilizing the present infrastructure as the starting point for a distribution framework for the CBDC. Regulatory structures should protect consumers while relying on robust competition and marketplace forces wherever possible so as to promote innovation and cost effectiveness.

*18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?*

It is not at all clear how this would work and be workable in the real world. Certain forms of the existing cash system are "online" and others are "in hand". How that will translate for a CBDC is an open question we would need to learn more about.

*19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?*

It is unclear whether this is an appropriate role for a CBDC and would appear to be aimed at replacing traditional cash, cards, checks for this purpose, which would appear contradictory to the premises set forth in the Discussion Paper.

*20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?*

New tech and standards will need to be created for this to actually work in the real world.

Much study and further work will need to be done over a period of years to make this type of transition.

*21. How might future technological innovations affect design and policy choices related to CBDC?*

Again, a future risk looms that any US CBDC may be outstripped by changes in technology that do not lend themselves to ready adoption/change in a US CBDC ecosystem. The level of speculation involved in trying to answer this question is another instance of the inherent risk associated with this exercise.

*22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?*

As noted above, there is an inherent tension between trying to have a CBDC that is cash-like versus having a CBDC that is a robustly full featured form of digital currency. The US Dollar and a US Digital Dollar are two different animals and the Board's policy should acknowledge this reality and make certain that it keeps traditional cash/US currency solid and strong while it looks at introducing new US CBDC and during any transition that brings a US CBDC into play.

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*Name or Organization*

*Industry*

Technology Company

*Country*

United States of America

*State*

California

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

THE CASE FOR FACE PAY IN CBDC SYSTEMS Evan W. Grant John A. Miller Dimitar Dyankov M. A. Zaman DRAFT May 20, 2022 THE CASE FOR FACE PAY IN CBDC SYSTEMS I. Introduction Over the next ten years, the use of physical cash in many countries around the world will decline—and may be altogether eliminated. The reason? Phasing out cash in favor of digital payments brings with it a bevy of benefits, reducing tax fraud, creating more efficient economies, and combatting illegal activities such as terrorism and money laundering. To that end, many countries around the world are developing a Central Bank Digital Currency (CBDC) for retail transactions, with one of the primary stated aims being to provide greater financial tools and access to the unbanked. Yet, in almost all cases, the CBDC systems being designed, tested, and implemented have significant barriers to usage. These barriers include a properly functioning smartphone, loaded with a specially designed app, and a reliable internet connection to both scan a QR code at the point of sale and transmit the data to complete the transaction. Unfortunately, these barriers will prove insurmountable for the same people the CBDC system is designed to serve—as a significant percentage will not have smartphones or internet access, much less both. Additionally, each year tens of millions of smartphones are lost, stolen, stop working, or are unavailable. Indeed, one of the greatest risks for countries and their policymakers during the inevitable shift away from cash to digital currencies is that the most vulnerable in the population will be most dependent on—yet least likely to have—functional smart mobile devices with internet connection to purchase food, water, and other basic necessities on a daily basis. To solve this problem, governments designing, testing, or issuing a CBDC should include another mechanism—beyond the phone—for authenticating CBDC transactions. We propose that as a matter of policy, Central Banks around the world should implement facial verification as an alternative to phone based verification. Face verification has been shown to be a safe, reliable, and scalable way for payments to be made in brick-and-mortar locations. II. Overview of CBDCs CBDCs are issued by the central bank of a country for public use as legal tender and are basically digital versions of an existing national currency. But “instead of holding it in your wallet, you store it on your phone.” A CBDC differs from the balance shown in a checking account of a traditional bank (electronically or on paper) in that a bank balance is a liability of the bank. CBDCs are distinct from cryptocurrencies, (e.g., Bitcoin and Ethereum) and stablecoins (e.g. USDT and USDC), which are created by non-governmental issuers and generally are decentralized and utilize distributed ledger technology (e.g. blockchain). Cryptos are backed exclusively by trust in the issuer. In contrast, stablecoins are digital assets designed to maintain a stable value in relation to a designated benchmark (e.g. a fiat currency and gold), the most common of which is the US Dollar. To maintain the relative value to the designated benchmark, stablecoins are backed by other asset reserves and are generally redeemable at any time for an equal amount of the designated benchmark currency (e.g., 5 stablecoins pegged to the US Dollar can be traded for \$5 USD).

Government around the world are racing to develop and issue their own CBDC. Globally, nine out of every ten countries—accounting for over ninety percent of global GDP—are considering issuing a retail CBDC. As of May 2022, more than one-in-four central banks have launched a CBDC or are in advanced pilots. Doubling the number from 2021, 26 percent of central banks are “currently developing a CBDC or running a pilot,” and another 62 percent of central banks “are conducting experiments or proofs-of-concept.” And over two thirds believe they are likely or might issue a CBDC in the short or medium term.

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

A. CBDC Examples 1. The Bahamas The Bahamian CBDC (the Sand Dollar) was officially launched in October 2020. In late 2021, there were approximately 20,000 active Sand Dollar wallets in a population of about 400,000, and functions are continuously being developed. As of late 2021, there was only \$300,000 Sand Dollars in circulation, but this represented nearly a four-fold increase from 2021. The Sand Dollar is largely dependent on the use of a smartphone with internet access. There is technically an option, although seldom used, to use a card like device to make purchases. However, use of the card still requires the merchant to use a smartphone to scan a QR code shown on the card. In addition, to use the card, a second factor authentication is required based on a code generated and shown on the card. In order to generate and display the code, the card needs sufficient battery power. The card can also be lost, stolen or otherwise not work like a smartphone. In addition, there is a significant portion of the Bahamian population that remains without a both a smartphone and reliable internet connection. 2. Nigeria Nigeria launched the eNaira in October 2021. By January 2022, 694,000 eNaira wallets had been downloaded, resulting in \$450,000 worth of transactions. The eNaira platform is dependent on smartphones with internet access to function. In addition, “[d]espite the [Central Bank’s] stated goal of using the digital currency to boost financial inclusion in Nigeria,” the inability of users to prove their identity is “effectively excluding millions of unbanked citizens from using” Nigeria’s CBDC. Even if the eNaira is ultimately expanded to everyone with a mobile phone, approximately 10% of the population does not have one. 3. Eastern Caribbean In March 2021, the Eastern Caribbean Central Bank, the monetary authority for the members of the Organization of Eastern Caribbean States, launched DCash, an electronic version of the Eastern Caribbean dollar. DCash is dependent on a smartphone scanning the merchant’s QR code to complete a transaction. About 4,000 people and 280 businesses have signed up for DCash. Through mid-February, the ECCB minted about \$850,000 USD worth of DCash. 4. China China completed the development of a retail CBDC in 2019 and began pilots through its mobile app at that time. These pilots have expanded over the last two years to hundreds of millions of people and millions of businesses. Based on the most recent numbers released by the Chinese government, at the end of 2021, the number of individual digital yuan users swelled to 261 million, a more than 12-fold increase since the end of June 2021. And as of October 2021, 10 million businesses had digital yuan wallets. In the second half of 2021, there was 53.1 billion digital yuan of transactions. The digital yuan is also dependent on smart-devices.

III. Problems with Phone Dependent CBDC Systems There are several reasons why policy makers should not be reliant on smartphones for CBDC payment. First, not everyone has a smartphone. More than 16% of the global population—around 1.3 billion people —do not own a smartphone. And 1.1 billion people (approximately 14 % of the global population) are unable to use a smartphone even if they had one because they do not have access to electricity to charge the phone. Even in the top 10 developed countries (e.g. USA, UK, UAE, France, Spain, and Canada), on average, approximately 26.5% of the population does not have a smartphone. In contrast, in the top developing countries (e.g. India, Nigeria, Indonesia, and Pakistan) on average around 74.6% of the population does not have a smartphone. Based on the most recent available data, the United States has the highest percentage of smartphone users, with 82.2% (273.76 million), and China had the highest number of users due to its population with 953.55 million (66%). This means 58.84 million Americans (17.7%), and 456.45 million Chinese (32.3%) don’t have a smartphone. In addition, the most vulnerable groups are also the groups with the least smartphone users. For example, despite the United States having the highest penetration of smartphones at 82.2%, only 46% of those over 65+, 43% of those with less than a high school education, and 33% of those earning less than \$30,000 per year, have a smartphone.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

Second, even when people have smartphones, many do not have internet access. In developing economies, 60% of adults did not have both a mobile phone and internet. “In developing countries, there is a six point gender gap with only 37 percent of women having both a mobile phone and access to the internet.” And there is a 20 point gap between the richest 60% and the poorest 40%. Even in advanced economies, such as the United States, around 7% don’t use the internet, mainly the elderly and the undereducated. And for the global unbanked population, upwards of 75% “don’t have internet access, even if they have a mobile phone.” Third, even for people who have smartphones and internet access, the smartphone is not always available—it can be stolen, lost, damaged, malfunction, run out of charge, or left in another location. For example, as of 2016, approximately 70 million smartphones are lost each year in the US alone. That number has likely increased every year since. Id. “So regardless of the exact figure, lost smartphones will account for a significant percentage of annual mobile sales in the US, as they do in the UK and likely elsewhere.” Id. Approximately 10% of Americans have their smartphones stolen and this percentage “is bound to keep growing.” There are other causes of unavailability, such as the battery failing, or simply running out of charge, the phone

malfunctioning, or being submerged in water. Fourth, even when someone has an available, functioning smart phone, with reliable internet access, the current designs of CBDC use Quick Response (QR) codes to authenticate the transaction. But using QR codes for payment is “inherently risky” and “comes with a whole host of issues” including that the QR codes “can be easily stolen, replaced, or manipulated for nefarious purposes.” The problems with QR codes for payment are so big that the United States FBI recently warned Americans that “cybercriminals are taking advantage of this technology by directing QR code scans to malicious sites to steal victim data, embedding malware to gain access to the victim’s device, and redirecting payment for cybercriminal use.” China has shown using QR codes for payment creates “an environment ripe for rampant fraud,” because scammers can “very easily” create QR codes and implant viruses, and “consumers cannot verify the authenticity of QR codes by eye.” “One common way to scam unsuspecting victims is to replace a legitimate code with a bad one,” which installs a Trojan or virus on the phone. For example, in 2017 in China, “over 23 per cent of Trojans and viruses [were] transmitted via QR codes.” Another common scam is to “surreptitiously photograph[]” someone’s phone screen “showing [their] personal QR code” and use the photo to spend money from the account. “The security of QR codes has long been an issue,” such that at one point China had banned QR code based payments from mobile devices. Although China ultimately allowed such transactions, it imposed a daily transaction cap per customer that is generally \$150 USD. Near-field communications (NFC) technology is not the answer for CBDCs because it still requires a smartphone that not everyone has. And there are security concerns with this technology including eavesdropping, data corruption or modification, interception attacks, and physical thefts. And there “are growing concerns about the security and safety of private stored information when carrying out NFC-based mobile transactions.” NFC may be more secure than a magnetic strip credit card, but even the NFC organization acknowledges “[n]o amount of encryption can protect a consumer from a stolen phone,” and “[i]f a smartphone is stolen, the thief could theoretically wave the phone over a card reader at a store to make a purchase.” Finally, the use of NFC technology is subject to whom of the phone manufacture, including their ability to extract additional fees or only allowing their own payment app to access the chip.

**IV. Problems with Card Dependent CBDC Systems** Policy makers should not design card reliant CBDC systems either. Magnetic strip cards, chip cards, or “cold storage devices” as a secondary authentication method suffer many of the problems shown with smartphones and QR codes, such as prone to being lost, stolen, destroyed, malfunction, or otherwise unavailable when they are needed. They are also prone to fraud. Credit and debit card fraud “is an unfortunate fact of life,” which is on the rise following the Covid pandemic, which impacts a huge number of victims each year. For example, about ½ of US adults have had a fraudulent charge made to their account and more than 1/3 of card holders have been the victim of fraud more than once. In addition, cards have additional drawbacks because they are expensive and require extensive time and resources to manufacture, ship, manage, and replace.

#### *4. How might a U.S. CBDC affect the Federal Reserve’s ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

**V. The Case for Face Verification as an Alternative to Smartphone Verification** To address the shortcomings of phone- and card-based authentication platforms, policymakers designing and implementing CBDC systems should consider face verification technologies as a component of their solution. Contactless payments are now widely preferred due to the coronavirus pandemic, and as a result “facial recognition payments are taking off” and “likely to be a popular addition” to other forms of contactless payment. With face authentication, “there is no need to carry a smartphone, bank card, or any form of identification, or even have to enter a pin number.” In 2020, there were 671 million users globally of software-based facial recognition technology used to secure payments. A 2021 Juniper Research study predicts there will be more than 1.4 billion users globally by 2025. Face pay is most widely used in China, where in 2019 approximately “1,000 convenience stores installed a facial payment method and more than 100 million Chinese have registered to use the technology.” In 2021, more than 495 million Chinese—about 1/3 of the population—made payments authenticated by their face. And it is predicted that in 2022 there will be more than 760 million in China using face pay. While everyone acknowledges privacy concerns that must be mitigated, experts explain that face authentication for payments and other services “is inevitable for safety and security.” As China has shown, even when consumers have “serious doubts” regarding security of their information, “the convenience of this payment method has made people willing to use it.” And despite the privacy concerns, there is an ever-increasing number of public and private entities that are relying on facial verification because it is the most accurate, reliable and secure method to authenticate identity. In the United States, PopID has implemented its face pay platform, PopPay, across business surrounding college campuses. PopPay has robust security features including a three-dimensional liveness check. The platform allows consumers to “check in” to an ordering or shopping process using face verification and “check out” using face verification. Consumers can link any payment they choose to their PopPay account, and businesses can offer PopPay in any medium, including self-ordering kiosks, at the point of sale on the counter, in drive through systems, in table service order taking and payment products, and in web sites and mobile apps. PopPay provides various operational benefits to restaurant and

retail operators, and consumers generally have shown to prefer PopPay over card- and phone-based payment systems. The platform has been demonstrated to be accurate and more secure than other forms of payment authentication. In late 2021, PopID launched in Japan through a joint venture with a SoftBank subsidiary and recently announced the launch of the platform in the Middle East through a partnership with Visa and Dubai Holding. VI. Case Study: PopPay and the Bahamian Sand Dollar. In May 2022, PopID partnered with SunCash, the largest digital payments, mobile money, and e-commerce service provider in The Bahamas, to allow consumers to use the PopPay face verification platform to purchase goods and services with the Bahamian Sand Dollar. This is the first time in history that facial verification was used to transact in a fully launched CBDC. SunCash is one of seven authorized financial intuitions licensed by the Central Bank of The Bahamas to offer a digital Sand Dollar wallet. Through the partnership, SunCash's users can enroll in PopPay so they have the ability to spend their digital Bahamian dollars at a network of SunCash merchants. Various brands are or will be accepting digital Sand Dollars authenticated through PopPay, including local and global brands. The deployment of PopPay was applauded and commended by the Central Bank of The Bahamas. The Governor of the Central Bank of the Bahamas, John A. Rolle, recognized that PopPay's face pay platform provides "security features [that] are important to increasing personal comfort around the use of digital payments and advancing the Central Bank's goal of increasing financial inclusion among all segments of our society." VII. CONCLUSION CBDC systems that are reliant on smartphones run the very risk they are supposed to help alleviate—that the unbanked and underprivileged may not have the resources to participate in the new wave of digital transactions. The right phone, the right app, the right internet, and the right resources to fund, charge, and participate may be unavailable. In contrast, facial recognition payment technologies, like PopID's PopPay, promise to help address that problem. For any Central Bank considering a digital currency project, facial recognition verification should be an integral part of the final product—assisting all with the convenience, safety, and security.

5. *How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

See responses 1-4 which contain our white paper: THE CASE FOR FACE PAY IN CBDC SYSTEMS

6. *Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?*

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*Name or Organization*

E G I™ Euphrates Gallery Inc

*Industry*

Other: Cross-Cultural Cross-Discipline Applied Curatorial rD Cultural Education Content +  
Aud Diversity

*Country*

United States of America

*State*

Missouri

*Email*

*1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?*

CBDC + nCOVID-19 EraCommerce Drives Governance is not a rhetorical expression. Since 1440 'Oppressive Commerce' has served as an 'Atlantic Basin Business Module' until 2020 George Floyd's death brought into focus faceted sets of socio-cultural, socioeconomic, gender, racial, political maleficence which included a pervasive systemic institutionalize legacy of chattel slavery George Floyd's death, 25 May 2020, stratified a declaration of a new Coronavirus 19 Pandemic, 11 March 2020. Circa 12 Mayan estimate of '15 million deaths' worldwide were reported to have died directly or indirectly from the virus 24 Feb 2022 the world observed the invasion of Ukraine in horrific disbelief. Circa 17 May 2022 processed observation data from 2017 of Sagittarius A\* the black hole at the center of the Milky Way. '300 astronomers, and hundreds of engineers and support staff from 60 institutions across 20 countries and regions, processed [observation data].' On a shared human sojourn we are confronted with an uncommon wave after wave of challenges and opportunity. Central Bank Digital Currency is an atypical opportunity of significant ESG Value [Environmental, Social, Governance (Value)] if fashioned, developed and refined as a local global nPARADIGMS rD™ Creative Problem Solving Design tool. Quantum Computing would be a natural fit for the development of Central Bank Digital Currency as a cross cultural, cross discipline Curatorial rD™ nascent PARADIGMS™ Emanuél Cooper Jr E G I EAC™ 20 05 2022 ©

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*Name or Organization*

Fredrick odhiambo

*Industry*

Trade Organization

*Country*

Kenya

*State*

*Email*

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please help me only \$50000 you can though Western Union money

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want business

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\$50000

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please help me

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you can send email

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yes

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*Name or Organization*

Albert Marko

*Industry*

Individual

*Country*

United States of America

*State*

Florida

*Email*

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Being that most of your leadership are political appointees, where will they go for work when the banks they usually get hired from are cut down significantly with a Fed account for individuals?

*2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?*

You already have "digital dollars" via debit cards, credit cards, etc etc.

*3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?*

CBDC would obliterate the bottom line for Financial institutions. You won't have jobs to rely on after Fed time is up.

*4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?*

It wil help implement monetary policy but based on political agendas. Thats why you ejected the hawkish members for more liberal ones. Nice trick.

*5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?*

Negative financial stability as it is going to lead to MMT.

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