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## **Monetary policy implementation frameworks and the payment system**

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### **1. Summary**

One of the evaluation criteria for judging alternative long-run monetary policy implementation frameworks is the effect on the nation's payment system objectives, notably efficiency and resiliency. We consider in this note how alternative frameworks compare in this regard, assessing likely effects against the definitions of a safe and efficient payment system described by the Board in its Payment System Risk (PSR) policy. From a historical payments perspective, perhaps the most relevant high-level design consideration in assessing the implications of a monetary policy implementation framework for payment systems is the level of total reserve balances that would typically be maintained by depository institutions (DIs). Higher levels of reserve balances, all other things equal, can incentivize settlement earlier in the day. Earlier settlement not only supports both the efficiency and resiliency objectives but also reduces the amount of intraday credit needed for settlement, and hence the credit risk faced by the Federal Reserve. That said, tools other than high reserve balances are available to support earlier settlement as well as other aspects of a safe and efficient payment system.

In particular, the Federal Reserve has implemented a range of changes to its PSR policy which provide additional tools that should enable it to meet its payment system objectives across a wide range of frameworks, including those that would likely result in DIs holding lesser amounts of reserves than they do currently. Should, for instance, policymakers want to implement monetary policy with a significantly lower level of reserves than in place today, the revised PSR policy (adopted in 2008 and implemented in 2011) incorporates provisions that limit credit risk to the Federal Reserve and support earlier payment settlement than would have been the case previous to the adoption of the PSR policy in its current form. Overall, payment policy issues are unlikely to be of first order importance for the choice of a monetary policy framework in the coming period.

## 2. Background

The Federal Reserve has a goal of facilitating a safe and efficient payment system, as first defined in 1988 in its PSR policy. Safety is defined as 1) low direct credit risk to the Federal Reserve and the private sector, 2) low systemic risk, and 3) rapid final payments. Efficiency is defined as 1) low operating expense of making payments, 2) equitable treatment of all service providers and users in the payment system, 3) effective tools for implementing monetary policy, and 4) low transaction costs in the Treasury security market.

The Federal Reserve has been particularly concerned when banks delay making payments until the end of the processing day. Earlier payments result in a more efficient movement of funds and further the smooth functioning and timely completion of settlements, which are goals of the PSR policy.<sup>1</sup> Earlier payments also reduce operational risk for DIs, as they have more time to react to a payment not being received as expected, and for the Federal Reserve.<sup>2</sup>

Payment delay can occur when banks lack liquidity. To understand why, note that DIs routinely make numerous payments each day out of their Federal Reserve accounts, which hold funds for reserve maintenance and payments processing purposes.<sup>3</sup> In order for the payment system to function smoothly, DIs need sufficient intraday liquidity to process such payments. Fedwire, the Fed-operated and widely used wholesale payment processing system, is a real-time gross settlement system and, thus, requires sufficient immediate liquidity for a payment to settle. DIs have three sources of liquidity: the reserve balances they currently hold in their Federal Reserve accounts, incoming payments from other DIs which add reserves to the receiving DI's Federal Reserve account, and intraday credit from the Fed. Indeed, the Federal Reserve allows most accountholders to temporarily hold a negative balance ("extension of intraday credit") in their Federal Reserve accounts during the day. Though it may expose the Federal Reserve

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<sup>1</sup> *Federal Reserve Policy on Payment System Risk Part 2*

<sup>2</sup> The ability of the Federal Reserve to extend the Fedwire operating day mitigates against this risk.

<sup>3</sup> *The Evolution of the Federal Reserve's Intraday Credit Policies*, Stacy Coleman

to credit risk, the provision of intraday credit is one way that the Federal Reserve can promote a safe and efficient payment system across a range of operating regimes.

DIs are likely to use the least costly way to obtain the liquidity they need to support their payments activity. Pre-crisis, in part because the Federal Reserve did not remunerate reserves, banks aimed to hold as few reserves as they could in their Federal Reserve accounts, while still satisfying their reserve requirements, and thus were more likely to overdraft their accounts if they didn't delay payments. For that reason, the provision of intraday credit at a modest cost was an important policy tool to reduce DIs' incentive to delay settling their payments.

The Federal Reserve's PSR policy incorporates a set of flexible tools, such as daylight overdraft limits, collateralization incentives (which may conceivably in the future become requirements), overdraft fees, and account controls, to govern intraday credit extensions in a manner which both supports payment system liquidity and limits the central bank's credit risk exposure. In 2008, the Board changed its approach to explicitly recognize the role of intraday credit as a tool to promote payments efficiency as opposed to discouraging its use. The new policy is intended to support early settlements, even when these require intraday credit, by charging no fee for collateralized daylight overdrafts and offering a fee waiver for small, irregular overdrafts. This policy results in minimal cost of daylight overdrafts to DIs because of the low opportunity cost of collateral accepted against overdrafts.<sup>4</sup> This, in turn, promotes the smooth functioning of the payment system by encouraging rapid payments and also limits central bank credit risk by encouraging collateralization.<sup>5</sup> Because the changes were not implemented until 2011, when reserves were abundant, the effectiveness of the policy changes is not directly observable.

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<sup>4</sup> A wide range of collateral is acceptable for daylight overdrafts. Any securities or loan collateral acceptable for discount window purposes is also acceptable for overdrafts. The Federal Reserve's acceptance of bank loans, in particular, as collateral keeps the opportunity cost very low.

<sup>5</sup> *Federal Reserve Policy on Payment System Risk Part 2*

### **3. Impact of the Level of Reserve Balances on Payments Behavior**

The level of reserves available to DIs has historically influenced both the timing of their payments and the need to use intraday credit from the Federal Reserve. Empirical and theoretical research has shown that when the amount of reserves is low, as was the case pre-crisis, banks will delay payments if intraday credit is costly.<sup>6</sup> Indeed, when the level of reserves is low and daylight overdrafts have a cost, banks have an incentive to delay non-urgent payments until they can settle these payments without incurring a daylight overdraft. Some payments cannot be delayed, though, and banks will incur overdrafts to settle them. Research has also shown that banks borrow from the central bank to a greater extent when the amount of reserves is low.

With higher reserve levels, intraday credit is needed less and payments move earlier. Indeed, the effects of higher reserve levels on payments outcomes have been observed in the United States since the crisis. As reserve balances increased from \$20 billion in 2007 to \$2.8 trillion in 2014, there has been a trend to earlier payments and a reduction in daylight overdrafts. As shown in Chart 1, average overdrafts fell from a peak of over \$200 billion to less than \$10 billion. In a sense, the buffer of much higher levels of total reserves replaced the buffer provided by daylight overdrafts, reducing the credit risk to the Fed.<sup>7</sup> Similarly, as shown in Chart 2, in 2015, 45 percent of funds transfer value was sent by noon, a significant increase from the 17 percent sent in 2007.<sup>8</sup> It is important to note, however, that despite the abundant level of reserves, a substantial portion of payments still occur in the afternoon, partly because not all payments are known until later in the day; for example, DTC and CHIPS final settlement obligations are computed in the late afternoon. So, while earlier settlement is generally desirable, no operating framework can avoid late-day settlements completely. Finally, the magnitude of the

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<sup>6</sup> *Settlement Liquidity and Monetary Policy Implementation – Lessons From the Financial Crisis*, Bech, Martin, and McAndrews

<sup>7</sup> The extent of credit risk reduction may be small. Even in the pre-crisis era when overdrafts were more prevalent and not explicitly collateralized, the credit risk to the Federal Reserve was mitigated by collateral commonly pledged by banks for discount window purposes that may have been seized if needed to cover overdrafts.

<sup>8</sup> Excluding CHIPS and DTC payments

benefits of lessened credit risk to the Federal Reserve and earlier funds transfers is uncertain.

Research also provides evidence from foreign countries that operating regimes with abundant reserves are beneficial for the payment system. The Reserve Bank of New Zealand (RNBZ) is probably the most cited example. RNBZ switched to a floor system for implementing monetary policy in 2006. It subsequently stopped providing intraday credit and instead offered sufficient reserve balances based on institutions' liquidity needs.<sup>9</sup> The abundant reserves regime freed up payments, enabling the system to function more smoothly.

The data also suggest that there are diminishing marginal returns ("returns" defined here as earlier-in-the-day aggregate timing of payments and lower overdrafts) of higher levels of reserve balances. In Charts 1 and 2, one can observe the limited additional reduction in daylight overdrafts and limited increase in the percent of payments sent before noon after total reserves exceeds approximately \$1.5 trillion, respectively. The effects from the initial expansion in reserves, on the other hand, are much more noticeable.

#### **4. Conclusion**

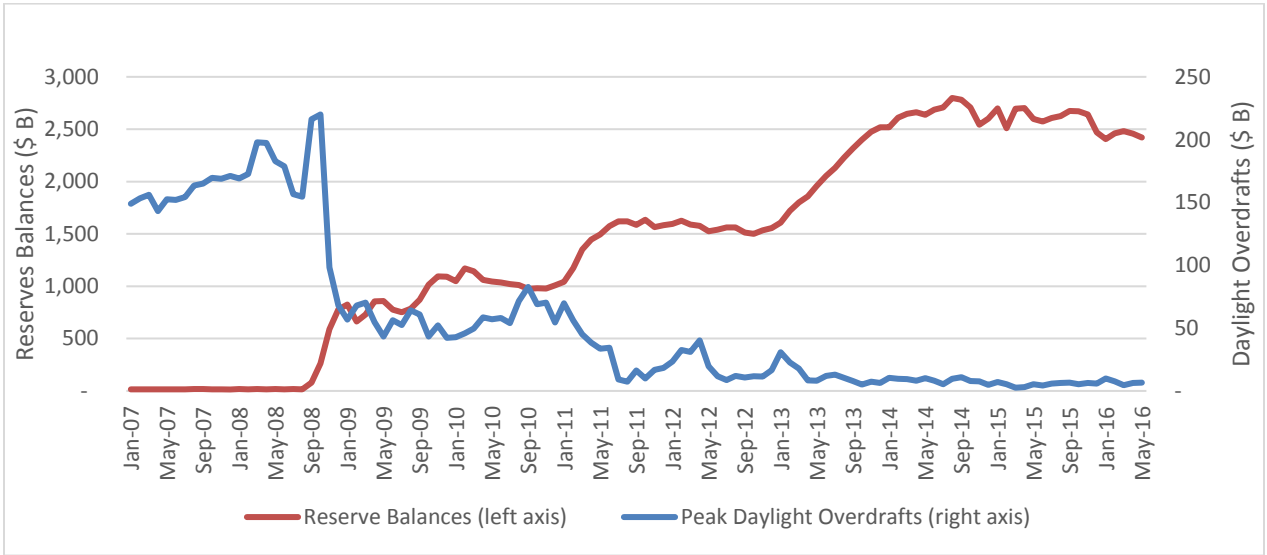
Some observations related to payments may be noteworthy when considering changes to the management of the Federal Reserve's balance sheet. For example, the data suggest that a gradual reduction in reserves would have only a modest effect on the level of daylight overdrafts and timing of payments throughout the day. After the level of reserves falls below a certain level (perhaps approximately \$1.5 trillion), however, we might expect to see a more meaningful increase in overdrafts. Undesirable effects such as increased payment delays, however, should be mitigated by the recent PSR policy changes if those changes work as intended.

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<sup>9</sup> This change was implemented to address the local scarcity of collateral that prevented access to intraday credit and created payment gridlock in New Zealand's RTGS system.

Overall, payment system considerations are likely to be secondary ones. In general, higher levels of reserves support more payment system efficiency, but the magnitude of the benefit is uncertain, particularly under the current PSR policy.

**Chart 1: Daylight Overdrafts Compared to Reserve Balances (\$ B)**



**Chart 2: Payment Timing and Reserve Balances**

