

**Meeting of the Federal Open Market Committee on
March 19–20, 2013**

A meeting of the Federal Open Market Committee was held in the offices of the Board of Governors of the Federal Reserve System in Washington, D.C., on Tuesday, March 19, 2013, at 10:00 a.m., and continued on Wednesday, March 20, 2013, at 9:00 a.m. Those present were the following:

Ben Bernanke, Chairman
William C. Dudley, Vice Chairman
James Bullard
Elizabeth Duke
Charles L. Evans
Esther L. George
Jerome H. Powell
Sarah Bloom Raskin
Eric Rosengren
Jeremy C. Stein
Daniel K. Tarullo
Janet L. Yellen

Christine Cumming, Richard W. Fisher, Narayana Kocherlakota, Sandra Pianalto, and Charles I. Plosser, Alternate Members of the Federal Open Market Committee

Jeffrey M. Lacker, Dennis P. Lockhart, and John C. Williams, Presidents of the Federal Reserve Banks of Richmond, Atlanta, and San Francisco, respectively

William B. English, Secretary and Economist
Deborah J. Danker, Deputy Secretary
Matthew M. Luecke, Assistant Secretary
David W. Skidmore, Assistant Secretary
Michelle A. Smith, Assistant Secretary
Scott G. Alvarez, General Counsel
Thomas C. Baxter, Deputy General Counsel
Steven B. Kamin, Economist
David W. Wilcox, Economist

Thomas A. Connors, Troy Davig, Michael P. Leahy, Stephen A. Meyer, David Reifschneider, Christopher J. Waller, and William Wascher, Associate Economists

Simon Potter, Manager, System Open Market Account

Michael S. Gibson, Director, Division of Banking Supervision and Regulation, Board of Governors

Nellie Liang, Director, Office of Financial Stability Policy and Research, Board of Governors

James A. Clouse and William Nelson, Deputy Directors, Division of Monetary Affairs, Board of Governors

Jon W. Faust, Special Adviser to the Board, Office of Board Members, Board of Governors

Linda Robertson, Assistant to the Board, Office of Board Members, Board of Governors

Seth B. Carpenter, Senior Associate Director, Division of Monetary Affairs, Board of Governors

Ellen M. Meade, Senior Adviser, Division of Monetary Affairs, Board of Governors

Eric M. Engen, Thomas Laubach, David E. Lebow, and Michael G. Palumbo, Associate Directors, Division of Research and Statistics, Board of Governors

William F. Bassett, Deputy Associate Director, Division of Monetary Affairs, Board of Governors

Stacey Tevlin, Assistant Director, Division of Research and Statistics, Board of Governors; Min Wei, Assistant Director, Division of Monetary Affairs, Board of Governors

Jeremy B. Rudd, Adviser, Division of Research and Statistics, Board of Governors

David H. Small, Project Manager, Division of Monetary Affairs, Board of Governors

Gregory L. Stefani, First Vice President, Federal Reserve Bank of Cleveland

David Altig, Loretta J. Mester, Glenn D. Rudebusch, and Mark S. Sniderman, Executive Vice Presidents, Federal Reserve Banks of Atlanta, Philadelphia, San Francisco, and Cleveland, respectively

Spencer Krane, Lorie K. Logan, Kevin Stiroh, and Kei-Mu Yi, Senior Vice Presidents, Federal Reserve Banks of Chicago, New York, New York, and Minneapolis, respectively

Evan F. Koenig, Jonathan P. McCarthy, Giovanni Olivei, and Julie Ann Rémache,¹ Vice Presidents, Federal Reserve Banks of Dallas, New York, Boston, and New York, respectively

Robert L. Hetzel, Senior Economist, Federal Reserve Bank of Richmond

¹ Attended Tuesday's session only.

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March 19 Session

CHAIRMAN BERNANKE. Good morning, everybody. I'd like to begin the meeting with a few comments on the leak investigation that Scott Alvarez and Bill English undertook. As you know, they sent a summary of their findings to you by SDS yesterday morning. The short summary of the summary is that, while they did an extensive investigation—they reached out to about 300 people, did dozens of interviews, listened to tapes, examined notes, and so on—they did not identify a gross example of intentional leaking. Instead, there seemed to be some examples of carelessness, but also some examples of very good practice, and some people who clearly followed the right procedure.

I've had several discussions with Scott and Bill about the details of their findings, and as far as the investigation is concerned, I don't think it's going to be fruitful to put more resources into it at this point. That said, I think Bill and Scott did learn quite a bit about interview practices, about interactions with the media in both formal and informal settings. And, in particular, they have a terrific case study of how, again, a good reporter, by talking literally to dozens of people and using various kinds of approaches, can put together information that no single individual would admit to or think that they had provided.

So, based on those insights, Scott and Bill included in the memo they sent you yesterday some pretty straightforward recommendations about improving our practices and our training. What I'd like to suggest is that we take those on advisement at this point as voluntary recommendations and as recommendations we could adopt. I would suggest that you take a look at them. If you have any concerns about them, please let me know. If you think we ought to elevate them to formal policy, which would take action by Janet's subcommittee and by the

FOMC, you should let me know that as well. I don't think that we need to have an extensive discussion today, but surely those recommendations are on the table at this point. Although we sent you a summary, more information is available. If you'd like to know more about the investigation, if you have specific questions or concerns, please feel free to talk to Bill or Scott. Let me say one other thing. Thank you to Bill and Scott for the tremendous amount of work they did. It took them quite a long time, and, as you know, they do have a few other things to worry about. So we appreciate their serious and determined efforts. Questions for me or for Scott and Bill? Governor Raskin.

MS. RASKIN. Thank you, Mr. Chairman. I, too, want to commend our FOMC secretary and FOMC general counsel for conducting their review. I very much appreciate the diligence that they brought to the task and the seriousness of purpose. I did note in the review that they provided to us that there really was no explicit reference to the Program for Security of FOMC Information, which is, as I understand it, our touchstone. This is where our rules on confidentiality are embedded. I guess it makes sense that we have these rules embedded, because, obviously, we conduct our deliberations here with a particular privilege of confidentiality, and we value those deliberations and the ability to deliberate in the way we do. I want to really underscore the importance of this Program for Security because it permits us to, in essence, enforce our own rules. We have set out rules for when we have potential unauthorized disclosures like we may have had in this last incident. So, because I value—I think we all value—our ability to conduct deliberations the way we do, I am glad that we have this policy. And with that privilege in mind, I guess I wanted to ask, as a point of process, both Bill and Scott whether, when they conducted their review, they conformed the review to the processes set forth in the Program for Security of FOMC Information.

MR. ENGLISH. I believe we did. The program asks that we conduct a review and then confer with the Chairman, which is the process that we followed. Scott, do you want to say anything further?

MR. ALVAREZ. So, that's exactly right. We did look beyond just the release of confidential information to compliance with the policy itself, which imposes some extra discipline on participants and staff.

MS. RASKIN. Thank you. Yes, I noticed that what the policy says is that "the Secretary and the FOMC's General Counsel will perform an initial review of the incident." That was what you did, the "initial review of the incident, in consultation with the Chairman," which occurred, "and with the President of a specific Federal Reserve Bank if the violation appears to have involved staff within that Bank." So that is what this is. I go on to read, "In light of that initial review, the General Counsel will determine whether to request the Board's Inspector General to perform a full investigation of the incident." Was that piece followed as well?

MR. ALVAREZ. Sure. We provided a very extensive report to the Chairman explaining all of the review that we did, much more detailed than the summary that has been provided to the Committee. Bill and I have discussed whether further investigation is appropriate or whether this matter should be referred to the IG. My recommendation was that it not be formally recommended to the IG, because I think the review that we did uncovered as much as could be uncovered. The IG does not have special tools that would allow them to get more information than we were able to get. And given that most of the information in this case was the result of phone calls and interviews and not a records-based kind of process, we thought that we were able to conduct about as extensive and detailed a review as possible. So that was the basis for my recommendation. The Chairman has to make a decision about whether there's disciplinary

action that should be taken here at the Board or by the presidents at the Reserve Banks. That's a separate matter. But that is my view.

CHAIRMAN BERNANKE. Governor Tarullo.

MR. TARULLO. Thank you, Mr. Chairman. This, as you said, is not the place to have a discussion of the substantive recommendations, but I do have some concerns about some of the substantive recommendations, mostly springing from what I think might be a quite de facto differential application of them to people without personal staffs as opposed to people who do have personal staffs, which is a bit of a presidents/Governors distinction. And so maybe there could be some forum or opportunity for an elaboration of some of those comments, whether in Janet's subcommittee or elsewhere.

CHAIRMAN BERNANKE. Well, Michelle has agreed to work with Bill and Scott in implementing this, and perhaps they can address the specific questions that you have. I guess I don't think we're ready to have a determination here, but if the general sense of the Committee is that we'd like to refer these recommendations to Janet's subcommittee and if Janet is willing, then over the next few meetings, we can fine-tune them and incorporate them into the policy. You don't seem happy, Governor.

MR. TARULLO. No, I'm not, but that's okay.

CHAIRMAN BERNANKE. I guess I don't understand the issue.

MR. TARULLO. Well, I was trying to avoid being too explicit about it—

CHAIRMAN BERNANKE. Ah, you were successful.

MR. TARULLO. —but I guess I'll get explicit about it. The issue is that, in short, when one is dealing with the press or a member of Congress or anybody outside the organization and one is staffed, the question becomes, who is the staff responsible to, and who are they supposed

to be helping out? And with the structure we've got at the Board, we have a kind of collective staff. A member of the Board of Governors does not have someone who is responsible for his or her position, in some sense, but also is interested in helping that individual communicate effectively his or her views, as opposed to the collective views of the Board. It puts the collective staff in an awkward position because they have multiple loyalties, and I just think it's something that needs to be thought through a little bit in this context. That was really the basis for my observation.

I assume it's fine for John or Charlie or someone. They've got a staff who will keep them on the straight and narrow, on the one hand, but also they can have fair assurance that there aren't divided interests that somebody has to serve and that just put the staff in an awkward position.

CHAIRMAN BERNANKE. Okay. We'll follow through on that. Thank you. Other questions or comments? [No response] All right. Seeing none, why don't we turn to the formal agenda? Item 1, "Financial Developments and Open Market Operations." And let me turn the floor over to Simon.

MR. POTTER.¹ Thank you, Mr. Chairman. Over the intermeeting period, investors noted a firming of economic data and perceived few signs that payroll tax increases have led to a pullback in spending thus far. There is little evidence in asset prices of expectations of a reduction in domestic monetary policy accommodation, possibly as investors await information on the sequestration's impact on growth, and in fact, some estimates of the timing of liftoff in the target fed funds rate have shifted out. Meanwhile, expectations for additional easing by the Bank of England and Bank of Japan have increased. Advanced-economy equities rose, domestic credit markets continued to experience strong demand, and the dollar appreciated broadly. With stable policy expectations, Treasury yields were little changed, on net, though primary and secondary mortgage rates rose.

It should be noted that while this briefing covers developments through last Friday, over the weekend, an agreement between Cyprus and the troika culminated in a €10 billion aid package that also included a planned imposition of a one-time

¹ The materials used by Mr. Potter and Ms. Logan are appended to this transcript (appendix 1).

stability levy on bank deposits. The unprecedented nature of this action and the delay in its implementation have created uncertainty and confusion but a relatively muted response in major financial markets to date. Steve Kamin will discuss developments in Cyprus in more detail later.

Exhibit 1 begins with a review of broad trends in advanced-economy asset markets. As seen in the upper-left panel, equity markets continued to advance, supported by expectations that monetary policy will remain highly accommodative. Equity gains in Japan were particularly notable, with the Nikkei up over 15 percent in local currency terms over the period. Meanwhile, in the United States, the S&P 500 index rose 3.5 percent and is just shy of its 2007 peak. Somewhat stronger-than-expected economic data also supported U.S. equities and risk assets more broadly, as did Fed communications that, on balance, were seen as reinforcing expectations for asset purchases to continue through year-end.

As seen in the first column of the upper-right panel, continued gains in domestic equities were accompanied by dollar appreciation. Dollar appreciation was driven in part by more significant shifts in policy expectations abroad. The divergent policy outlook is reflected by moves in interest rate differentials, as seen in the right-hand column. As for dollar strength against the euro, the outlook for ECB policy has not shifted materially, but euro-area data have been softer than in the United States, and German sovereign bonds have also benefited from modest flight-to-quality flows given political uncertainty in Italy.

Looking more closely at the broader U.S. fixed-income market, MBS spreads to Treasuries widened to levels last seen just prior to the introduction of purchases last September. Mortgage investors are particularly sensitive to improving economic data given extension risk on their mortgage holdings should Treasury yields and primary mortgage rates rise further. As seen in the middle-left panel, despite the rise in the secondary mortgage rate, the primary mortgage and jumbo conforming rates have been more stable, implying a narrowing of the spread between primary and secondary rates.

Accommodative monetary policy and firming growth expectations continued to support demand for a broad range of credit instruments, including corporate bonds, consumer ABS, and CLOs. Given low nominal yields on these instruments, investors increasingly note attractive equity valuations relative to credit valuations. As seen in the middle-right panel, the yield on the high-yield bond index fell to a new low over the cycle and is now below the earnings yield on the S&P 500 index. Should the growth outlook strengthen further, higher corporate earnings expectations could increase the attractiveness of equity investments relative to corporate credit at current yield levels. There is little evidence of a shift from fixed-income to equity investments thus far from institutional and retail investors. As shown in the lower-left panel, flows into equity funds have picked up this year, but this appears to have resulted largely from a drawdown of cash investments, as flows into taxable bond funds have remained fairly steady.

The bottom-right panel reviews individual large bank equity performance around the Fed's annual stress-test exercise. The process did not lead to a particularly notable market reaction despite prior market concerns of possibly higher volatility during the one-week interval between the release of the stress-test results and the assessments of banks' capital plans. Citigroup shares outperformed on the release of the DFAST results, as the firm showed large increases in its post-stress capital ratios from last year. Overall, the results were interpreted as evidence that supervisors are closely scrutinizing both the qualitative and quantitative aspects of the capital planning process.

Your second exhibit takes a closer look at policy expectations and developments both here and abroad.

Turning to the Fed's ongoing asset purchase program, according to the most recent primary dealer survey, dealers' expectations for the ultimate size of cumulative purchases appear to be coalescing at just over \$1 trillion as their expectations for the form of curtailment of the program and exit evolve.

In the most recent survey, we attempted to assess how expectations for asset purchases would vary with different possible outcomes for the labor market. Some of the results of this exercise are shown in the upper-left panel. We asked dealers for their distribution of expectations for the level of the SOMA portfolio at the end of 2014, conditional on three unemployment rate scenarios at the end of 2013. The first was a "favorable" outcome of lower than 7.4 percent unemployment, the second a "normal" outcome consistent with the December SEP's central tendency, and the third an "adverse" outcome of higher than 7.7 percent unemployment. From the resulting probability distributions, we make a number of observations. First, probability assessments for the ultimate size of the balance sheet vary with economic outcomes in a consistent and intuitive manner. Higher unemployment levels in 2013 are expected to result in a larger balance sheet at the end of 2014. Second, even conditional on the favorable economic outcome of an unemployment rate below 7.4 percent at the end of 2013, dealers, on average, assign less than a 1 in 5 probability that total purchases since the start of 2013 will be below \$540 billion, implying an even smaller chance that purchases at the current pace end by June or earlier. Third, comparing across the full set of the three conditional distributions (not shown), there is some evidence that dealers assess that the marginal costs relative to marginal benefits of balance sheet expansion do not increase markedly at higher levels of the SOMA portfolio.

Combining the results of a number of survey questions indicates that more dealers expect adjustments to the pace of purchases going forward. As seen in the upper-right panel, 19 dealers now expect a downward pace adjustment, compared with 15 in the prior survey. However, among dealers that do expect slowing, the median expectation is for the pace of purchases to remain constant until the fourth quarter. Interestingly, we are seeing some increase in the number of dealers that are expecting multiple adjustments to the pace of Treasury or MBS purchases over their estimated life of the program.

Investors have also been attuned to communications indicating that the June 2011 exit principles may be adjusted in light of changes in the size and composition of the SOMA portfolio. As seen in the middle-left panel, in the August 2011 survey, dealer expectations for MBS sales were largely in line with what was communicated in the exit principles—that is, sales commencing sometime after the first increase in the target federal funds rate. However, beginning with the MEP and continuing through the introduction of additional asset purchases last September, investors and dealers increasingly discussed the possibility that the principles would be revised. Responses to the January survey revealed that an increasing proportion of dealers had pushed out the timing of MBS sales beyond two quarters or did not expect sales at all. In the latest survey, we've seen a further increase in the proportion of dealers that expect MBS sales to occur at much later horizons, and over 50 percent of respondents now see no MBS sales as the most likely outcome.

Looking at policy expectations abroad, investors have increasingly focused on prospects for significant fiscal and monetary policy easing in Japan following the LDP's return to power. More recently, investor attention has shifted from fiscal stimulus and possible foreign exchange rate intervention to the possibility of longer-duration asset purchases by the BOJ. These expectations have intensified since the nomination and confirmation of new BOJ leadership known to be supportive of such measures. With expectations that purchases could target longer-duration government securities, yields on such securities have declined notably, as seen in the middle-right panel. Longer-dated Japanese sovereign bonds are believed to be owned predominantly by insurers and pension funds with a structural need for long-duration assets, implying that the Bank of Japan might have to pay a significant premium to acquire longer-term bonds.

These increased expectations for very aggressive policy, combined with the recent adoption of a 2 percent inflation target, have led to a notable increase in inflation expectations in Japan. Your lower-left panel shows the fixed-rate leg of 10-year inflation swaps for Japan and other advanced economies. In an inflation swap, one party exchanges fixed payments for floating payments tied to an inflation rate for a given period of time. While this is not a very liquid market, changes in the fixed rate tend to move in line with other market-based and survey measures of expected inflation. In the case of Japan, inflation swap rates have risen approximately 65 basis points as expectations for more-aggressive policy have increased since last fall and the yen has weakened. Looking past a technical issue related to the calculation of the retail price index, U.K. inflation swap rates have also increased along with expectations for additional easing. In addition, the Bank of England's most recent quarterly *Inflation Report* noted that inflation could remain above 2 percent for three years, which many have interpreted as a greater willingness by the MPC to tolerate upside deviations from its target. In contrast, inflation expectations in the United States and the euro-area have been much more stable.

In Europe, the positive effects of the OMT backstop and progress on fiscal and structural reforms can perhaps be seen in the relatively contained market reaction to Italy's inconclusive election. Although the election outcome risks putting the

country's long-term reform agenda on hold for at least several months, the widening of Italy's sovereign debt spreads to Germany has been relatively modest. And as seen in the bottom-right panel, spillover to other peripheral markets, such as Spain, has been quite limited, and recent Spanish sovereign debt auctions continue to meet with strong demand. In addition, access to funding markets continues to improve for peripheral European banks, as evidenced by continued reduction in reliance on ECB liquidity facilities. Since late January, when the ECB first began accepting early repayments on three-year LTRO loans, banks have repaid roughly €235 billion of the €1 trillion borrowed.

Your third exhibit shifts to U.S. domestic money markets and developments in the foreign SOMA portfolio.

As seen in the upper-left panel, federal funds trading volumes have been declining since late 2008, when excess reserves increased significantly. Since that time, lending in the federal funds market has been dominated by the government-sponsored enterprises, as they are unable to earn interest on reserve balances. In August 2011, Fannie Mae and Freddie Mac stopped most lending in unsecured markets, reflecting increased credit concerns in the midst of the European sovereign debt and banking crisis, leaving the Federal Home Loan Banks as the primary lenders.

Given the declining volumes, we have recently checked the robustness of our methodology for calculating the fed funds effective rate, which relies on data from fed funds brokers. As the FHLBs remain the predominant lenders in the market, we collected and analyzed confidential fed funds transaction data from those 12 institutions over a 10-week period and compared FHLB data with transaction data from the brokers. Our analysis shows that the characteristics of the published fed funds data collected from the brokers are very close to the data provided by the FHLBs. The main difference is caused by transactions in the broker data that take place at rates above 25 basis points—that is, interbank trades where one bank in the transaction is caught short of cash at the end of the day and needs to borrow unexpectedly. When brokered trades at 25 basis points and above are excluded from the broker data, the weighted-average rate of the data set used to calculate the effective fed funds rate is essentially the same as in the FHLB data set.

I would now like to update you on a number of developments in the foreign reserves portfolios of SOMA and the U.S. Treasury's Exchange Stabilization Fund. Recall that after some euro repo rates turned negative in the summer, the Desk shifted funds into unremunerated cash accounts at official institutions, as shown in the upper-right panel. As repo rates have recently increased to positive levels, the Desk has reallocated 15 percent of its euro reserves back to repo.

Under SOMA investment guidelines, the sovereign debts of six European countries are eligible collateral for euro-denominated repo investments. Starting on April 1, we will limit repo trading to French and German sovereign debt collateral. This will align the sovereign exposure in repo investments with that of the outright portfolio, in which we hold only French and German sovereign debt. We will

publicly maintain the eligibility of the other four countries but do not plan to transact repos backed by their obligations.

The staff has also reviewed the euro portfolio's outright holdings of French and German sovereign debt. Recall that outright sovereign investments are limited to 60 percent in one sovereign. In recent years, the portfolio's holdings of French debt have been persistently close to this limit since the Desk conducts purchases on a relative-value basis, and French securities have traded at higher yields. The Desk has rebalanced the portfolio's outright holdings since October, and as shown in the bottom two rows of the table, the allocation to French and German debt is now essentially balanced. The Desk intends to maintain this equal allocation going forward, as we will assess relative value separately for each country.

Lastly, given policy developments in Japan, the staff has begun to analyze the impact that a very low, or even negative, interest rate environment could have on our yen portfolio. As shown in the rightmost column, two-thirds of the yen portfolio is held in short-term Japanese government bonds. Liquidity in this market has deteriorated in recent months, reflecting the BOJ's current asset purchase program. Depending on the BOJ's strategy for purchases going forward, liquidity may be impaired further. The staff will consider options for the portfolio should the Desk face increasingly adverse market conditions and consult U.S. Treasury officials if shifts in the investment strategy may be warranted, and will update the Committee on any recommended changes. Lorie Logan will now update you on domestic operations and market functioning.

MS. LOGAN. Thank you, Simon. As shown in the upper-left panel of your next exhibit, the Desk has purchased \$277 billion and \$449 billion of longer-term Treasury and agency MBS, respectively, since September. Those purchases bring the share of SOMA holdings as a percent of longer-term Treasury and TBA-eligible MBS debt outstanding to 35 percent and 31 percent, respectively. Were additional purchases to be conducted, as expected by the median respondent in the primary dealer survey, we project those ownership shares to grow to 41 percent and 42 percent, respectively, by early 2014.

In the following panels, I will summarize the findings in the memo on the effects of asset purchases on market functioning. The memo presented measures that reflect trading activity, market depth, settlement efficiency, and concentration. Currently, these measures seem to be largely in line with conditions prevailing before September and are also generally in line with longer-run ranges.

The upper-right panel indicates that trading volumes for both Treasury and MBS remain near to slightly above the average seen since September and are in line with longer-run ranges. A meaningful drop in trading activity could signal that market participants are pulling back from the market because of higher transaction costs or a reduction in liquidity.

As seen in the middle-left panel, the four-week moving average of the bid–asked spread observed for the most recently issued 10-year Treasury security, as shown in the dark-blue line, has remained stable. Similarly, as shown in the light-blue line, the four-week moving average of the indicative bid–asked spread in a widely produced MBS coupon has fluctuated since September but shows no trend toward wider bid–asked spreads.

In the middle-right panel, we show that the four-week moving average of the daily level of delivery failures in the Treasury market remains near September levels and the level of MBS delivery failures has declined since September. These measures suggest that settlement in the market is not being meaningfully affected by the Desk’s purchases.

As shown in the bottom-left panel, market concentration among the primary dealers in their trading activity is in line with levels seen last September and in prior years. If more of the trading was being conducted by a smaller set of dealers, it might indicate that some participants are allocating less capital to trading in these markets or perhaps signal the potential for deterioration in the market infrastructure supporting such activity.

Measures specific to the Desk’s operations can also provide some direct insight into market conditions. The bottom-right panel shows that the offer-to-cover ratio in our Treasury operations has increased since the start of the year. This partially reflects the increase in the frequency of our operations in the absence of the MEP sales, a change that allowed us to decrease the size of each operation.

Turning to the upper-left panel of the last exhibit, we show the weighted-average difference between the accepted price and the next-best price in the Desk’s MBS purchases. This indicator has changed little since September. We read these indicators as suggesting that there have been no significant changes in the competitiveness of Desk operations. Deterioration in these measures could be one indication of less willingness to take risk or participate in these markets more generally.

In addition, the primary dealer survey asked dealers to compare current functioning for longer-term Treasury and MBS with the best and worst conditions since the beginning of 2009 and to rate current market functioning relative to last September. As shown in the upper-right panel, the majority of dealers noted that market conditions in both markets are better than the average conditions prevailing over the period since the beginning of 2009. Nearly all of the dealers rate market functioning for the longer-term Treasury market as the same since September, while dealers were more split in regard to the overall MBS market.

With little evidence of a deterioration in market functioning or in the Desk’s operations to date, the staff assessed whether such deterioration is likely in the future, updating work distributed to the Committee in 2012. Overall, the staff concludes that purchases of Treasury and MBS at the current pace through the end of the year would

be feasible without causing significant adverse effects on market functioning, based on estimates of future issuance and the existing stock of securities available for ready purchase. In fact, with respect to Treasury securities, we estimate that the monthly pace could be sustained at an even higher level through the end of 2013, although, depending on the size of any potential increase, a reduction in the average duration of securities purchases might be required.

The assessment for MBS is more complicated. The Desk's purchases are made in the TBA market in production coupons, which are the most liquid segments of the MBS market and most closely tied to the primary mortgage rate. As a proxy for the amount of these MBS available for purchase, we estimate both the amount of gross TBA issuance expected over the purchase horizon and the existing stock in the production coupons. Newly issued MBS are generally the most liquid source for purchase but are not a purchase limit, because many existing securities are also efficiently delivered into TBA purchases.

As seen in the dark-blue bars of the last panel, purchases at the current pace are expected to reach the total amount of gross TBA issuance in May and remain close to issuance through the end of the year. Given the sensitivity to interest rates of refinancing activity and thus issuance projections, the staff also considered the effects of an instantaneous 50 basis point upward shock to the path of long-term interest rates in the baseline. The results are shown in the light-blue bars. This scenario would require the Desk to purchase about \$100 billion more MBS than are expected to be issued between May and the end of the year.

Prior purchase experience suggests that market-functioning risks rise as purchases exceed gross issuance and a greater amount of the existing stock is purchased. However, there is approximately \$600 billion in production coupon TBA-eligible securities that could potentially be delivered into the Desk's TBA purchases. The existence of this supply should help mitigate the impact of purchases on market functioning under the baseline and the shock scenarios. In addition, our issuance projections are somewhat conservative since we assume that there's no net growth in the MBS market.

On balance, Treasury and MBS markets have functioned somewhat better than anticipated by the staff in September. Indeed, across a range of indicators presented, both markets appear to be functioning well. Staff estimates suggest that MBS purchases at the current pace through the end of the year remain feasible without a significant adverse effect on market functioning. However, the risks in the MBS market are likely to rise in the second half of the year, particularly if rates increase sharply. The staff will continue to monitor market liquidity and functioning and the performance of Desk operations and report any notable developments. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you very much. I note that we decided to put the market-functioning presentation here at this point, but obviously it bears on the discussion we'll

have later on efficacy and costs. Are there questions for Simon or Lorie? No questions?

President Kocherlakota.

MR. KOCHERLAKOTA. Yes. Thank you, Mr. Chairman. I had a comment and a question. My comment is that I think I had asked for depictions of covariance, and panel 7 on exhibit 2 is very nice along those lines. Thanks.

MR. POTTER. We thought of it ourselves. Remember, it's without policymaker input.

MR. KOCHERLAKOTA. Oh—good. I'm glad to hear that. That would have been a disaster if it had been with my input. Let me ask a question that may be better put off to later in the day. When we look at market function, it's an input into something else, I guess. Maybe it's too philosophical a question, but why are we concerned about market function? I as a policymaker don't really care particularly how well the mortgage-backed security market functions. It's more as an input into something else, and what is that something else? Is it about pass-through of these policies into other rates?

MS. LOGAN. I think there are two large themes that we've been thinking about when looking at the market functioning measures. The first is, just for your information, to think about how the operations are actually performing and make sure we can continue at the current pace without having temporary flow effects on market pricing that affect our execution. On the larger question, I think we look at the broader measures to see if liquidity or market functioning is being impacted and affecting risk premiums, which may offset some of the policy impact of the lower term premium in the program. So if we were to see much wider bid-asked spreads or lower volumes and risk premiums were to rise, it could partially offset the policy. In addition, in terms of the pass-through to other rates, the Treasury market is the most active market for

hedging, and thus if it becomes more expensive to hedge, it could have an impact on the prices in other private credit markets.

MR. KOCHERLAKOTA. Yes, I was just putting myself in the hypothetical situation of, if we were to change the pace of purchases and I was asked to explain it, I think it would be challenging if I had to say that it was because a bid–asked spread got wider. So it’s going to be useful for me to go further than that.

MR. POTTER. If it’s not passing through to the primary mortgage rate in the right way, it’s not the most efficient way. I think that’s the easiest way to explain it. And then the Treasury market is very important for funding for the U.S. Treasury as well. So we wouldn’t want to produce distortions in that.

MR. KOCHERLAKOTA. Okay. Thank you. That’s very helpful.

CHAIRMAN BERNANKE. President Fisher.

MR. FISHER. On this point, of course, the pass-through we’ve had has basically been one for one, if memory serves, in terms of the impact on mortgage rates. Roughly.

MR. POTTER. Close to. Two-thirds to three-quarters.

MR. FISHER. Right. And of course, you want to keep testing that.

MR. POTTER. Yes.

MR. FISHER. But it’s important, too, in thinking through market functioning, to think ahead about the sell side as well and about what we can learn as we go through the purchase cycle—what signals we might pick up there. That’s where, President Kocherlakota, it does become of interest because it’s a question of what kind of reaction we might have, and that conditions our exit strategy or our holding strategy or whatever we decide to do—perhaps our paring strategy.

I wanted to take this opportunity, Mr. Chairman, and I don't know if we're going to get a chance to discuss it further, but I want to thank Simon for his good memo on interest rate sensitivity of the SOMA portfolio. I'd asked a lot of questions about that before, and I wanted to thank Simon and the Desk for what I thought was a very good report, constantly illuminating, and quite educational. So I wanted to go on record and thank you for that.

MR. POTTER. Well, Bill and his team helped.

MR. FISHER. I want to thank Bill as well.

CHAIRMAN BERNANKE. Okay. Thank you. Any other questions? [No response] Okay. Seeing none, let's turn to the economic and financial situation, and I'll call on David Wilcox to lead off a series of presentations. Oh, I'm sorry. Debbie, as always, has to remind me that we need a vote to ratify domestic open market operations since the January meeting. Any objections? [No response] Seeing none, we approve those operations, and now we'll turn to David Wilcox.

MR. WILCOX.² Thank you, Mr. Chairman. I'll be referring to a single-page exhibit called "Forecast Summary." Recognizing the risk that the meeting today and tomorrow will go down in history as the FOMC meeting that ran longer than a papal conclave, I shall be uncharacteristically brief.

As you know, our latest forecast is little revised from the one that we presented in January, reflecting incoming data that generally met or exceeded our expectations, but a fiscal policy at the federal level that looks set to be more restrictive than we had assumed.

Turning first to the labor market, the two employment reports that we received over the intermeeting period portray a labor market that's improving at a pace similar to or perhaps a little faster than we had anticipated in January. On the household side, the unemployment rate last month was 7.7 percent, in line with our January forecast. On the establishment side, nonfarm payroll growth is currently estimated to have averaged 190,000 jobs per month over the three months ending in February, about 35,000 more than our January projection. After taking into account the portion of the benchmark revision to the establishment survey that was a surprise to us, the level of

² The materials used by Mr. Wilcox are appended to this transcript (appendix 2).

nonfarm payroll employment in February is now estimated to be 330,000 above the level we had expected at the time of the January Tealbook.

In response to the incoming data, we've nudged up the pace of monthly payroll job gains by 20,000 over the next few months relative to our January forecast; this upward revision would have been larger if not for the projected effect of the budget sequester on second-quarter spending.

Over the medium term, we continue to anticipate that labor market conditions will improve gradually as real activity and production accelerate. As shown in the top-left panel of your "Forecast Summary" exhibit, we expect the unemployment rate to decline to 7 percent at the end of next year; this is unrevised from our January projection but is $\frac{1}{2}$ percentage point lower than the forecast we made in September, when the FOMC first tied its asset purchase decisions to an improvement in the labor market outlook. Again in line with our January forecast, we anticipate that on a quarterly average basis, the unemployment rate will fall below the Committee's $6\frac{1}{2}$ percent threshold in the fourth quarter of 2015. We continue to expect the pace of job gains to improve over the forecast period; as is evident from the top-right panel, our outlook for the pace of job growth from here forward is similar to what we anticipated back in September, with growth in total payroll employment reaching about 225,000 jobs per month, on average, over the second half of next year. Nonetheless, as shown in the middle-left panel, revisions to historical data, mostly reflecting the annual benchmark, imply a higher level of payroll employment throughout the projection period.

Even aside from the labor market, the incoming news has mostly been a little better than we had anticipated. Manufacturing production has come in stronger than expected, and available forward-looking indicators have also brightened a touch and remain consistent with moderate gains in factory output in coming months.

This morning, the Census Bureau published their monthly report on housing starts and permits. These data were a little stronger than we had expected in the Tealbook—certainly enough, for now, to support our forecast that residential construction will contribute about $\frac{1}{2}$ percentage point per year to real GDP growth over the medium term—a welcome turnaround for that sector. In the Tealbook, we once again presented an alternative to our baseline projection that explored the implications for the rest of the economy of an even more robust recovery in the housing market.

On the downside, we've been surprised by the way that the fiscal situation has played out thus far. In the January Tealbook, we assumed that the budget sequester would be replaced by a more gradual pace of fiscal consolidation that would achieve roughly the same fiscal restraint over the 10-year budget window but have no macroeconomic effect this year. In the forecast for this meeting, we've assumed that the Congress will eventually take some of the hard edges off the spending cuts, leaving roughly half of the fiscal restraint in place this year and next that is implied by current law. Other things being equal, this new fiscal policy assumption reduces

the level of real GDP by the end of this year by a couple of tenths and adds one-tenth to the unemployment rate. As we noted in the Tealbook, a full sequester would double those numbers, and the rumblings on Capitol Hill during the past few days incline me a little more toward that view.

All told, our medium-term real GDP projection, shown in the middle-right panel, is little changed from January. In particular, the greater drags from fiscal policy and a stronger foreign exchange value of the dollar in this forecast were mostly offset by the effects of upward revisions to household net worth, stemming from positive surprises to house prices and equity values. In addition, we've revised up our projection for domestic oil production in line with Department of Energy forecasts, and this yields a decline in projected oil imports.

The last two panels of the exhibit summarize our inflation projection. The data on core prices that we've received since the January Tealbook—including Friday's CPI report—were close to our expectations, and we've made no material revisions to the forecast for core PCE inflation, shown on the right. We made a small downward revision to our forecast for headline PCE inflation, the left panel, over the first half of the year in response to incoming data on energy and food prices; after that, our headline inflation projection is little revised from January, at about 1½ percent per year.

In sum, our outlook for real activity, the labor market, and inflation is very similar to what we had written down in the January Tealbook, even taking on board the effects of a modified sequester. As a result, we've continued to assume that the FOMC will make a total of \$500 billion in asset purchases this year. Of course, we'll be listening intently to your discussion this afternoon of the efficacy and costs of these purchases and will modify our purchase assumption for the April Tealbook accordingly.

Finally, as noted in the Tealbook, we now view the uncertainty around our projection for economic activity as similar to the relatively elevated level that has prevailed, on average, over the past 20 years. We also continue to view the risks to our real activity projection as skewed to the downside, especially given the limited scope for monetary policy here at home to offset the effects of an adverse demand shock of whatever origin. For inflation, we see significant uncertainty around our projection but do not believe that these risks are unusually high, and we continue to view the risks to our inflation forecast as roughly balanced. Steve will continue our presentation.

MR. KAMIN. After growing only 2¼ percent last year, well below its historical trend pace, output in the foreign economies is expected to rise at a 3 percent pace this year and 3½ percent in the two years after, enough to start providing meaningful impetus to U.S. exports. This outlook is a touch weaker than the January Tealbook, as reasonably good news for the emerging market economies largely balanced out pretty bad news in the advanced economies.

Starting with the good news, as you will recall, through much of last year, we'd been worried about the slowing of growth in emerging market economies, especially in East Asia. However, by early January of this year, it became apparent that China was not headed for a hard landing, and more recently, fourth-quarter data for other East Asian economies as well as Mexico showed surprising strength. This bodes well for the overall strength of the global economy, although, going forward, we are not inclined to extend this momentum into further increases in emerging market growth. First, Chinese data for the past few months have come in somewhat tepid, and with new measures being announced to cool the property market, we see economic growth subsiding from above 9 percent in the fourth quarter of last year to near 8 percent in China for the remainder of the forecast period. Second, as I'll be discussing shortly, the outlook for the advanced economies is none too strong. To the extent that inventories and production in some emerging market economies owed their recent strength to anticipations of stronger demand from Europe and other advanced economies, production levels in EMEs may have to be scaled back a bit. All told, we see emerging market growth holding steady at 4¾ percent, roughly its trend pace, over the next few years.

Turning to the bad news, I'll start with the Italian elections. The relatively pro-euro and pro-reform parties failed to gain a decisive majority, while the parties led by Silvio Berlusconi, who is fighting multiple criminal convictions, and Beppe Grillo, professional-comedian-turned-politician, made surprising advances. Over the next few weeks, these parties will struggle to form a coalition government, but it will likely be weak and new elections may need to be held later this year. Although the previous government under Mario Monti already passed important fiscal measures, a caretaker government will probably fail to push forward badly needed pro-growth structural reforms. More worrisome, in the event of unexpected stresses, it may be unable to commit to the credible adjustment program that would be required to allow the ECB to provide Italy protection under its OMT framework.

Adding to the volatility in Europe, as Simon noted earlier, last Friday, European leaders announced a €10 billion assistance program for Cyprus to help recapitalize Cypriot banks. However, plans to impose taxes on insured deposits under the program—a decision that shocked and dismayed observers—triggered a political backlash in Cyprus and market downturns around the world, leading European leaders to backpedal on their initial plans. Even as we speak, the Cypriot parliament is considering a plan under which insured depositors would be better protected while uninsured deposits above €100,000 would be subject to a larger tax. However, approval is not assured, the banks in Cyprus remain closed, and the situation is in considerable flux. Thus, even though the GDP of Cyprus amounts to only 0.2 percent of euro-area GDP, there's potential to undermine depositor confidence in other peripheral countries.

Beyond the financial sphere, incoming data suggest that the recession in the euro area has been deeper than we had previously anticipated. Fourth-quarter GDP declined 2.3 percent at an annual rate, more-recent data on production and spending have been weak, and the region's unemployment rate edged up to 11.9 percent in

January. Taking into account both the poor economic data and the greater financial stresses resulting from the events I described earlier, we now anticipate that the euro-area recession will not bottom out until the middle of this year and will recover more slowly than we thought in January.

Elsewhere in the advanced economies, the data have also been downbeat. GDP contracted in the fourth quarter in the United Kingdom and barely rose in Canada and Japan. For the current quarter, manufacturing surveys point to further contraction for the United Kingdom, while Canadian data suggest a more modest pickup in economic activity than we'd anticipated. In light of the diminished momentum of these economies, along with the effects of slower growth in the euro area, we're now projecting this year's pickup in output to be a little more sluggish than in the last Tealbook. All told, aggregate growth in the advanced foreign economies is now expected to rise from a moribund ½ percent last year to a still-subdued 1¼ percent this year and around 2 percent over the remainder of the forecast period. In consequence, the slack in the advanced foreign economies diminishes quite slowly and inflation pressures remain contained throughout.

With the fatigue in these economies hanging on tenaciously, foreign central banks appear set, at a minimum, to delay their exit from highly accommodative policies. In our outlook, the Bank of Canada pushes back its next policy rate tightening a quarter later in 2014, while the Bank of England expands its quantitative easing program, and even the ECB cuts its main policy rate another 25 basis points, to ½ percent.

But certainly, it is the Bank of Japan that will likely take the most aggressive turn toward greater stimulus. Under pressure from Prime Minister Abe, the BOJ has already raised its inflation target to 2 percent, and with its new governor, Haruhiko Kuroda, the BOJ is expected to substantially bolster its quantitative easing program. But to what extent it will boost the program, and how successful that will be, remains anybody's guess. To see what the BOJ is up against, let's assume—rather heroically—that BOJ asset purchases have similar economic effects to those we've estimated for our LSAPs in the United States. Under those circumstances, it would take an additional 60 percent of GDP in asset purchases, roughly tripling the size of its balance sheet, to push inflation from its current pace of about 0 percent to the BOJ's new target of 2 percent. Even under its more aggressive new leadership, balance sheet expansion of this magnitude seems unlikely. To be sure, both Japan's economic growth and its inflation rate could benefit from an improvement in expectations triggered by the policy—and Simon pointed to some evidence of this in his briefing—but it is very hard to gauge how large this benefit will be. Accordingly, we are projecting that the underlying inflation rate, abstracting from the effects of scheduled hikes in the consumption tax, will rise to only ½ percent by the end of 2015, while economic growth is insufficient to substantially narrow the output gap.

Mounting expectations for additional monetary easing in the advanced foreign economies led the dollar to notch up nearly 2 percent over the intermeeting period, with a surprising 5 percent further rise against the yen. The yen fell against many other currencies as well, reigniting complaints that the monetary policy easing

pursued by some central banks was intended to achieve competitive devaluation and would lead to so-called currency wars. However, as emphasized in the G-7 communiqué issued to tamp down these concerns, monetary accommodation both here and abroad appears well focused on easing domestic financial conditions rather than on lowering currencies. And, in the event, as David Wilcox noted earlier, the adverse effects of the higher dollar on U.S. trade in our current forecast are offset by projected lower oil imports. In consequence, net exports exert a neutral influence on GDP over the forecast period, the same as in the January Tealbook. Nellie will now continue our presentation.

MS. LIANG.³ Thank you, Steve. I will be referring to “Material for Briefing on Financial Stability.” My remarks today on financial stability are focused mainly on the risks that may arise in a low interest rate environment.

MR. PLOSSER. Nellie, I’m sorry. Can you speak a little louder, please?

MS. LIANG. Oh, I apologize.

MR. PLOSSER. These old men on the end of this table are hard of hearing.

MS. LIANG. My remarks today on financial stability are focused mainly on the risks that may arise in a low interest rate environment. The main risk is that a prolonged period of low rates will encourage excessive risk-taking and foster financial imbalances. A related risk is that rates do not stay low and instead rise sharply and unexpectedly, which might destabilize key markets or institutions. I would note that I am addressing behavioral risks associated with low interest rates and am not specifically addressing the risks of LSAPs, which will be discussed later. This review is based on the QS materials distributed to the Committee.

Starting with the banking sector, the results of a variety of ongoing staff analyses suggest that the commercial banks generally are sufficiently capitalized to withstand severe credit or interest rate shocks. Capital and liquidity positions at the largest banking firms have strengthened considerably in recent years. As shown in the top-left panel by the solid bars, the aggregate Tier 1 common capital ratio at the largest BHCs has been climbing since 2008 and, at the end of 2012, is about double the level in 2008. Moreover, as shown by the hashed, rightmost bar, the post-stress capital ratio at the end of 2014 under the severely adverse macroeconomic scenario estimated in the recent Dodd–Frank stress tests remains relatively high—indeed, above the 2008 level—and indicates that banks now are better positioned to absorb, rather than amplify, adverse shocks to the financial system.

In addition, as shown in the right panel, bank stock prices have been rising generally since the middle of last year, though net gains have been quite modest since late 2008. Investors appear to have been distinguishing among firms in the recent DFAST and CCAR results, as Simon pointed out, as firms with higher post-stress

³ The materials used by Ms. Liang are appended to this transcript (appendix 3).

ratios or higher expected shareholder distributions had positive abnormal returns on the announcements of the results. Not shown, CDS premiums and systemic risk measures for most of these firms are at or near multiple-year lows.

The stress tests focused largely on an adverse credit event. An alternative risk related to low interest rates is that banks, in the face of low net interest margins, will increase duration risk by increasing the maturities of their assets. Such behavior could leave them more exposed to outsized losses following a rate shock or potentially fuel an unsustainable rise in bond prices. We looked for evidence that banks were increasing their duration risk by looking at the balance sheets of banks using the available, somewhat crude, measures from the Call Reports. The middle-left panel shows that the distribution of the gap between the average maturity of assets and the average maturity of liabilities at large banks in 2012, the red line, did not change significantly since 2010, the dark-blue line. At small banks, which are plotted to the right, the distribution has shifted a bit higher in the past two years, as the average maturity of securities and loans has increased. Thus, this subset of small banks could now face greater losses were rates to rise sharply and unexpectedly, but their small holdings in aggregate suggest they are probably not materially affecting bond markets.

As noted in the bottom panel, the staff has been evaluating interest rate risks at the largest banking firms in a separate exercise using supervisory data and banks' own internal analysis. We find that a rise in rates would reduce the value of assets, and the effect of a sharp rise would be material, especially for long-dated securities in the AFS portfolio. However, banks can hedge: In addition to any derivatives they may use, banks have a "natural hedge" associated with their ability to issue deposits at below-market rates. On balance, the staff's assessment is that the effect of upward rate shocks on firm valuations would be manageable. In line with this, many banks' internal measures suggest that a moderate upward shock to rates (such as a parallel shift of 100 to 200 basis points in the yield curve) could increase banks' valuations. However, the effects depend importantly on whether banks can retain deposits at low cost as rates rise. We looked at past episodes of monetary policy tightening and found that core deposits have been fairly stable; following the expiration of the Transaction Account Guarantee (TAG) program at year-end, deposits have been holding steady in recent weeks, suggesting that depositors may not currently be unusually flighty.

Your next exhibit focuses on the shadow banking system. Overall, leverage and maturity transformation have been rising, but levels appear to remain moderate relative to pre-crisis levels. Activity in short-term wholesale secured funding markets, shown in the top left, is proxied by primary dealers' borrowing and dealer financing for customers against debt securities. The difference, net borrowing—the red line—a measure of dealer financing positions, has been moving up steadily. In addition, based on responses in the most recent Senior Credit Officer Opinion Survey, dealers reported increased demand by clients to fund structured finance products. As shown, notable fractions of dealers reported somewhat greater demand by clients to fund CMBS, the black line; agency RMBS, the red line; and even non-agency RMBS.

In other responses, dealers indicated that the use of financial leverage by hedge funds had risen a bit, but the use of leverage by other important classes of clients remained basically unchanged over the past year.

As shown in the middle left panel, securitizations increased last year (and continued apace in the first quarter—not shown), although issuance for most types is still a small fraction of pre-crisis levels. Strong investor demand is reportedly contributing to a rise in CMBS issuance, shown by the green shaded area, raising concerns that underwriting standards will loosen over time. Also, CLO issuance, the red area, has continued to accelerate, and investor demand for CLOs already appears to be contributing to price and nonprice pressures in the leveraged-loan market. As shown to the right, a signal of such pressures is the increasing amount of leveraged loans that are issued with fewer covenants. Still, it appears that the new CLOs have more conservative capital structures than their pre-crisis versions, and the AAA-rated tranches appear less likely to be financed in short-term funding markets.

A more notable sign of increased maturity transformation appears in the growth of agency REITs, shown in the bottom-left panel. Agency REITs have grown rapidly and now hold about 5 percent of agency MBS outstanding; they continue to raise capital, given they've been able to provide dividend yields to their shareholders in the mid-teens. While leverage, shown by the red line, currently is lower than in the mid-2000s, they rely heavily on short-term bilateral repurchase agreements to fund their agency MBS holdings. Thus, these firms engage in significant maturity transformation and hold securities whose values are interest rate sensitive. Agency REITs are vulnerable to a sharp decline in MBS values that could lead to a rise in repo haircuts or a pullback in short-term funding, which could lead to forced sales of MBS. Moreover, as shown in the table to the right, as REIT agency holdings have grown from about \$105 billion in 2009 to \$368 billion in 2012, broker-dealer inventories, the second line, have grown by much less, suggesting that dealers may be less able or willing to absorb any sales.

Agency REITs are interesting not only because they are indicative of reach-for-yield behavior, but also because their actions could amplify price changes in the agency MBS markets. As will be described later by Min Wei, continued rapid growth of agency REITs that dynamically hedge could raise the risk that they amplify an upward rate shock through a convexity feedback loop.

Turning to asset markets, prices of risky assets have risen, but valuation measures in major asset classes do not appear rich by historical standards. As shown in the top-left panel, the expected real return on equities remains near 8 percent, and its gap to the real Treasury yield is still unusually wide. Real estate prices (not shown) also have risen, but valuations, except for farmland, remain subdued. As shown to the right, spreads on corporate bonds have narrowed, but the far-forward premium, the black line, which can be a proxy for investor risk aversion, does not appear to be far from its historical average.

Even so, there are signs of imbalances in the leveraged finance market, as many investors have moved out the credit curve for return. Investor demand for such products, shown in the middle-left chart, has soared. In addition to CLOs, the purple line, assets under management of high-yield bond and loan mutual funds, the black and red lines, have risen notably in the past few years. At the same time, as shown to the right, while gross issuance of syndicated leveraged loans and high-yield bonds, the light-blue bars, has been high in the past three years, a large percentage of the debt has been issued to refinance existing debt, and outstandings, shown by the line, have not kept pace with demand.

Although recent trends could imply significant losses in the future for some leveraged finance investors, as noted in the bottom left, we do not currently see a reemergence of financial leverage to fund risk positions or large bank exposures, some of the amplification channels that were evident in the crisis. To mitigate risks, supervisors are issuing new leveraged-loan guidance on the underwriting standards and on managing underwriting commitments, especially should LBOs accelerate. But risks can arise in other, new forms. For example, a potential amplifier is liquidity transformation provided by ETFs that reference corporate debt. In good times, ETFs can offer and enhance liquidity, but we need to do more work to understand whether the disparity in the liquidity of ETFs and the underlying bonds could propagate losses in stressful times.

The bottom-right panel shows that the private nonfinancial credit-to-GDP ratio ticked up slightly in the fourth quarter, boosted by growth in consumer credit and nonfinancial business debt. Still, the ratio remains well below its long-run trend, suggesting that broad credit trends are not pointing to a significant buildup of financial imbalances.

In summary, low rates have contributed to gains in asset prices and debt growth, though from weak levels. Major financial institutions do not appear to have taken on excessive credit or duration risk, and increases in leverage and maturity transformation in shadow banking and asset markets have not been widespread. But signs of froth are emerging in some areas, and the potential for emerging imbalances to broaden or accelerate is increasing. The staff will continue to closely monitor these trends and to develop a variety of potential policy responses. Bill Bassett will continue our presentation.

MR. BASSETT.⁴ Thank you, Nellie. I'll be referring to the packet labeled "Material for Briefing on the Summary of Economic Projections." Unfortunately, I need to start by pointing out that in the top panel of exhibit 2, all the way to the right, the memo item for the Tealbook longer-run growth should be 2.3 and not 2.5.

Returning to exhibit 1, the exhibit shows the trajectories of your forecasts for key economic variables under your individual assessments of appropriate monetary policy. As shown in the top panel, you project that growth of real GDP will pick up

⁴ The materials used by Mr. Bassett are appended to this transcript (appendix 4).

this year relative to last year and strengthen further in 2014 and 2015 to a pace above what you see as its longer-run rate, shown to the right. Your projections for the unemployment rate, shown in the second panel, decline gradually over the forecast period, but many of you expect the unemployment rate at the end of 2015 to remain significantly above your individual judgments of its longer-run normal level. Turning to the bottom two panels, the central tendency for your projections for inflation lies somewhat below the Committee's 2 percent longer-term objective in 2013 and then approaches 2 percent over the projection period.

Exhibit 2 compares the ranges and the central tendencies of your current projections with the December SEP and the March Tealbook. Your projections for economic growth and inflation over the forecast period are generally unchanged to slightly lower relative to those you made in December, with many of you noting that better-than-expected incoming data from the private sector about offset the effects of greater-than-anticipated fiscal restraint. The central tendency for your unemployment rate projections is also generally unchanged to a couple of tenths lower over the forecast period, with some participants attributing the change in their projections for unemployment in part to the recent improvement in some labor market indicators. The Tealbook forecast puts economic growth in the middle of your central tendencies for the next two years, and then near the upper end in 2015. Meanwhile, the Tealbook projections for unemployment are close to the upper ends—and, for inflation, near the lower ends—of your central tendencies through 2015.

Exhibit 3 provides an overview of your assessments of the appropriate path for the federal funds rate. As shown in the top panel, 5 participants believe that economic conditions will warrant increasing the federal funds rate this year or next year, while the rest think that it will not be appropriate to begin raising the funds rate until at least 2015. The middle panel of the exhibit provides your current assessments of the appropriate target for the federal funds rate at the end of each year of the forecast period and over the longer run. Among the participants who see the funds rate leaving the effective lower bound in 2014 or earlier, the median projection for the funds rate is 1 percent at the end of 2014 and 3 percent at the end of 2015. In contrast, the 13 participants who judge that liftoff in 2015 will be appropriate expect the funds rate at the end of the year to be 1¼ percent or less, while the 1 participant who anticipates liftoff in 2016 sees the funds rate at 50 basis points at the end of that year (not shown). On balance, your current projections for the federal funds rate have shifted down a bit from those in your December forecasts, which are shown in the bottom panel.

With regard to securities purchases, five of you indicate that your assessment of appropriate policy is about in line with the assumption in the Tealbook baseline forecast, which is conditioned on purchases of longer-term securities continuing at a pace of \$85 billion per month through mid-2013, for a total of about \$500 billion this year. However, a majority of you think that it will be appropriate to continue purchases beyond that point. Some of those participants believe that appropriate policy involves tapering purchases beginning at midyear, while others see purchases continuing at the current rate into the second half of the year. Those who judge that it

will be appropriate to continue the purchases beyond midyear generally anticipate that total purchases will range from \$750 billion to \$1.25 trillion. In contrast, a few participants appeared to indicate that it would be appropriate to begin tapering purchases as soon as this meeting or to end the purchases altogether.

Exhibit 4 depicts the economic conditions that you anticipate at the end of the year in which you judge that it will become appropriate to raise the federal funds rate above its current target range. Your projections for the unemployment rate range from about 5½ percent to 7 percent, with a median of 6¼ percent, while your inflation projections are in a narrow range of roughly 1½ to 2¼ percent, with a median of 2 percent. All 14 of you who see an initial increase in the funds rate occurring in 2015 or later, shown by the gray circles and blue square, project unemployment at or below the Committee's 6½ percent threshold at the end of that year; most in this group also see inflation at 2 percent or below. All but one of the participants who judge that the first funds rate increase should occur in 2013 or 2014, shown by the blue triangle and white diamonds, see a higher level of unemployment at the time of the first funds rate increase than do those reporting later firming dates. Those who incorporated an earlier tightening of policy pointed to concerns about inflation as a primary reason for expecting that it will be appropriate to raise rates before 2015; they generally also preferred to end or reduce the asset purchase program relatively soon.

The final exhibit reviews your assessments of the uncertainty and risks surrounding your economic projections. As shown in the top two panels in the column on the left, while the majority of you continue to indicate that you judge the current level of uncertainty about GDP growth and unemployment to be higher than the average level over the past 20 years, a greater number of you than in December see the level of uncertainty as being broadly similar to the average. Moreover, the corresponding panels to the right indicate that the majority of you now view the risks to GDP growth and unemployment as broadly balanced, though most of the rest of you see downside risks to growth and upside risks to unemployment. Turning to the bottom-left panels, your assessment of the uncertainty associated with your projections for total PCE inflation is little changed from December, with a majority believing that it is broadly similar to the average level of uncertainty over the past 20 years. As in December, almost all of you see the risks to your inflation outlook, shown to the right, as broadly balanced or weighted to the downside. In assessing the risks to the outlook for real activity and prices, a few participants note that uncertainty is greater when conducting monetary policy near the zero lower bound. Thank you. That concludes the staff presentations.

CHAIRMAN BERNANKE. Thank you for a very informative presentation. Are there any questions? Vice Chairman.

VICE CHAIRMAN DUDLEY. I'm not sure whom this should go to—maybe Nellie, maybe David. Financial stability, house prices: What level of house price increases would be

good, and what level of house price increases would be bad? There's some level where you start to get concerned that we were just reinflating a housing bubble, and that would be probably much more significant than all of these other markets we're looking at, because it's such a big component of the economy.

MR. WILCOX. I guess I'd just say that from the perspective of valuation, the current level and the prospective level over the next couple of years in our baseline projection still look a little lean relative to the very crude tool that we maintain for assessing house prices relative to rents. So we're way below fair valuation as judged by this crude valuation. At the peak of house prices, we were noticeably above. It's funny that you asked the question, because I just looked up the answer in my notebook, and it's not there, but my recollection is that we're in the high single digits below fair valuation at the moment. So it's a concern. I think it's still a concern for the future, at the moment, in terms of assessing the risk of a reversion back to normal valuation.

VICE CHAIRMAN DUDLEY. And what would concern you? I guess I feel as though 5 to 10 percent would be fine, in my mind. But 10-plus—I would start to get nervous. Fifteen-plus—

MR. WILCOX. I'll turn it over to Nellie, but I would just say that—

VICE CHAIRMAN DUDLEY. But I feel as though we need to get our arms around this a little bit more.

MR. WILCOX. —our ability to judge valuation is so crude that I'm a little hesitant to give you a number there.

MS. LIANG. Just to pick up on where David was leaving off, I think our current valuation measure still puts house prices in the minus 9, 10 percent range relative to their long-run relationship to rents. So they're quite low. I think we're questioning our ability to judge and

whether prices are sufficient to tell us about overvaluation, though. We also want to be looking at underwriting standards. That would start to give us a hint of, if we started to see credit widely available to residential mortgage borrowers—we're not there yet—we would start to think about the point at which house price valuations were starting to—

VICE CHAIRMAN DUDLEY. So you'd be more focused on activity measures as opposed to price measures.

MS. LIANG. I think we would want to be focused on volumes and underwriting standards as well as just the prices.

VICE CHAIRMAN DUDLEY. Okay. Thanks.

CHAIRMAN BERNANKE. President Rosengren.

MR. ROSENGREN. My question is for Nellie as well. I really enjoyed the discussion of agency REITs. I thought it was a very nice discussion. And I'd like you to speculate a little bit about how what's happening with agency REITs interacts with monetary policy actions. Let me tell you how I'm thinking about it and see if it's consistent with the way you would think about it. MBS purchases flatten the yield curve. So that should make the carry trade less profitable. If you stop MBS purchases, it would presumably steepen the yield curve relative to what it otherwise would be. And to the extent that it also slows down the economy relative to what it otherwise would be, we reach 6½ percent unemployment later. So we would continue for longer our very short-term interest rates, which, in my mind, would increase the incentive for agency REIT expansion. My question is, am I thinking about this right—that actions that delay liftoff aggravate the concerns of the agency REITs?

MS. LIANG. They operate on the yield curve, as you point out. Obviously, the growth of the REITs is related to the yield curve. Plus, there's a structural factor. I think it is not an

accident that they're growing as the GSEs are contracting. They're picking up some of that. So, part of it is yield curve, but part could be other factors. Agency REITs play on two margins: One is maturity transformation, and the other is leverage. Even if you left the yield curve a little flatter, they could instead leverage. So I'm not quite sure if you can get a clean prediction for what they will do if you change the yield curve, only because they can play on leverage as well. If the yield curve gets flatter and the carry is just a little less, they can instead up their leverage. Currently, they're operating with pretty modest leverage, but it seems as though, in the past, some of these firms have increased leverage to boost return when they've had to.

VICE CHAIRMAN DUDLEY. But isn't there a limit on leverage, because if you have to have collateral to pledge, and—

MS. LIANG. Yes, there is some.

VICE CHAIRMAN DUDLEY. They're constrained at some point, right?

MS. LIANG. I think that's right, although in the chart that we show, the leverage multiple in the mid-2000s was twice what it is now. And in 2000, it was really high, although that was such a small market at that time.

MR. TARULLO. But Nellie, the accessing of greater or lesser leverage is not itself dependent on the monetary policy move, right? So, if Eric's question was, hold everything else—

MS. LIANG. Yes. If you hold everything else constant, I would agree, but I was making the point that they operate on two margins to deliver yields to shareholders.

CHAIRMAN BERNANKE. President Plosser.

MR. PLOSSER. Thank you, Mr. Chairman. I'd like to change topics just a little bit from financial stability. I want to thank the Board staff for addressing my question from the last

meeting about the implications of the re-estimation of the output gap that they have been doing for the optimal control exercises. I thought their results were very instructive, and I appreciate that. My takeaway from those exercises, though, is that we must be cautious in using the optimal control paths depicted in the Tealbook as very precise guides to policy. The paths are highly model-specific, which is why I've always been interested in the robust rules literature.

Moreover, as the exercises illustrate, these optimal paths calculated in real time depend on lots of different factors. Two of the important ones that I think the staff memo highlighted are the estimate of the output gap and also the projected trajectory of that gap. And, of course, the projected trajectory of the gap is a feature of the model, the dynamics built into the model, and the forecast that comes out of the model. So, all else being equal, I think, overestimating the gap would lead to policy being overaccommodative relative to what it otherwise would have been.

What the staff exercises show—and I believe the staff noted this—is that the incorrect dynamics of the model or unforecastable future negative shocks cause the trajectory of the gap to be different from what they had thought it was going to be. And that led to the conclusion in the memo that optimal policy should have been, perhaps, slightly tighter in the near term, but much looser for longer, given the real-time data we have seen. So I think that when the gap gets revised or reality sets in, the optimal control path will be different. But I think of those two effects as logically separable.

The effects are well illustrated in the charts. In hindsight—for example, in 2010—the Fed staff was projecting too large of an output gap. But they were also forecasting that the gap would close much quicker than in fact it has ended up doing. This means that the real-time optimal control path in early 2010, in hindsight, was perhaps too accommodative in the early trajectory, but it called for us to tighten sooner than we should have ex post as the data played

out. Similarly, in hindsight, at the beginning of 2012, the staff was projecting too large of an output gap. But there has been little revision in the trajectory of the gap going forward, so it's about the same as it was. What that means—and it shows up in the graphs—is that the real-time optimal control path in early 2012 called for a policy that was in fact too accommodative in 2013 relative to what we now think was optimal. So I think those two examples illustrate the different effects that result from the trajectory versus the level of the output gap.

The bottom line for me from this analysis is that when we view these optimal control exercises, we need to take into account the kinds of risks and uncertainties that we are facing. It's not just about measurement of the gap, as the staff points out; it's also about how the forecast plays out. One of the things that we face is making judgments as a Committee based on these forecasts and these optimal paths. And so I'm still quite interested, for example, in having the staff provide some measure of uncertainty or forecast error that feeds into these optimal control policies for us to think about. Now, I realize that the reality is that those are likely to be quite large and maybe humbling, in some sense. But I think the nature of that uncertainty, if it's reflected in some way in our discussions more explicitly, would allow the Committee to have different types of discussions instead of only focusing on these modal values that come out of the paths. So I hope that the staff would continue to explore options or opportunities to give us more degrees of uncertainty about how these paths might look under different scenarios or forecast errors, if you will. But again, I want to thank the staff for all of that work.

CHAIRMAN BERNANKE. A two-handed intervention from President Evans.

MR. EVANS. Well, I just want to make sure I was looking at the same memo that President Plosser was, because the opening of it, I thought, ended with, "Generally speaking,

these comparisons indicate that the ‘real-time’ estimates of optimal policy were, in hindsight, insufficiently accommodative.”

MR. PLOSSER. Right. There are two effects going on there, which I think the memo made clear. One effect was the change in the ex post evaluation of the gap and the other was about the nature of the forecast going forward. So you had two effects at work. And it turned out in the early episodes that they were offsetting. In fact, the fact that the forecast was bad turned out to dominate the effect in the early years. But in 2012, it was working the other way. Now, of course, we haven’t revised the forecast for 2012 yet, and that may happen again. But they’re just two separate effects, is what I was trying to say.

MR. EVANS. But I thought the force of your original question was that perhaps we’d been overly accommodative and we should have been more restrictive. And at the end of the analysis, it still is the case that we weren’t as accommodative as we should have been.

MR. PLOSSER. But it’s important to understand why.

MR. EVANS. When you’re missing by a lot—I don’t know. Okay. Yes. Thank you.

CHAIRMAN BERNANKE. I guess I would just raise the point that the unconditional optimal control path will have a lot of uncertainty. Another interesting question, given that we have conditional forward guidance, is whether the conditional forward guidance would still work even if there were information coming in that made you vary your unconditional path. That’s another, somewhat different question.

MR. PLOSSER. Yes. There could be other ways of posing those questions as well.

CHAIRMAN BERNANKE. President Fisher.

MR. FISHER. I want to come back to Bill’s question about housing. I think one thing we should be looking for, Nellie, is the composition and the nature of what’s going on in

housing, not just the price levels. We've done a little work at the Dallas Fed, and by our numbers, last year 36 percent of homes were purchased without mortgage financing. Now, part of that has to do with the nature of the market, the availability of mortgage financing. But there are a significant number of anecdotal reports that investors are crowding out natural buyers, particularly in the \$200,000 price mark and lower. I realize that in San Francisco, that's a closet, but across the rest of the nation—

MR. WILLIAMS. A nice closet.

MR. FISHER. A nice closet. So we ought to maybe take a deep dive into that, because at least in the case we're seeing in our local market, private equity groups have put together funds. They're literally sending around notices to buy a house at tax appraisals or higher. Keith Phillips, our economist in San Antonio, received an unsolicited bid, a much higher price than he expected, on his house. But their investment timeline is usually 7 to 10 years. So, again, I'm trying to think down the road here. Probably pricing to rent, hoping for further price appreciation, but could be something that could lead to a little volatility in the housing market. I just think we have to watch the composition as well as ask ourselves what the price appreciation itself is. It has been fantastic—27 percent in Phoenix, for example. How much of that is investment buyers? And then on your point on charts 3 and 4 in exhibit 2, and I think chart 3 in exhibit 3 of yours, Nellie, these are more conservative structures than the CLOs. But when you see a line as steep as you see in chart 3 in exhibit 3, and particularly as steep as the high-yield bond demand, it does send out, I would think, at least a little bit of a yellow light. I'd just ask you to continue to monitor that.

One other aspect may be useful to monitor—I corresponded a little bit with Governor Stein on this—and that is looking at margin debt as a percentage of market capitalization. Ned

Davis and some others do work on this. I don't know how good that work is, because they produce so much volume, a lot of noise. But if you look at where we are right now, we're back to levels that prevailed before previous serious market corrections. I don't see that in here, and maybe you do have it in the broader report. I didn't get a chance to go through it. I would appreciate that very much.

MS. LIANG. Okay.

MR. FISHER. And then lastly, with regard to Cyprus, you can't look at Cyprus without looking through the lens of organized Russian crime or corrupt Russian bureaucracy, including the president himself. That will determine the outcome of the election. I would suggest that.

MR. KAMIN. Well, we're well aware of the Russian connection.

MR. FISHER. Right.

MR. KAMIN. And it is a connection that has definitely complicated choices.

MR. FISHER. Russian deposits appear to be the same size as the entire GDP of Cyprus.

MR. KAMIN. That sounds about right, so it's very complicated.

MR. FISHER. You don't mess with those folks.

MR. KAMIN. And it's either being dealt with or not being dealt with right now.

CHAIRMAN BERNANKE. I forecast an international incident in five years. [Laughter]

President Evans.

MR. EVANS. Thank you, Mr. Chairman. My question is perhaps a little bit of a technical one, and it's for Nellie—exhibit 1, chart 5. You don't really have to look at it. You have an experiment where you assume a parallel shift of 100 to 200 basis points. I asked my own staff this question, because I'm never quite sure what the economic circumstances are that we have in mind for a parallel shift. We all know there's a literature that looks at this, and slope

movements in yield curves are a little more identifiable, at least empirically, with changes in monetary policy—Mr. Chairman, you’ve done research in that regard—or changes in demand, transitory types of things. When we start talking parallel, though, it’s a little harder to think about what we mean, and in fact, if it’s inflation expectations, transitory inflation expectations wouldn’t do it in parallel. It would have to be some—excuse me—God-awful type of increase in inflation, which, of course, is something to be concerned about, but it also probably reduces the probability. When the staff does this experiment, what do you have in mind? Any help there, please? I don’t get satisfactory answers from my own staff. [Laughter].

MS. LIANG. Generally, one of the practices we noticed is that when banks do their own evaluations, they do two things. One is, they look at earnings at risk, which is their year-ahead look at how things look. And then some of them look at valuations of the firm. Not all of them—most of them focus on earnings. They tend to do parallel shifts. So we did them to be comparable, in some sense, to see, did we reach the same kinds of conclusions? In terms of how to interpret that, when we think about monetary policy, we think of rising interest rates as generally having a negative effect on banks—not a lot bigger than the broader market, just maybe an abnormal return but not too big; an increased maturity gap, though, that hurts their returns even more. That’s the way we’ve been thinking about that.

MR. EVANS. Sure, that’s quite reasonable in the context of—

MS. LIANG. That’s really all I can add to that. I’m not sure I’m getting exactly to your question.

MR. EVANS. No, that’s fine.

MR. REIFSCHNEIDER. I just want to add one thing because this comes up in the fiscal memo that we did. In that memo, we also considered a high interest rate environment. But, we

did it a slightly different way, and it's similar to what we do in the Tealbook. There we often ask, what is the most likely set of conditions that would generate high interest rates, based on historical correlation, variance, and things like that? And those things tend to be a combination of stronger growth, higher inflation, inflation risk premiums rising, and so on. So that's what I would say—echoing Nellie. Depending on which memos, we do it in different ways. Sometimes, we just do it a very simple way; other times, we do it more along the lines of what I think you were thinking of.

MR. EVANS. Right. Thank you, Dave.

CHAIRMAN BERNANKE. President Lacker.

MR. LACKER. Thank you, Mr. Chairman. I have a question for Nellie. Like President Rosengren, I appreciated the discussion of agency REITS. It was a good, thorough overview. I'm curious about two things. One is what you see as their main comparative advantage. They're puny, but they've been growing fast. It's striking. But then the second thing is, you say that if they were to unwind rapidly or delever, the mortgage-backed securities they hold would likely end up with broker-dealers. And I was a little curious about that because they just reached, like, 5 percent of the market. Lots of other classes of institutions hold huge amounts of mortgage-backed securities, and mutual fund holdings have been growing. My understanding of broker-dealers is that they don't let things land on their balance sheet and not do anything about them. They would have an incentive to move them on. So I was wondering how you're thinking about what would happen to them? And these are two related things because I'm wondering, if agency REITS didn't exist, where would those MBS be? And that's probably really hard to answer.

MS. LIANG. Okay. Starting with why they're growing so fast, they operate as funds with an exemption to the Investment Company Act. So they're basically bond mutual funds, but they're permitted to lever because they have this exemption. They raise capital in the public capital markets, and they've been pretty successful at doing so, because they've been offering dividend yields of about 12 to 16 percent over the last few years. And so they continue to attract capital. They raised capital in Q4. They've raised capital in Q1. The agency MBS carry is, I don't know, maybe in the 2 to 3 percent range, but they lever it and they're offering in the 12 to 13 percent range. To some extent, that's why they're growing so fast. Some of the executives at Fannie and Freddie have left and operate the second-largest one of these firms right now, so there is some expertise leaving that part of the sector and moving into a different part of the financial sector.

The underlying concern is, they have capital, but they rely heavily on repo financing. They have many counterparties. They have exposure to 20-something dealers, so they're not concentrated. But, nonetheless, it's repo funding, and a good chunk of it is very short term. Haircuts are 5 percent, and one could imagine that if spreads or prices fell, haircuts could rise and, if dealers weren't willing to absorb, some sales would have to occur. Who would buy it? There could be others, certainly, who could pick up. The problem is, there could be a lot of sales. I think these firms all have the same business model. If they have the same shock, they will all react similarly, so it just could be a bigger shock. At this point, 5 percent seems pretty small. But if they continue to grow, it's something we wanted to keep our eye on.

MR. LACKER. Could I follow up on that? So, two things. One, there are a lot of other investors that hold these, and the kind of convexity-related incentives you'd have would seem to

apply to everyone holding MBS. So I'm not sure why, in a collection of these securities in REITS—

MS. LIANG. Yes. I think a little depends on how they hedge, whether they dynamically hedge their position. The Fed is a big holder of agency MBS and does not dynamically hedge.

MR. LACKER. We don't. Right.

MS. LIANG. I think some of the banks do not. Some hold—

MR. LACKER. There are a lot of institutional holders.

MS. LIANG. And there are a lot of foreign investors. REITs are just probably one that will dynamically hedge, if they're under pressure. Their hedges may not be very good. It's one of the places where firms tend to cut corners if they're under pressure. So we're just raising it as a potential amplification mechanism if rates were to start rising and you started getting duration extension and you'd just have more sellers.

MR. LACKER. But if agency REITS didn't exist, conceivably MBS could be held by somebody who is also doing dynamic hedging.

MS. LIANG. That's correct.

MR. LACKER. So, back to the comparative advantage. I don't want to make judgmental statements about the abilities of former GSE executives, but the description suggests that some expertise at MBS valuation might be important. But that's widespread in the market. They're 5 percent of the market. A lot of other people know how to evaluate MBS. High mean returns suggest there's some risk floating around that's going somewhere or being undervalued or something. And indeed, do you guys have suspicions about what that would be? Are the equity investors being fooled here or taken for a ride? Or is there some risk that's taken off the table by somebody here?

MS. LIANG. I think the shareholders have bigger risk than they recognize if the dealers were to pull funding. But it's been several years where dealers have not pulled funding, and retail shareholders tend to like the high dividend yields at this point.

CHAIRMAN BERNANKE. President Kocherlakota, you had an intervention?

MR. KOCHERLAKOTA. I'll dial it back to a one-hander.

CHAIRMAN BERNANKE. Dial it back to a one-hander—okay.

MR. LACKER. Can I follow up on that, Mr. Chairman?

CHAIRMAN BERNANKE. President Lacker.

MR. LACKER. Just one more thought. The fact that REITs rely on RP funding, does that raise any suspicion that a perceived likelihood of public-sector support to buffer RP lenders is the extra risk that's being taken off the table here?

MS. LIANG. I don't think so. It's more of the system not internalizing that all funding could get pulled at the same time. I don't think it's an implicit government support, if that's what you're saying. I think it's more of this externality of a common business model being subject to a shock that's going to hit them all at the same time, and they all act in unison, and nobody is considering that when they're thinking about their own risk profile.

MR. LACKER. Well, I can appreciate that they might undervalue the risk of everyone pulling funding simultaneously. At the same time, they might anticipate that should that transpire, public-sector intervention would occur. Those are observationally indistinguishable in this case, aren't they?

CHAIRMAN BERNANKE. The Vice Chairman will clear it up. [Laughter]

VICE CHAIRMAN DUDLEY. I'd argue that there's an accounting problem. They're treating all of these current earnings as earnings. They should actually be setting aside a big

reserve for the day when interest rates rise, and they're not being forced to do that. So you have this impression that this is all earnings when, if the term premium truly were negative today, they should be setting aside very large reserves for when interest rates normalize, but they're not.

MR. LACKER. And equity holders are letting them do that because?

VICE CHAIRMAN DUDLEY. They're conforming to GAAP accounting, and this is all treated as current earnings. There's no reserve for the great day when interest rates rise, and that, to me, is a fundamental problem.

MS. LIANG. REITS are required to pay out 90 to 95 percent of their—

VICE CHAIRMAN DUDLEY. There's no buffer to support that day when things go in the other direction.

CHAIRMAN BERNANKE. President Bullard.

MR. BULLARD. Thank you, Mr. Chairman. I have a question on the international outlook. If I understood your narrative correctly, you said that the Bank of Japan would have to buy a whole lot of JGBs in order to get any kind of measurable impact on inflation. That was, I thought, the gist of your—

MR. KAMIN. Well, I said they'd have to buy a huge amount in order to achieve that 2 percent target.

MR. POTTER. Using our estimates.

MR. BULLARD. Using our models.

MR. KAMIN. Yes, I was using our elasticities, which, because we've worked with them, we have experience with that type of calibration. But there's no implication in my remarks that the parameters that apply to the Japanese economy are necessarily the same as those that apply to our economy.

MR. BULLARD. Yes, that's what I was going to ask. What would be your take on the success of the government so far in depreciating the yen significantly and evidently raising inflation expectations, according to this chart we saw earlier this morning, by about 75 basis points, if I'm reading that chart correctly?

MR. KAMIN. Right. I think there are a couple of crosscurrents moving in different directions. On the one hand, if you just asked me, well, what do I think about these technical efficacy concerns of promoting inflation and GDP growth in Japan compared with in the United States? I might be inclined to say that, all else being equal, I would think that it might be less in Japan because their yields are already so low, and therefore there's not as much scope to push down longer-term rates. As well, not too dissimilar to the United States, their banks are awash in reserves, and there doesn't seem to be much demand. So, on that front, I might be inclined to say the LSAPs would be less efficacious. On the other hand, what is true is that the advent of the Abe administration pushing very strong stimulus, and the BOJ moving in that direction, does seem to have created some expectational gains in Japan that are quite strong. The depreciation of the yen, which is going to be helpful for both Japanese growth and inflation, is part of that, and the increase in inflation expectations, as Simon showed, is part of that. So it is possible that there may be expectational gains from this new approach toward BOJ easing that could be much greater than we might have previously assumed.

MR. BULLARD. This is important to me because I think QE acts mostly through inflation expectations, and this seems to be what's happening in Japan, whereas if you went through the types of models that we use to evaluate QE, you would get small—

MR. KAMIN. So that's the issue that we're dealing with. We had a noted Japanese academic and an adviser to the government, Taka Ito, come by and explain how the combination

of more BOJ easing, plus structural reforms, plus fiscal expansion was directed toward making Japan jump from a bad equilibrium to a good equilibrium. So that represents the logical rationale for such policies. It's interesting, and it would be great if it worked, but we think it would be just premature to read too much into it at this point. And so that's why we're a little cautious in our revision to our forecast.

MR. BULLARD. Okay. Thank you.

CHAIRMAN BERNANKE. President Kocherlakota.

MR. KOCHERLAKOTA. Thank you, Mr. Chairman. I want to return to the agency REIT question and discussion, and I found that very helpful. Thank you for the thorough analysis. I had a question about this scenario in which there was a significant amount of deleveraging. Couldn't the FOMC intervene at that point if we felt that that was causing a sufficiently strong risk to our dual mandate objectives? Could we not intervene directly into that market at that stage?

MS. LIANG. I would think that would be a call for this Committee—we are just raising possibilities of how bad shocks to them could transpire for the economy.

MR. KOCHERLAKOTA. I guess my broader point is that there are some bad shocks here where it would be very challenging for the FOMC to respond at all, and there are some shocks where there's the potential—not to say we should, but there is the potential for us to respond very directly. This strikes me as one where it's possible to respond directly.

MR. POTTER. Because they're Open Market eligible?

MR. KOCHERLAKOTA. Yes, because it's Open Market eligible.

MR. POTTER. That was President Lacker's point, I think.

MS. LIANG. That's right, but I guess I would say that there may be a number of other ways to address this particular issue—for example, if the SEC could address eliminating the exemption. Or maybe there's a way to talk to dealers about what their business models are. Do you all really plan to pull funding at the same time? Perhaps there's a way to think about higher margins. But there is an array of different ways to address it. Monetary policy could be one.

MR. KOCHERLAKOTA. But I guess I'm reading this as a monetary policymaker. I have to treat a lot of this other stuff as exogenous to me. So when I think about these risks, some of them I can mitigate ex post—again, as you said, it's up to our judgments—and then others we're not going to be able to mitigate ex post effectively. But when I read the QS document as a whole, sometimes I'm struggling with that issue. Some of these risks I think that the FOMC, if they wanted to, could mitigate ex post, and some would be very challenging. And having some notion of that would be helpful as I read the document.

MS. LIANG. The way we're often thinking about some of these financial stability risks is that there are probably more-efficient ways to address these ex ante.

MR. KOCHERLAKOTA. Oh, I'm sure that's true.

MS. LIANG. And that's where you may want to focus some of the efforts. But it could be that the ex ante doesn't work, and so this will be at your door.

MR. KOCHERLAKOTA. Yes. Thank you.

CHAIRMAN BERNANKE. Other questions? [No response] Okay. On the agenda now, we have an opportunity to raise issues or report information on financial stability concerns. Of course, we've already had some discussion of financial stability, but a number of people have asked to be recognized. So I'll start with President Rosengren.

MR. ROSENGREN. Thank you, Mr. Chairman. Nellie didn't get a chance in her report, but I think there was a second major insight in the financial stability report, and that was some of the focus on liquidity transformation. Some of the ETFs provide liquid trading instruments on markets that are otherwise quite illiquid, potentially giving investors a false sense that liquidity will be maintained during times of stress. I applaud the attention the staff is giving to this potential risk from ETFs and other financial innovations that may pose a stability concern if investors assume that liquidity they now enjoy is immune to a breakdown during stressful times. So I encourage you to continue to work in that area. I think it's a really important area.

Second, Nellie's presentation highlighted that banks are not unusually exposed to interest rate risks, and I wanted to highlight that the recent stress test included an increase of more than 250 basis points in both the triple-B corporate bond rate and the unemployment rate over four quarters. And this stress test did examine sharp revisions in rates reflecting higher default premiums, but one can imagine many other reasons for a sharp movement in triple-B rates. The scenario that was run does highlight that at least for now, most banks subject to our stress-test modeling can weather a rapid rise in triple-B rates at the same time as an economic downturn.

The final point I want to make is that different monetary policy actions may have very different impacts on banks' financial stability risk, and so my question on agency REITS actually, I think, also applies to banks—stopping MBS purchases, steepened yield curves, and delayed liftoff, encouraging banks to conduct more carry trades. If we're worried about carry trades in the banking sector, expanding asset purchases so that we get earlier liftoff of short-term rates might actually reduce future financial stability concerns.

CHAIRMAN BERNANKE. Thank you. President Kocherlakota.

MR. KOCHERLAKOTA. Thank you, Mr. Chairman. I have not contributed much to past financial stability go-rounds, but I plan to make up for this shortfall today, although I promise not to use up all of the time that I have banked over the past two years. [Laughter]

MR. EVANS. New standard.

MR. KOCHERLAKOTA. Yes. But one of the reasons for my past reticence is that I've struggled with how to integrate the very thorough and thoughtful staff report we received into my thinking about monetary policy. I think I have made some progress on that dimension, and I hope that my admittedly preliminary thoughts can be of use to the Committee. My starting point, as always, is the dual mandate of price stability and maximum employment. Given that dual mandate, financial stability matters for us as monetary policymakers because it's potentially an important factor in shaping our outlook for prices and employment. I thought President George put this especially well in a speech that she gave in January. As she said, "A sharp correction in asset prices could be destabilizing and cause employment to swing away from its full-employment level and inflation to decline to uncomfortably low levels. Simply stated, financial stability is an essential component in achieving our longer-run goals for employment and stable growth in the economy and warrants our most serious attention." I wholeheartedly agree with those sentences.

What I'm going to do today is try to sketch my admittedly tentative thoughts about how to integrate this perspective into thinking about monetary policy. I'll start as economists always do—by making an assumption—and I'll suppose that we're concerned about the risk of an untoward financial markets event that would lead unemployment to be 10 percent at the end of 2014, about 3 percentage points above our baseline outlook. How should that concern affect our decision about buying, say, another \$500 billion in assets above what's in the Tealbook A,

baseline? Staff estimates indicate that such a purchase would reduce unemployment by 20 basis points at the end of 2014. On the other hand, that purchase may increase the probability of the bad financial markets event that in my example would raise unemployment by 3 percentage points.

Now, President Rosengren just argued that actually, it might reduce that risk, but let's take it as, it might increase the risk. Should the FOMC make the extra purchase in light of this increased probability? We're weighing off a 20 basis point decrease in the unemployment rate against the increased risk of a 3 percentage point increase in the unemployment rate. This suggests that, at least as a first-order approximation, we should be willing to undertake this purchase as long as we're not increasing the probability of the untoward financial event by more than 1 out of 15. I'm just taking 20 basis points and dividing it by 3 percentage points to get 1 in 15, which is around 7 percentage points. This suggests a way that we, as monetary policymakers, can use the financial stability report. We should be asking questions of the following type: Given the current state of financial markets, will an extra \$500 billion of asset purchases increase the probability of an untoward financial markets outcome by more than, and in my example, 7 percentage points? I would say that there are many people around this table who know more about financial stability and instability than I do, but for me, it would be very hard right now to answer this question in the affirmative. A 7 percentage point increase in the risk of a sharp rise in unemployment may not sound like much, but it's just huge relative to the baseline outlook.

The Survey of Professional Forecasters' average estimate is that there is less than a 2 percent chance of the unemployment rate being above 10 percent in 2014, and that's for any reason. To say that a 20 basis point fall in the term premium could trigger a 7 percentage point

increase in the probability of a financial instability event that would push unemployment up to 10 percent is at least 10 times too large relative to what I would find plausible, and it might be closer to 100 times too large, but it's in that ballpark.

So I think it would be useful for staff members to use their financial stability analysis to provide some guidance on these kinds of questions. Now, I absolutely want to be clear. My goal is not to produce a discussion with some false sense of precision. And I say “false” based on the current state of our theoretical and empirical knowledge. It would have to be a false sense of precision, where the staff tells us the probability of a destabilizing financial market outcome to three decimal places. My goal is to use the financial stability report to provide some guidance on orders of magnitude. Suppose policymakers want to consider a monetary policy change that reduces the baseline outlook for the unemployment rate by 20 basis points. Will that monetary policy change increase the probability of a large rise in the unemployment rate by something like 1 in 1,000, 1 in 100, or 1 in 10? Ultimately, these rough estimates could be translated into some kinds of color-coded signals—green, yellow, red—that would broadly capture the current relevance of financial stability concerns for monetary policymakers.

Now, my proposed framework has a lot of rough edges. In particular, the first-order approximation I described—I think you'd want to flesh it out using the quadratic objective, which informs more of the analysis the staff does. But it has the potential to make our conversation about financial stability more productive. My point is that superficially mandate-consistent monetary policy might turn out to have risks for inflation and unemployment, and as President George urged in her speech in January, those risks do deserve our serious attention. The only way that I know how to get serious about those risks is to make some quantitative

attempt to assess the risks of continued monetary policy action against the cost of inaction.

Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. President Evans.

MR. EVANS. Thank you, Mr. Chairman. I had some similar reactions. Like President Kocherlakota just now, I had not weighed in on these interventions, either, and I think I'm building quite a deferred asset. I won't draw down completely, either. But also, I thought what President Kocherlakota just did was to have a very constructive suggestion about how to tie in the links between financial stability and market risks with the macro environment and things like that. My own take on this is going to be much more conjectural than simply asking a question or two, but I think there's a lot of similarity. And the financial stability discussion just has a different feel. If I were to pose this as a question, it would be along the lines of, how should I think about our financial stability briefings and discussions and their interaction with our monetary policy goals? I've become deeply confused by recent calls to alter our policy tools and objectives in order to rein in financial stability risks. As someone who feels as though he has a pretty good grasp of how our monetary theories are supposed to inform our Committee discussions and actions, I just have to state that this is a paradox that these new financial stability objectives seem to walk right into, and I'm not sure how to address this without raising this question and this comment. And, frankly, if we're going to have this discussion, a lot of this comes down to, how effective are our regulatory tools at curbing these risks? Because if we're going to talk about using monetary policy tools in light of weaknesses in the regulatory tools, we'd have to make some assessment there, or somebody would have to offer us a judgment there.

So let me state this. We've been receiving these quarterly financial stability reports for about two years now, with an opportunity for comments. For practically all of that time, I thought our Committee discussion was about two issues. We were assessing the more exotic financial market developments beyond the Tealbook analyses, and we were judging the adequacy and effectiveness of various macroprudential policies to stem financial instability developments that might adversely affect growth and inflation, although I know that's not our remit. But now we're deep into policy discussions that seem premised on the idea that macroprudential policies alone are inadequate to meet financial stability goals in a low interest rate environment. And a lot of the commentary is about low interest rates, not just LSAP implications for our later discussions today. Much of the discussion of these markets raises flags about payment-in-kind bonds, agency REITs, CLOs, ETFs, and all manner of ways that financial people can take hard-to-observe risks. The implication of the macroprudential inadequacy assumption is that our best monetary policy settings for meeting our dual mandate responsibilities may need to be degraded with respect to our employment and price stability goals—and that's the tradeoff that President Kocheerlakota was just alluding to. That is, we may need to raise the funds rate sooner and prematurely in order to offset missing on our financial stability goals and to address weaknesses of our tools.

I just don't see how we can coherently embrace these alternative policy approaches until we resolve what I call the paradox of low interest rates. So here's the paradox: Low and stable interest rates are intrinsically dangerous from a financial stability standpoint owing to the complex set of financial products that are traded now. But low and stable interest rates currently are beneficial, if not essential, from our macroeconomic and monetary policy understanding of the economy. The financial stability argument is that without these regulatory safeguards, low

interest rates can lead to excessive risk-taking on the part of many investors. With near-zero borrowing costs, leverage further amplifies these risks. Much of this occurs through levered carry trades. These appear less risky because of low volatility in short-term interest rates. So a tentative, partial-equilibrium conclusion is that low and stable short-term interest rates are dangerous for financial stability. According to this line of argument, higher and more-volatile short-term interest rates would be better to increase financial stability. I have no idea how high that should be or how volatile it should be. And at the moment, this is a partial-equilibrium conclusion because it's not clear that the beneficial implication for financial market outcomes survives a macroeconomic general-equilibrium analysis. For example, if higher interest rates tank the economy and reduce inflation further below our objective, that's unlikely to be a good outcome for financial stability. And I think President Rosengren was talking about that in his comments just now.

This sets up an enormous paradox. A bedrock principle of modern central banking is that both low and stable inflation and, hence, low and stable interest rates provide the best outcomes for society. Milton Friedman's famous optimal rule for inflation established that safe short-term interest rates should be zero. Modern central banks have shied away from pure Friedman rules for operational concerns like the zero lower bound, but the intuition for low and stable inflation comes from this same style of general-equilibrium analysis. Another fundamental monetary principle is that when faced with shortfalls in aggregate demand, more-accommodative policies will produce better macroeconomic outcomes. To think seriously about stepping away from what would otherwise be optimal monetary policy, we need quantitative analysis with robust predictions, not just vague worries about developments that might possibly be taking place somewhere below the surface. Again, those are the complications of Narayana's calculations

that he was alluding to. So here's the danger: Unless we have an understanding of these paradoxical interactions between financial stability and optimal monetary policy, we're flying blind to suddenly overrule the basis for almost all of our fundamental monetary beliefs about the economy and inflation. If we choose to contradict our past monetary tenets because of these partial-equilibrium financial analyses, how can we be sure which other tenets are to be retained? Logically, it's not at all obvious. We're deeply into a theory of the second-best, which turns other policies that previously are to be discarded on their head, and those policies might be best to control it. We really don't know where this path leads us.

Now, I am most assuredly not saying that financial instability concerns are irrelevant for our economy and financial system. Our best understanding of the underlying causes for excessive and leveraged risk-taking comes from agency problems and inadequate delegation and monitoring. In addition, our financial system has grown to be extraordinarily complex. Rather than weakening our best monetary tools that are intended to reduce resource imbalances and inflationary pressures, I'd like to know one heck of a lot more about our ability to address those agency and delegation issues through separate supervisory tools. Indeed, if you accept the new approach that financial stability requires higher interest rates, a likely corollary to the financial stability dilemma posed here must be—should be—that we have allowed complex financial products to be traded that have negative social value. It's almost a QED proposition, since our previously-optimal monetary policies are now severely reduced in capability owing to the need to offset financial instability concerns. If one truly believes that financial stability requires interest rates so high that the economy must operate below its potential and suffer unemployment above the natural rate, then I think one would need to be out campaigning for big changes to the financial system—a lot more rules, a lot more capital, and maybe even fewer financial market

products. So, unless we unravel and understand the paradox of low and stable interest rates, it seems dangerous to limit ourselves to too few policy tools for addressing monetary and financial policy. But this is the setting for these discussions, and I just am really perplexed and don't know how to proceed unless we have discussions about that. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. Governor Powell.

MR. POWELL. Thank you, Mr. Chairman. Let me see. I don't have answers to those very interesting and difficult questions, but I do have a little bit of data that I would quickly share with the group. I met last week with a group of about 75 very large mostly fixed-income managers, including pension fund managers, endowments, insurance companies, and traditional money market managers. And they filled out a detailed survey of their own design and presented the results, which I forwarded to Nellie and will share very briefly with you. I'll use their exact words and questions so as to avoid editorialization, although I freely admit to a bit of selection bias. Sixty-four percent of them feel that "it is appropriate for the Federal Reserve to be very accommodative" but question "the need, effectiveness, and/or risks of ongoing quantitative easing"—their words. Seventy-four percent are "concerned about exit" and said that "the larger the balance sheet gets, the bigger the exit strategy risk." Sixty-four percent say that "the Fed is luring people into investments that may not really make sense to them." When asked which asset classes they would characterize as "artificially influenced by the Fed's actions," 84 percent identified high-yield bonds, and 80 percent U.S. Treasuries. As far as expectations are concerned, 56 percent say that "the Fed will not begin to taper purchases until 2014." Ninety-two percent say that "the Fed will not stop purchases until 2014 at the earliest," and 45 percent expect that "the exit will not involve the sale of securities." Then I had an hour or more of discussion with them, and I would say it's a mixed picture. These are very sophisticated

investors, for the most part. The main concern that comes through is the one that we'll be discussing, and that is a disruptive event around exit. There is support generally for accommodative policy, but concern that the longer it goes on, the more difficult the exit may be. That's what I have. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. Any other comments in this go-round? [No response] Well, would we like to begin the economic go-round, or do people want to have lunch first?

VICE CHAIRMAN DUDLEY. I think we can get started.

CHAIRMAN BERNANKE. Get started. Okay. Why don't we—maybe for half an hour or so, we can begin our go-round. Okay?

VICE CHAIRMAN DUDLEY. Let's go a little further. We've got a long afternoon.

CHAIRMAN BERNANKE. Let's do half an hour, and then we'll go to lunch. All right? Let's go to our economic go-round, and I will call on President Rosengren.

MR. ROSENGREN. Thank you, Mr. Chairman. My economic outlook is similar to my previous SEP forecast. While the incoming data have been somewhat more positive than I anticipated, the sequester was an unpleasant surprise. The net of these two influences leaves my forecast from the last SEP relatively unchanged.

Comparing my forecast with that of the Tealbook, the primary difference is in the monetary policy assumption. The Tealbook assumes that purchases stop in June when the unemployment rate is 7.7 percent, and, as a result, the unemployment rate falls quite slowly and is still 7½ percent at the end of the year. I assume purchases continue through the year, which helps lower the unemployment rate to 7¼ percent by the end of the year. Like the Tealbook, I

expect the PCE price index to remain well below our 2 percent target throughout the forecast period, even though I am assuming more accommodative monetary policy.

For some, the difference between an unemployment rate of 7½ percent versus 7¼ percent at the end of this year may seem trivial. However, that translates into a little less than 400,000 jobs that people will have at the end of this year that they will not have if we do not continue our purchase program through the end of this year. Some research by Boston staff highlights why we should care about those 400,000 people. While it is well established that spells of unemployment have a significant negative impact on labor income for years, recent Boston staff work using PSID data has examined the impact of long-duration unemployment on future labor income. Their research finds that 10 years after a spell of unemployment, an individual, on average, makes 16 percent less than an individual that did not experience that spell of unemployment. However, if that unemployment spell lasted more than six months, 10 years after that spell of unemployment, the individual is making roughly 36 percent less than the individual that did not experience a spell of unemployment. After 20 years, the individual earnings of the short-duration unemployed are roughly the same as those without a spell of unemployment. But the individual with a long-duration spell of unemployment is still somewhat worse off. Furthermore, there is no catch-up for the years of lost income. Not surprisingly, those lost opportunities result in unfavorable collateral effects. For example, spells of unemployment significantly negatively impact future homeownership rates, and those that experience a period of long-duration unemployment have a significant permanent loss in wealth.

It is important to emphasize that one cannot perfectly distinguish between extended unemployment spells that result from sorting in the labor market such that less-productive workers are the first unemployed and the last to find new jobs, versus bad luck on the part of

productive employees whose firms have failed or not performed well. But one only needs to assume that a modest portion of those long-duration unemployment spells reflect the bad luck case to arrive at a sizable long-run impact of extended unemployment.

Clearly, if we can get faster economic growth, both the incidence of unemployment and the duration of unemployment that are the focus of this study would be reduced. Over the past six months, I have met with a wide variety of economists from around New England to discuss monetary policy actions. Not one has said that there is no impact of our LSAP program, though the amount of stimulus and potential collateral impacts are much more debatable. When I have had bankers in to discuss the economy over the past six weeks, no banker debated that housing and auto sales have been helped by our action, though they do debate the impact on their margins and industry profitability.

When I hear a speech that impacts the probability that markets assign to extension or reduction in the LSAP program, I see market movements in the stock market and bond prices that analysts attribute to the speech, and, thus, to the impact of our likely actions. Clearly, the market view is that our actions have an economic impact.

When I read the staff studies at the Board, and by economists in my bank, there is certainly a debate about the size of the impact of the LSAPs, but not whether they have any impact at all. While the economy has improved despite fiscal actions, and partly as a result of our monetary policy actions, we do not have the kind of self-sustaining recovery that will quickly return us to either of the targets we have been assigned.

My forecast is that even with more aggressive monetary policy action than assumed in the Tealbook and assuming no significant adverse shock from fiscal policy or risks from abroad, two years from now PCE inflation will still be below our target, and unemployment will be far

from my estimate of full employment. I look forward to our next go-round where we will discuss more fully the costs and benefits of the LSAP program.

CHAIRMAN BERNANKE. Thank you. President Evans.

MR. EVANS. Thank you, Mr. Chairman. Although my staff has adjusted several elements of our outlook, the basic story is not very different from our last meeting. We still envision 2013 growth of about 2½ percent, and it should pick up to 3½ percent next year as headwinds abate and the recovery gains momentum.

Storylines for the headwinds and stronger fundamentals are quite familiar. On the downside, there is weak global growth and U.S. fiscal restraint. My contacts also frequently say that regulatory factors likely contribute to the drag—factors such as enhanced capital requirements, stronger supervision across financial institutions, and requiring higher average levels of health-care provision. On the upside, we have accommodative monetary policy and improving private balance sheet conditions, a housing turnaround that should continue to gain strength in 2014, pent-up demand for consumer durables, and the eventual need for capacity retooling and expansion. I continue to hear reports that our accommodative policies are having positive effects. For instance, the automakers see substantial beneficial effects from low interest rates. They expect low rates to continue to support further strength in sales.

On the financial side, my banking directors cited substantial refinancing activity generated by lower rates. The refi pickup should further boost consumer spending. Financial participants also commented that businesses are continuing to take advantage of lower rates to reduce their debt service. Indeed, two weeks ago, our CDIAAC bankers grumbled that larger regional bankers were entering their territory and forcing them to reduce rates below their planned rate floors. They turned to me and asked, “Don’t you care about community banks?”

Can the record reflect that I am looking thankfully at Governor Duke? [Laughter] She is the founder of the CDIAC program, for those of you not involved in it. I said I supported a level playing field, but after that, competition and cost-based pricing is what our market system is supposed to deliver. I could go on, but in the interest of time the record should reflect that our policies continue to provide effective financial support for greater demand and economic activity.

All this said, we still need to avoid becoming overly complacent about these signs of improvement. Indeed, my business contacts this round were much better at describing the headwinds that they faced than the factors that would push them to ramp up activity.

There were also some decidedly downbeat reports. In particular, two large equipment manufacturers headquartered in my District have become increasingly concerned that the economic outlook is moving in the wrong direction. Since last fall, Caterpillar has been engaging in rolling furloughs of thousands of workers on their U.S. production staff about one week each month. Now they are expanding these layoffs to more employees and are planning to do the same for white-collar staff. Similarly, Deere says that, except for agricultural equipment, all of their business segments are moving into negative territory on a year-over-year basis. Sales of construction-related equipment have fallen way off for both companies. They had expected to see much more activity this year. Other comments from a variety of CEOs reinforce these two negative domestic risk storylines, suggesting continued and perhaps broader increases in conservative attitudes toward growth prospects.

The international picture isn't rosy either. Sort of like Steve Kamin's tepid numbers in China, one CEO said that earlier promises of improved conditions in China, notably from public

infrastructure projects, were not being borne out by the incoming numbers. And several thought that the outlook for other emerging market economies was mixed at best.

More generally, most optimistic reports for a better business environment in 2013 reflected expectations for a better second half as opposed to increases that already are in train. For me, all of the stories about economic growth being backloaded seem like the first step toward firms backtracking on their outlook and commitments for the year as a whole. That is not my forecast today, but it continues to be a risk.

I am also concerned about the inflation outlook. That is, I am concerned that inflation will continue to run too low for too long. The latest year-over-year core PCE inflation number is down to 1.3 percent, which I think deserves our notice. In fact, alternative B says inflation has been running somewhat below the Committee's longer-run objective. At 1.3 percent year over year, I don't know—that might be more than "somewhat." The trends in the data are consistent with the fact that I am hearing virtually nothing from business contacts about price pressures. Even if we get some firmer wage increases, labor share is very low, so that firms' margins are higher than normal. Accordingly, there is little reason to expect full pass-through into prices.

Regarding assumptions underpinning my outlook, our monetary policy assessment challenges are unlikely to be clarified anytime soon. The need for accommodation in my forecast remains strong. Unemployment is high relative to sustainable rates, and the inflation outlook over the next year is well below our 2 percent long-run target. If the Tealbook is right, at midyear we will be looking at a choppy first half of the year in which growth won't average much above potential. That leaves us pinning our hopes on a second half that comes in around $2\frac{3}{4}$ percent. I've got a forecast that is like that, too, but we are backloading the growth, and we know that over the last several years we had similar forecasts. I think this is a reasonable point

forecast, but it is uncertain. And even if things evolve as we expect, we will be sitting here in June with a weaker-than-potential expectation for second-quarter growth. It is hard to imagine we will have a whole lot of confidence in our outlook for a substantial improvement in labor market conditions. And if we have curtailed our open-ended LSAP program prior to labor market improvements, that will be a negative policy impulse for the economy going forward, maybe a big one. I really don't have much confidence in sizing up that negative policy impulse.

Also, looking out further, we need to remember that our forward-guidance markers are thresholds. Six and a half percent unemployment is not a trigger. The Tealbook has unemployment reaching 6½ percent late in 2015 at a time when PCE inflation is running 1.6 percent. At that point, I think a true threshold implementation of our forward guidance will call for continued delay in changing the funds rate.

And, hypothetically, if we have abandoned our LSAPs earlier by citing lack of efficacy or vague, higher costs prior to substantial improvement in labor markets, I don't see how LSAPs can ever be used again during this monetary cycle. After all, nobody talks about bringing back the ineffective cavalry to fight our 21st century battles these days. So if we don't have those weapons at our disposal, we are going to have to hope for other things. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. President Pianalto.

MS. PIANALTO. Thank you, Mr. Chairman. Much of the recent news on the economy has been somewhat encouraging. Consumers appear to be taking the payroll tax increase in stride as consumer spending is growing modestly despite large monthly fluctuations in disposable income. Businesses also appear to be turning a bit more optimistic. The manufacturing and nonmanufacturing ISM indexes have firmed in the last few months, and

orders of core capital goods are once again above shipments. The contacts in my District report being pleasantly surprised by orders and their activity levels so far this year.

Perhaps the best news has been on the labor market. Employment gains have essentially averaged 200,000 per month over the past five months, reflecting both an acceleration in initially reported job gains and revisions to prior data releases. This pace is certainly better than I was expecting back in December.

Reflecting these circumstances, my outlook for GDP growth would have clearly improved if not for the onset of sequestration. The additional fiscal tightening that sequestration brings will pose a headwind to growth in coming quarters, offsetting some of the momentum the private sector seems to have gained in recent months. As a result, on net, I expect GDP growth of about 2½ percent this year and nearly 3 percent next year. These figures represent a little slower growth than I projected at the January meeting when I was more hopeful about fiscal policy.

Reflecting these same forces, my forecast for the unemployment rate hasn't changed much since the last meeting, but it is two-tenths lower than it was at the time of our December SEP. This is a small change, but the public will see some progress on our SEP submissions for unemployment. Nonetheless, I continue to expect only gradual progress on unemployment, with the unemployment rate reaching 6½ percent in late 2015.

Even though my outlook for labor markets has improved, the question is whether the improvement is substantial. Unfortunately, this isn't an easy question to answer. A key challenge is that the labor market has become less dynamic over the past decade. As I've noted in some of our past meetings, my staff uses a model that accounts for a labor market that was already becoming less dynamic even before the recession. They use this model to forecast the

unemployment rate and to estimate the natural rate of unemployment. Their analysis focuses on trend rates of job finding and job loss, which have both declined over the past decade, and this analysis produces a natural rate of unemployment that they estimate to be about 6 percent.

For this meeting, they also ran some simulations to see what this recovery's job flow rate implied for the pace of job gains that we should currently expect. With a reduction in the output gap similar to the Tealbook's estimate for 2013, which is 0.6 percentage point, my staff's model implies that we should expect to see job gains under 150,000 per month this year, followed by a year of gains over 200,000 jobs per month. The result of this path of job gains is a gradual decline in the unemployment rate reaching 6½ percent midway through 2015. With employment gains averaging essentially 200,000 per month over the past five months, I think we're off to a good start. For comparison, in the more dynamic 1980s labor market, for a similar-size starting output gap, the model would have predicted employment gains of more than 300,000 per month and, therefore, a faster convergence to the natural rate. While these results are preliminary, and they're model dependent, I do think that this flow-based approach is helpful when we think about rates of progress in labor markets. While any definition of substantial improvement will remain in the eye of the beholder, an average rate of 200,000 jobs per month looks to me to be a useful benchmark for substantial improvement in our outlook for the labor markets, as other FOMC members have suggested.

Regarding inflation, PCE inflation has been running consistently below our 2 percent long-run objective. However, there are several reasons to think that future inflation will be closer to our long-run objective. First, the trimmed mean CPI and the median CPI have been more stable and are running close to 2 percent. Second, the chain-weighted core CPI, which is a closer concept to the PCE measures than are other CPI measures, shows inflation to be stable at

about 1¾ percent. Third, inflation expectations remain well anchored, and significantly, recovery in labor markets will gradually push wage growth back toward historical norms, helping to return our inflation rate to closer to our objective. Combining these factors, my inflation outlook remains close to our 2 percent objective throughout the forecast horizon.

Given the ongoing fiscal issues, my assessment of the risk to the outlook remains primarily to the downside for GDP growth and, despite the recent progress on unemployment, I am still concerned about some misses to the upside on unemployment. On inflation, I see the risks as broadly balanced as inflation expectations continue to be well anchored. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. President Fisher.

MR. FISHER. Thank you, Mr. Chairman. I'm going to comment briefly on the region, make some comments on the data we've seen nationally, report as I always do on my corporate contacts, and then I want to make a comment on inflation and perhaps on the financial markets.

Very quickly, with regard to our region, you could say that in Texas, which dominates 98 percent of my District, our employment performance for 2012 was stronger than we expected, about 3.1 percent employment growth. That's the highest we've reported since 2007. We had a sluggish January, but, going forward the next 11 months, we expect to have a growth rate of about 2½ percent. So we continue to grow rather handsomely.

Of concern to us is the tightness of the housing market statewide, and, in fact, our housing inventory is running at 3.2 months Districtwide. That's the lowest since 1990, and we're beginning to see significant price pressures there concentrated heavily in the \$200,000-and-less home price category.

With regard to the national outlook, I agree with David Wilcox and his presentation. The outlook is better than we anticipated. The housing market and housing starts are stronger, which is not unimportant. Manufacturing is stronger. Retail is performing rather well. You have to remember that in looking at first-quarter retail numbers, we had a pretty high hurdle in terms of the first quarter of 2012, and yet the year-over-year numbers in most income quartiles look fairly healthy.

As far as the rails are concerned, anecdotal evidence tells us they're running about 85 percent of their 2006 peak load factors, driven heavily by transporting oil, having dropped off on coal. Across the board, their load factors seem to be on track to come back to the levels they had in 2006 by about 2014, if you just extrapolate the current activity.

And with regard to the telcos, which I like to look at, if you look at their data, their performance with consumers—which are fixed-line hookups as well as portable telephonic devices—and with small business is running very strong as opposed to with the large corporate customers. I did check with one of them, the CEO of AT&T, and he said it was the best consumer and small business demand he had seen in over 20 years. I take that to be encouraging.

Now, Moody's just released their survey of U.S. nonfinancial companies' cash holdings. We talked about that a bit. It was reported in this morning's *Wall Street Journal*. According to that survey, nonfinancial companies hold \$1.45 trillion in cash, which is roughly 9 percent of GDP at the end of 2012, up 10 percent year over year, and up 77 percent from 2006, pre-crisis. The report, or at least the summary that I read, says that capital spending and dividends rose in 2012. I don't think any of us thought the capital spending numbers were robust enough, and spending on buybacks and acquisitions declined year over year because 2011 was a pretty active

year. Moody's does estimate that \$840 billion, or 58 percent of the \$1.45 trillion in cash, is held overseas. So having had a little glimpse of that report before it was released, I did probe that with my business contacts and, with my usual "for what it's worth" caveat, here's what I hear them saying presently. I had a pretty good round this time. I think I talked to 36 CEOs and 1 CFO of companies of all sizes and in all different sectors.

Again, for what it's worth, the sequester issue to most of them, unless they're in the defense and the medical delivery areas, is a nonevent. To quote more than one, they're tired of "The Boy Who Cried Wolf" in Washington, and they're not just referring to the executive but also to the members of the Congress, and they just decided basically to manage through it.

They're still driving for productivity, but payroll reduction and redundancy appear to be near an end. I find this actually encouraging. Several of them were saying that they had warehoused remaining workforce in Skunk Works and other areas—just to use an old-fashioned term—but they basically decided to push those folks out and just focus on what they do best. I actually find that encouraging. We may be—and I underscore the word "may"—at the end of the redundancy cycle. But having said that, and I think this is in keeping with what others have reported, there still is a great reluctance to add significantly to payrolls. Part of this has to do with uncertainty associated with cost regulations, health care, et cetera, and of course a great deal is due to caution regarding future demand. I think there's a little reluctance for a cat to sit on the hot stove twice. They want to be very, very cautious and will continue to do so going forward.

I am hearing, for the first time, something a little bit different with regard to the use of balance sheets. I referred earlier to the Moody's report, and I describe it as a defensive use of balance sheets. We've seen firms re-gear themselves, obviously assisted by lower rates and robust credit markets, and they've been using these stronger balance sheets in a defensive sense

to buy back shares, to increase their cash dividends, and to maybe fix up their pension funds. But I'm beginning again to hear a little about the offensive use of balance sheets—that is, it is dawning on them that there may be the potential to expand through acquisition. But what is disappointing is, not much in the United States where things are richly priced. But the good news, Steve, may be that most of the CEOs that I speak to that operate globally find Europe to be an incredible bargain. There is a capital shortage in Europe. Those that have the means are for the first time actively thinking about deploying that substantial amount of money held overseas to buy things cheaply, and that may provide a bit of a floor. I'm not quite sure, but I think it's encouraging.

With regard to inflation, I'll just quote exactly what Tim Cook, who is the CEO of Apple, mentioned to me after a meeting with a group of his colleagues. He believes that unless we start tapering, we are laying the ground for the “mother of all inflation.” It disturbs me that we are beginning to hear more and more of this in the corporate sector. It may mean that we just have to improve our communications. As President Pianalto pointed out earlier, our trimmed mean numbers are higher than the core number that Charlie reported, but still, the 12-month run rate for the Dallas Fed trimmed mean is 1½ percent.

We can talk about this later, but I'm a little concerned reading through the memos when I see terms like “fiscal benefits of higher inflation.” If I may, I'm going to quote an unusual source—Zhou Xiaochuan, the governor of the Bank of China, from last week: “In the past, some of us thought it was no big deal if inflation was a little bit high—growth will be a little faster and then we can control inflation afterwards. But international experience and our own experience here show that this thinking might not be correct. It requires careful attention to maintain low

inflation.” Well, Zhou is a communist and doesn’t believe in God. I’m a Presbyterian, and I do, but I join him in saying “amen” to that sentiment. [Laughter] Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. A global-communist-Presbyterian conspiracy. [Laughter] President Bullard.

MR. BULLARD. Thank you, Mr. Chairman. The Eighth District economy has expanded at a moderate pace during the intermeeting period. The District’s unemployment rate measured across 16 MSAs continues to run below the national average in the most recent data. Both anecdotal reports and hard data seem to indicate that the District’s housing markets are markedly improved compared with one year ago. The implementation of new health-care laws is consuming a large measure of time and attention for many businesses in the District.

The District’s community bankers continue to report apprehension over new regulation, compressed margins, and heavy competition for high-quality loan customers. District contacts tended, on balance, to downplay any concerted effects from the increase in the payroll tax, which took effect at the beginning of the current quarter. District agribusiness seems to be optimistic for another excellent year. Some large businesses in the District suggested that 2013 to date has been the best beginning to a year of any in recent memory.

Businesses with global reach felt that adjustments to the recession in Europe and to slower growth in emerging markets were made in 2012 and so now are in the past, and that their businesses are poised for profitability in 2013. One important firm reported a near tripling of capital spending for 2013 versus 2012. Others with substantial cash may be considering especially large investments.

These anecdotal reports seem to me to be consistent with an economy that faces far less global and domestic uncertainty than appeared to be the case one year ago. Last year, political

turnover in the U.S. was a live possibility. The European sovereign debt crisis was causing substantial global volatility. Europe was falling into recession. Emerging market economies were slowing. Further upheaval in U.S. health-care laws seemed like a possibility, and negotiations over the fiscal future of the country pointed toward brinksmanship. Financial markets and business leaders in general dislike these types of uncertainties. They tend to recoil from key decisions, reasoning that many decisions can wait until some or all of the uncertainty has been resolved. I definitely heard repeatedly in the past year from many business leaders that they did not feel they had enough clarity on their business outlook to proceed with major investments.

However, in 2013, a sea change has occurred. The uncertainty aspect has been greatly reduced. The political situation in the U.S. has settled down. The European sovereign debt crisis, despite recent wrangling over the Cypriot aid package, has been relatively calm due to the ECB's Outright Monetary Transactions program. This program has created what I last year regarded as an unlikely equilibrium in Europe, at least for the time being, as the option for countries to apply to the OMT under strict conditions has reduced sovereign debt yields in key countries and eased the crisis atmosphere. From the U.S. perspective, it is the reduction in the probability of a full-blown crisis that is the key factor. While Europe remains in recession, I expect the situation with respect to the real economy to stabilize in 2013.

Finally, emerging markets slowed in 2012, partly in sympathy with European developments, but now seem poised for a better year in 2013, as we heard earlier from our staff report. The reduction in global uncertainty has changed the calculus for U.S. businesses and households, and increased the odds that a more typical pace of economic growth will take hold in

the U.S. during 2013. U.S. equity markets seem to be anticipating this effect and, to some extent, corroborate this narrative.

Accordingly, my forecast has real GDP growth at about 3 percent this year and 3.2 percent in 2014. I see more growth somewhat sooner than the current baseline in the Tealbook. I anticipate unemployment continuing to tick down as the economy improves. The unemployment rate has fallen at an average pace of about two-tenths per quarter during the past three years, a period in which real GDP growth averaged 1.8 percent at a seasonally adjusted annual rate. I see the unemployment rate possibly declining faster in an economy with somewhat faster, but still not stellar, growth. I do not think that labor force dropouts are likely to return to the labor force unless the unemployment rate falls to much lower levels.

I also see monetary policy as particularly accommodative at this juncture. I see outright asset purchases as perhaps somewhat clumsy but still more potent than our Operation Twist programs. I also see state-contingent forward guidance as more effective than the date-based forward guidance previously in use. The more-potent monetary policy combined with the improved outlook has caused me to expect more inflation over the forecast horizon than previously. I now see 2013 inflation at 1.6 percent, rising to 2.1 percent for 2014 and 2.6 percent for 2015. This is despite the incorporation of a somewhat more aggressive exit strategy in my forecast than in the Tealbook baseline.

Finally, I want to just make a brief remark on financial stability and macro following up on the very interesting comments of Presidents Kocherlakota and Evans on this matter. I think there's no doubt about it: We need better models that, above all, admit the possibility of crisis within the model, and we don't have models that are like that. We have models where everything works smoothly all the time and things always return to normal steady states. I do not

think that we can freely accept policy advice from models that do not have this incorporated these days, given all that has happened over the past five years. If you have a model that has the possibility of financial crisis included, then within that framework you can examine optimal monetary policy and optimal macroprudential policy jointly, and you can come to some kind of conclusion.

Since we don't have good models of this type, obviously we're going to have to make judgments in the near term. However, I was encouraged at the San Francisco Fed conference. There was a paper by Frank Smets. Many of you know he is a researcher at the ECB where they actually did have a financial crisis embedded in the model. Then you could more coherently talk about what the best monetary policy was and what the best way to mitigate the possibility of financial crisis was within that framework. I thought that was an encouraging step in the right direction, and I look forward to seeing more research in that direction. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. Let's finish this session with President Plosser.

MR. PLOSSER. Thank you, Mr. Chairman. The Third District economy continues to expand at a modest pace. Staff coincident indicators for our three states rose for the three months ending in January, and our leading state indexes were positive in January. Employment is improved at the end of 2012 and in January, but unemployment rates remain elevated.

Recovery in construction and the real estate sector is expected to accelerate in 2013. This partly reflects building needs in the wake of Hurricane Sandy, the repurposing of three refineries in the region, and continued steady growth in residential construction. Home prices, as measured by the CoreLogic Index, rose significantly in Pennsylvania and New Jersey in January.

One of my business contacts, the CEO of a large nationwide builder of medium- to high-end homes, is euphoric. Not only is sales growth expanding rapidly, he is raising prices rapidly. He also reports that some areas are booming, which are his words, not mine, including New York, California, and Texas. In his view, the weakest region of the nation for housing is in and around the Chicago area. Sorry, Charlie. [Laughter]

Retail sales in the region have been improving since the start of the year. Auto sales have been particularly strong, and at least some of that strength is in New Jersey and may be reflecting the replacement for otherwise drowned cars in Hurricane Sandy.

We saw an improvement in our regional manufacturing survey this month. The data, which are confidential until Thursday morning at 10:00 a.m., indicate that the general activity index rebounded to a plus 2 from a minus 12 last month, which is a significant move for that index. New orders, shipments, employment—all improved, all at positive levels, but relatively low levels. Expectations for the future remain bright. Manufacturers continue to expect activity to pick up over the next six months, with the indexes of future activity, new orders, and shipments solidly in positive territory.

The direct and indirect fiscal effects of sequestration on the Third District are expected to be relatively small, generally less, probably, than other states. More generally, my economic outlook for the nation is basically the same as it was in December and in January. But the continued string of better data makes me a tad more confident. Incoming data confirm that the pause in the fourth quarter was just that, a pause. The data received since then have come in on the high side of many analysts' expectations. Thus far, the rise in payroll taxes has been less of a drag on spending than some feared, at least so far, as retail sales have held up quite well in January.

I believe that the fiscal multiplier is probably less than 1, unlike many models, so I don't anticipate the sequester will have a substantial effect on growth. Improvement in housing and increases in house prices will help consumers as they continue the deleveraging process. I expect the drag from deleveraging will continue to fade as the economy improves.

I anticipate the economy will grow about 3 percent over the next two years before reverting to trend, which I believe is about 2½ percent in 2015. With this pace of growth, I think job growth will steadily grow, and we'll have a gradual decline in the unemployment rate. My forecast is that the unemployment rate will fall to near 7 percent by the end of 2013 and to 6 percent by the end of 2015. Is this path more optimistic than the Tealbook and most others? Yes, it is, I have to admit. Is it overly optimistic? I don't think so.

As President Bullard pointed out, the average decline over the past three years in the unemployment rate has been about 0.2 percentage point a quarter. And if you just extrapolate that rate of decrease in the unemployment rate that we have had for the past two years for this year, you get something close to 7 percent by the end of this year. I would also note, as has been noted, that the gains in employment over the past four months have been over 200,000 jobs a month. And since September, when we did our QE3, unemployment has fallen from 8.1 percent to 7.7 percent.

Inflation and inflation expectations remain contained for the moment. But given the expected trajectory of monetary policy, I believe there is upside risk to inflation over the medium to longer term. And that risk I see as rising with the size of our balance sheet. To maintain price stability as the recovery takes hold, I believe the FOMC will need to begin the process of reversing the ever-increasing policy accommodation sooner than the Tealbook. And based on my forecast and my assessment of the costs and benefits of LSAPs, which we will discuss in the

next go-round, I would like to see us begin tapering asset purchases with an aim to ending them before the end of this year. In my view, the benefits of our highly accommodative policy and stance are outweighed by potential costs. The costs include financial stability, political risk to the Fed's independence, and complications to our exit strategy that may jeopardize the achievement of price stability.

I remain concerned that if we wait until our outlook for medium-term inflation has moved too high, we will be behind the curve. With \$1.6 trillion in excess reserves, the potential consequences for inflation of us getting our exit strategy wrong could be quite high. Put another way, given the size of our balance sheet, small errors in our exit will have large, negative consequences, and more so this time than in the past because of the size of the balance sheet. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. Okay. Lunch is available. Why don't we recommence at 1:30.

[Lunch recess]

CHAIRMAN BERNANKE. Let's recommence our economic go-round. I have President Williams.

MR. WILLIAMS. Thank you, Mr. Chairman. The economic recovery has survived remarkably well so far this year, despite being shot in the foot by fiscal policy. Household spending, business investment, and the labor market have all strengthened, even with year-end tax increases and the looming effects of sequestration. Indeed, with car sales hitting post-recession highs, I am hoping that President Rosengren has finally taken the plunge and replaced that old Ford Escort he mentioned at our last meeting.

Absent the sequester, I would have marked up my 2013 real GDP growth outlook by a tenth or two. Unfortunately, most, if not all, of the sequester cuts appear likely to remain in place. Therefore, I expect real GDP will grow 2.4 percent this year, about $\frac{1}{4}$ percentage point less than at our last meeting. More generally, my forecast is quite similar to that of the Tealbook.

Many of my contacts tell a similar story of sequester worries amid a still-tentative recovery. Those in residential and commercial real estate and related industries are generally upbeat. For example, a window manufacturer and a furniture retailer both say they are seeing much stronger sales than anticipated. But outside of real estate, most business people I talk to remain cautious in the face of fiscal headwinds and continuing economic uncertainty.

People in a range of industries describe a nagging sense of anxiety about sequestration. Much of it centers on the potential effects on demand, although supply—such as possible delays in food or customs inspections—is an issue as well. The overriding concern, as one contact put it, is that sequestration can put the economy back into neutral. As a result, many of my contacts say they are in a wait-and-watch mode. Of course, their anxiety is not just a product of uncertainty about the future. The fact is that many businesses are dealing with the ongoing reality of weak demand.

Looking further ahead, my outlook is little changed from January. I continue to expect growth to pick up notably in early 2014, boosted by very accommodative monetary policy, including continued asset purchases well into the second half of this year. Similarly, in terms of unemployment, my outlook has not changed. Solid labor market readings have been offset by the likely effects of fiscal policy. So it is unlikely that we will reach our policy threshold of a $6\frac{1}{2}$ percent unemployment rate until the second half of 2015.

The labor market has been a source of many puzzles during this recovery. In past meetings, we have discussed the unusual rightward shift in the Beveridge curve. That is, for a given level of posted vacancies, there are more unemployed workers than in the past. Research on this issue around the System, including at the San Francisco Fed, has consistently found that temporary factors account for much of the shift. Notably, extended unemployment insurance benefits appear to have reduced the search intensity of those who are looking for work, and that has boosted the number of unemployed per vacancy. But if temporary factors shifted the Beveridge curve out, then why hasn't it shifted back as unemployment benefits have become less generous during the past two years? Indeed, despite sizable reductions in these benefits already, the position of the Beveridge curve has made little progress getting back to where it started before the recession.

Research at the San Francisco Fed has uncovered one potential explanation for why the Beveridge curve has not yet shifted back. In particular, drawing on the work of Davis, Faberman, and Haltiwanger, my staff finds evidence that an increase in policy uncertainty reduces the intensity with which businesses strive to fill posted vacancies. This reduction in recruiting intensity manifests itself as an outward shift in the Beveridge curve. Specifically, they examine how the time series of past Beveridge curve shifts reacted to policy uncertainty shocks using the standard vector autoregression model. They find that since the fall of 2009, heightened policy uncertainty has been a key factor restraining the return of the Beveridge curve. Digging a little deeper, it appears that uncertainty mostly acts to reduce firms' recruiting intensity, consistent with the findings of the research by Davis and his coauthors.

Now, these results echo the comments of my contacts, who say they are extremely cautious in adding new workers. When businesses have openings but are unsure about what the

future holds, they often postpone pulling the trigger on a new hire, but the vacancy remains posted. In essence, firms are waiting to find the perfect candidate instead of settling for applicants who are merely pretty good. It may take more than the usual number of interviews before they overcome their skittishness and convince themselves that they found the right person. Based on this research and the anecdotal reports, it appears that temporarily higher uncertainty is offsetting the effects of declining unemployment benefits on the Beveridge curve. When uncertainty recedes further and unemployment benefits return to normal, I expect that the Beveridge curve will shift back to its pre-recession position. Importantly, as I indicated in previous meetings, since heightened uncertainty affects the economy like a fall in aggregate demand, monetary policy easing can speed up this adjustment process by offsetting uncertainty's effect on the labor market.

Finally, turning to inflation, over the past 12 months, core PCE inflation came in at 1.3 percent. Total PCE inflation was 1.2 percent. And I continue to expect that both of these inflation series will run close to 1½ percent over the next few years. But I worry that we may fall even further below our 2 percent target. All of the key drivers of inflation are neutral or negative. Wage growth is weak. The dollar has appreciated. Oil and non-oil commodity prices are falling. My contacts view the retail environment as uber competitive. They bemoan their lack of pricing power and their inability to boost margins. Consistent with this view, the FRB/US risk assessment in the Tealbook puts a 43 percent chance on inflation falling below 1 percent by early next year. Given these conditions, we should be on special lookout for downside risks to inflation and signs of deflationary pressures. Thank you.

CHAIRMAN BERNANKE. Thank you. President Lockhart.

MR. LOCKHART. Thank you, Mr. Chairman. Like several others, I have not materially changed my forecast for the economy from the December submission. I have a growth path a little under the Tealbook forecast. The incoming data have been a little stronger than I anticipated in December, and the improved tenor of the data was supported by input from our directors and contacts in the most recent cycle. While these modestly upbeat indicators have not yet caused me to mark up my growth projection, they have moved me to adjust my assessment of risks to growth. Previously, I had the balance weighted mostly to the downside. In this submission, I characterize the risk as broadly balanced.

In our conversations around the Sixth District, we heard growing sentiment in the business community that the investment environment is improving, and that firms are closer to committing dollars and resources to investment projects. One contact said, “Investment ideas are coming off the white board.” We also heard mention of shortening of investment payback horizons. It is well known that larger firms have ample cash on hand, as President Fisher noted in referencing the Moody’s survey. A number of larger firms among our contacts indicated that they may apply their cash resources to market-share-oriented acquisitions. As in the past, we heard of investment appetite for productivity-enhancing technology, but we did not hear a lot about greenfield investment projects. And bankers noted that firms will draw down cash balances before borrowing, so corporate credit expansion is not immediately expected.

Outside of businesses directly impacted by expenditure cuts, the sequester does not appear to be having an impact on business decisionmaking, broadly speaking. At the same time, many employers continue to be hesitant to take actions that would involve a large number of new additional hires. We continue to hear concerns about health care and other costs that make the return on investment in an employee hard to calculate three to five years out.

Rising house sales and residential construction are among the leading factors contributing to an increasing level of confidence. A number of contacts expressed confidence that the housing recovery is real. Auto manufacturing and sales, as well as strong energy sector activity, were also cited as important contributors to a better tone of the economy.

When we asked our Atlanta directors about consumer behavior, we heard a consensus view that payroll tax and gasoline price increases have significantly cut into the spending of households earning less than about \$60,000 per year. These contacts believe there is a two-tier consumer population developing, with higher-income households ignoring these developments and expanding their consumption at a good pace, while lower-income households are forced to economize. The result is very uneven consumption growth.

On what I guess is an encouraging note, a Miami director whose family is a leading producer of rum said that people who were previously drinking at home seem now to be imbibing outside the home. Always a good sign. [Laughter]

MR. FISHER. In Eric Rosengren's car, by the way. [Laughter]

MR. LOCKHART. This director urged us literally to not take away the punchbowl. [Laughter]

Regarding inflation, wage and cost pressures remain light. I continue to consider the risk to the inflation outlook as balanced. Overall, the comments of our contacts were somewhat upbeat and encouraging. Angst seems to have dissipated. I think there is definitely an upside potential to my forecast, which of course is of continuing slow recovery and gradual progress on the employment mandate. I think tail risk, the risk of a reversal of momentum, has diminished. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. President Kocherlakota.

MR. KOCHERLAKOTA. Thank you, Mr. Chairman. During the intermeeting period, we talked to a wide range of financial market participants in Minnesota about the possibility that Federal Reserve policy was inducing excessive risk-taking. Much like the QS memo that we received, our contacts identified two possible problems. First, profit pressures associated with ongoing low interest margins could induce financial institutions to buy unduly risky assets or make unduly risky loans. Second, a sharp upward correction in interest rates after a prolonged low interest rate period could well prove challenging for some institutions.

By and large, our conversations suggested that both of these seemed like possibilities, as opposed to realities at the current time. However, there was a general complaint that anyone who relies on asset income—households, banks, or, really, businesses more generally—is being forced by Fed policy to make riskier financial investments than they otherwise might like to do.

In responding to these concerns, Mr. Chairman, I found myself drawing on your recent speech on long-term interest rates. I strongly agree with what I saw as one of your main points. The Fed and other central banks may seem to be controlling interest rates. After all, we talk about how we are. But if we are to hit our mandates, we have to adjust interest rates in response to asset market pressures. I see these pressures as having been profound. Households and businesses around the developed world are looking to hold safe assets as they respond to increased uncertainty about the future, uncertainty that is fueled by demographic shifts and potential changes to entitlement programs. At the same time, there are fewer safe assets available around the world. After all, neither U.S. residential debt nor Greek debt seems as safe to investors as they did in 2007, and I guess Cypriot debt probably doesn't seem quite as safe either at this stage.

Central banks did not create these changes in asset demand or asset supply, but these changes do mean that central banks have to lower interest rates dramatically if they are to hit their mandates. In other words, the public should be thinking of central banks as responding to a low interest rate environment, not creating a low interest rate environment. Indeed, our ongoing failure to hit either of our mandates suggests that we have not been sufficiently responsive to this new environment.

As I think about these forces in asset markets, I find myself questioning an assumption that we often implicitly or explicitly make. Interest rates will eventually re-normalize at close to their great moderation levels. I'm not sure why we expect that to be true. After all, the demographic challenges that I talked about are likely to be with us for a long time to come, as are the associated uncertainties about entitlement programs. My thinking has led me to lower my projection of the long-run fed funds rate to 3.5 percent, but I notice I'm not alone in this perspective. I think Participant 14 in the SEP has a forecast of 3½ percent as well, and Participant 6 is at 3¼ percent for the long-run fed funds rate. If those forecasts prove to be correct, then over the long run, appropriate monetary policy will be systematically more accommodative than would be suggested by monetary policy rules estimated from pre-2007 data.

Now, obviously these long-run projections have a great deal of uncertainty about them, but I do think we should be cognizant of these possibilities as we plan for and communicate about our exit strategy. Actually, our conversation earlier today brought up another issue that if, in fact, in the long run, interest rates are going to be as low as, say, Participant 6 has identified at 3¼ percent, long-run real interest rates are going to be very low as well if we also are hitting our expected inflation of 2 percent. I think this is really going to mean that some of the financial stability concerns that several of you around the table have identified are going to be with us

over the longer haul. They're not going to be something that is with us just for the next two or three years, but part of ongoing appropriate monetary policy is going to be to maintain these low interest rates, and that's going to put pressure on the other tools that we have to respond to financial stability.

But let me turn back to the medium term. My outlook under the Tealbook's baseline policy is not all that different from the Tealbook's outlook. I am slightly more pessimistic about growth in 2014 and 2015. I'm slightly more optimistic about inflation than the Tealbook or any of the DSGE models, for that matter, in the sense that I see inflation converging at 2 percent by 2016, and none of those models have that kind of forecast. They have inflation running well below 2 percent over that time horizon. My forecast for unemployment is about the same as the Tealbook's, which suggests that I'm projecting a lower labor force participation rate at the end of this time horizon. So the inflation outlook continues to be below our target of 2 percent. The unemployment rate outlook remains elevated. This does not suggest that we should be removing accommodation at this time.

Let me close by prefiguring some of the remarks I'll be making later in the policy round. I think in July of last year, Mario Draghi got a lot of attention and was able to provide a lot of benefits to the European economy with his famous statement in a speech that he made: "whatever it takes to preserve the euro." I think there's a sense that the Fed provided that same kind of policy framework—I would call it "whatever it takes lite," so to speak—in September of 2012 with the large-scale asset purchase program. Also, the change in language that we offered about the fed funds rate at that time really gave the feeling that the Fed was there to support the recovery for as long as it took—and, in fact, longer.

I share some of the concerns that I think we're going to hear about the large-scale asset purchase program, but I really am very concerned about the idea of stopping it or even tapering it in the absence of clear economic information to support that decision. I think that would cause a loss of credibility for us, a credibility that is vital for us at the zero lower bound where so much of our stimulus and so much of our accommodation is reliant on what people believe we're going to do in the future. That kind of start-and-stop mentality is really, I think, what many observers have faulted the Bank of Japan for during the past 15 years of deflationary experience. What I'll try to suggest in the policy go-round is that there are ways that we can provide the same kind of accommodative, whatever-it-takes mentality without relying so heavily on asset purchases, by substituting other tools that we have at our disposal. Credibility really should be a key theme for us as we think about our policy stance in the near term. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. President George.

MS. GEORGE. Thank you, Mr. Chairman. The Tenth District economy continued to grow since the last meeting, but at a slower pace than the nation. The mandated federal spending cuts appear likely to hit our region harder, as the share of federal government spending grants in employment is larger than in the rest of the nation. Based on our February manufacturing survey, concerns about these cuts already seem to be negatively affecting production in both defense and nondefense sectors. The index declined moderately, in part because of bad weather and a continued modest decline in energy-related manufacturing. Many contacts, however, indicated the recent changes in fiscal policy were having a negative impact on their businesses, including several producers of nondurable goods who noted a decline in consumer demand. In general, the survey showed firms in a variety of industries are continuing to express caution about adding workers and taking on more debt. However, housing activity in the region

continued to grow strongly, and prices for single-family homes were up solidly from year-ago levels.

Activity in Colorado is particularly strong, where house prices are up over 10 percent from year-ago levels. Office absorption in the region also continues to rise. Farmland prices continue to rise rapidly despite a greater supply of land coming to auction last year. Because of anticipated year-end tax changes, prices for cropland increased another 25 percent from year-ago levels. Agricultural commodity prices also remained high, boosting farm incomes. Finally, in the energy sector, activity is shifting away from drilling and toward pipeline construction. For example, drilling activity is expected to basically be flat in 2013, while pipeline construction is expected to more than triple in the year ahead.

In terms of the national outlook, my forecast assumes that higher taxes from the fiscal cliff deal and full sequestration are likely to subtract from growth this year. However, with continued growth in private demand and improving labor markets, I expect a moderate pace of growth over the next several years. The continued improvement in the labor market is particularly encouraging, including its surprise to the upside, and housing markets continue to recover with higher home prices and housing starts.

With the rise in residential construction activity and new single-family homes for sale near 50-year lows, there may be potential bottlenecks in certain sectors feeding into housing construction. For example, one of my directors described the reduction in builders' ability to rapidly expand production of raw materials used for housing construction, such as lumber, because capacity was cut dramatically during and after the recession. His assessment was that capacity in some of these sectors was unlikely to expand until the level of residential construction activity rises another 25 percent. Until then, the expected price pressures would

build for materials and inputs into housing construction. Some lumber prices as well as building paper and board have increased about 30 percent over the past year. These pressures and low inventory levels are likely to further support rising residential construction, construction employment, and home prices.

Despite the improvements in housing and labor markets, I expect full sequestration and higher taxes will weigh on growth in 2013, and for that reason, I reduced my forecast for growth to 2 percent for this year. I am concerned about the degree of fiscal tightening but do note that large-firm optimism, as noted in the Business Roundtable, as well as small-firm optimism from the NFIB, has rebounded despite the fiscal cliff deal and sequestration.

I expect inflation to remain below 2 percent this year and then rise above 2 percent in the medium term given our current stance of policy. While longer-term inflation expectations are currently anchored, I continue to watch the five-year, five-year-ahead level of breakeven inflation, which has averaged 2.8 percent since the September FOMC meeting, compared with 2.5 percent from January to September. Thank you.

CHAIRMAN BERNANKE. Thank you. President Lacker.

MR. LACKER. Thank you, Mr. Chairman. The tone of comments from our Fifth District contacts has been generally more positive than a couple of months ago. Much of that better tone concerns housing. People say that the improvement in residential markets feels real to them. We're hearing that unfinished developments are being completed and the supply of lots is getting tight in some locales. We're also hearing about emerging price pressures in the building supply pipeline, such as President George discussed. One contact, however, believes that some multifamily markets in our region are going to be overbuilt, given all the projects under way. The commercial real estate picture is steady or improving, except for D.C., where a

lot of transaction activity is said to be attributable to firms restacking office space, meaning moving into new quarters in order to reduce square footage per worker.

Manufacturing activity is rising. Preliminary readings on diffusion indexes this month placed them into positive territory for the second month in a row.

Labor markets in the Fifth District have been mixed. Some types of workers are reported to be hard to find, and there are reports of wage pressures for key IT staff. The Affordable Care Act has many small and medium-sized businesses worried, and we've heard several reports of companies preparing to reduce their head count to below 50. A number of our contacts report cutbacks related to sequestration. One was a furniture wholesaler in Maryland with many government agency clients. Another was a banker from the Hampton Roads area who hasn't seen any direct impact yet but is concerned about the potential fallout in the region from defense cutbacks, particularly delays in maintenance on several aircraft carriers that are docked in Newport News. And another was a textile manufacturer from the Carolinas who has furloughed workers and had to close plants because government orders have dried up. His nongovernment business is strong, however.

In preparation for this meeting's projections, I've been thinking some more about my forecasts over the past two or three years. A stylized characterization of my record is that I forecast real GDP growth to rise to over 3 percent within four to six quarters, but it never does. Instead, real growth keeps coming in right around 2 percent. The plight of Charlie Brown's field goal attempts come to mind. [Laughter] It's cold comfort that I'm not alone. Many other forecasters appear to have suffered similar indignities.

The record has me again reexamining some key premises of my outlook. In particular, I'm taking seriously the notion that trend growth is going to be near 2 percent for the foreseeable

future. This doesn't have to be a permanent downshift, but it might be the operative trend growth rate over the next 5 to 10 years. So I'm in accord with the Board's staff's estimate that potential output is growing at close to 2 percent. I'm not sure I agree with them, however, that the level of output is far below potential right now.

There are several factors that contribute to the slow growth outlook, but I think declining labor force participation deserves special attention. Obviously, demographic trends, such as the aging of the baby boomers, have been driving the downward trend in participation for some time, and participation often falls in recessions. The key question is, how much of the recent decline is due to cyclical factors and how much is due to trend factors? The Tealbook's estimate of the trend rate of labor force participation is about $\frac{3}{4}$ percentage point above actual labor force participation right now. That's an ocular estimate on my part. Some work I've seen, though, has made me receptive to the idea that we might actually be closer to the trend line than that right now for labor force participation, and, thus, the cyclical fall in participation rates may be behind us. That would imply that we're probably closer to the trend line or natural rate for real GDP, and that would explain some of my forecasting errors over the past few years.

I was heartened to see the better-than-expected news on retail sales last week, and that suggested we should mark up first-quarter growth as many people have done. Many observers had been expecting a setback in consumer spending in response to January tax changes, so the continued growth was a surprise. But the numbers seem to me more in line with the recent 2 percent trend in household spending than with anything higher than that. So I don't read them as a signal of any imminent acceleration. I'm wary of falling for Lucy's trick again.

One observation on the subject of financial stability in the spirit of President Bullard's appeal for better understanding: I think we should be careful not to think of financial instability

as plain vanilla, as a single, undifferentiated good, as if we're indifferent about the cause or the particular origin of a particular event of financial instability. The warranted treatment is likely to vary significantly on different causes one could imagine, and I don't think we're at the point where we can identify a single generic class of causes. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you, Mr. Chairman. I think that the Tealbook forecast is pretty reasonable. The only exception, in my mind, would be the assumption of \$500 billion of LSAPs this year. That seems very much on the low side.

My assessment of the economy goes like this. Economic fundamentals are improving along the lines that many have outlined in recent meetings, including a household deleveraging process well advanced, a housing-sector recovery, and so on, but the fiscal drag has increased markedly, and so far it's a tug-of-war between these two offsetting forces. People have seemed to be reaching the conclusion that the improvement in fundamentals is going to win, but I think it's too soon to reach that conclusion. Certainly, the level of uncertainty—in my mind, at least—is still high because we don't know how powerful the fiscal restraint is going to be in restraining demand, when it's going to become most evident, or how long it's going to last. And I would say in that regard, in a few months I think we'll know quite a bit more than we know now. We'll know if the fundamentals are winning out and whether the improvement in payroll and employment growth is sustainable or not.

On the issue of the improvement in the labor market, I would just point out we've seen this movie before. In each of the past three years we've seen acceleration in payroll growth to 200,000 or more per month without a commensurate acceleration in economic activity. In the past episodes, the gap between payroll gains and growth was closed by payroll gains slowing.

So I think it's premature to get too worked up about the employment data, especially when real GDP growth looks to be on a trajectory of only about 2 to 2½ percent in the first half of this year, and that's in fact boosted a bit by some of the special factors that are supporting growth in the first quarter that are going to turn out to be temporary.

On inflation, I don't see any signs of upward pressure on inflation or compensation trends, and the firming of the dollar should reinforce that. On this score, I've been thinking a lot about what the rise in U.S. oil and natural gas prices means in terms of the implications for inflation. I think that we should think of it as a terms of trade shock in our favor. So, one consequence over time, all else being equal, is that we should expect the dollar to continue to strengthen, and that obviously would also be a factor damping inflation. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. Governor Yellen.

MS. YELLEN. Thank you, Mr. Chairman. The data flow since our previous meeting has contained welcome surprises pertaining to housing, consumer spending, and employment. In response, I have upgraded my assessment of the underlying strength of private demand. Unfortunately, the disappointing news that the Congress allowed the sequester to take effect largely offsets the impact of these favorable developments on my outlook. The spending cuts resulting from the sequester will exert noticeable drag over the remainder of the year, and I am less sanguine than the Tealbook that an agreement will be reached to cushion the blow. Overall, similar to the Tealbook, my projections for growth, unemployment, and inflation are little changed since our previous meeting.

Like others, I have been surprised and pleased that consumer spending seems to be holding up better than I had expected, following the tax hikes at year-end, although we may still

see some further response in the coming months. Spending on consumer durables has also remained solid. I see low interest rates, improved credit availability, substantial wealth gains from rising equity and house prices, and considerable pent-up demand as key drivers.

The recovery in the housing market has also gained traction. House prices have risen a solid 8 percent over the past year by the measures we track, and there is evidence of acceleration. Here, too, I see low interest rates as supporting recovery. Rising house prices create the potential for a substantial endogenous easing of credit constraints. For example, detailed loan data suggest that borrowers with less-than-pristine credit find it much easier to access mortgage credit when they have enough cash or equity to finance a 20 percent or better down payment. This prospect improves as house prices rise.

More generally, rising house and equity prices support housing and consumer spending, which in turn raises income, stimulates job creation, and improves the creditworthiness of borrowers as well as the health of the financial system, and such developments can potentially spark a self-reinforcing dynamic of recovery. I consider it particularly regrettable that additional fiscal drag now seems poised over the coming year to sap momentum from this process.

Turning to the labor market, I was encouraged by the two employment reports we received since our previous meeting. As David noted, the level of private payroll employment now stands about 300,000 above the level projected in the January Tealbook, and unemployment moved back down in February after a transitory increase in January. Since the announcement of our asset purchase program, unemployment has declined around 0.4 percentage point, and other broader measures of labor market slack have moved down in tandem. A movement of this size certainly qualifies as an improvement in the labor market.

I remain concerned, however, about the pace of progress since September and the outlook going forward. In particular, most of the reduction in labor market slack we have seen came late last summer. And since the report for September, measures of slack have basically moved sideways. We still have not seen an appreciable pickup in hiring or quits. Labor force participation continues to edge down, and in the Michigan survey, expected labor market conditions have deteriorated.

With respect to the outlook for the labor market, I think the jury is still out, since, as President Dudley noted, we have had several episodes during the past three years in which the labor market appeared to be taking a turn for the better only to stall out over the following months. In that regard, I am concerned that recent employment gains owe more to weak productivity growth than to strong output growth—a pattern, as in the past, suggesting that they may not be sustained. Indeed, my forecast for 2013 envisions growth only slightly above trend, a pickup in productivity growth toward trend, and marginal further improvements in the labor market.

We will discuss the efficacy and costs of asset purchases later this afternoon and our policy options tomorrow, but for me the bottom line is that, while there has been some improvement in the labor market, I don't yet see any substantial improvement in the outlook that would now warrant curtailing our purchase program. Of course, my forecast is shrouded in uncertainty, and my assessment might change if, as I hope, the next several months bring continued strong employment gains, further declines in the unemployment rate, and good news pertaining to the overall outlook for growth.

Regarding risks to growth, I see them as more balanced than before but still tilted to the downside. The handling we have seen of Cyprus's banking issues shows that even though

Europe had been muddling through and global financial stresses had eased considerably, the potential for further turbulence and adverse spillovers due to European developments remains sizable. Moreover, I am concerned that continued failure to reach agreement on a balanced deficit reduction plan could impose yet more restraint on business hiring, investment, and consumer spending. Downside risks also arise from the very limited ability of monetary policy to offset further negative shocks.

On inflation, I, too, see the risks to price stability as skewed to the downside. Since last April, PCE inflation on a 12-month basis has been running, on average, $\frac{1}{2}$ percentage point below our longer-run inflation objective. Moreover, as shown by the exhibit “Evolution of the Staff Forecast” in Tealbook A, in recent years the staff has never projected core inflation at any horizon to run 2 percent or higher within the regular projection horizon. Thankfully, inflation expectations, based on surveys of households and professional forecasters, have remained firmly anchored. But it is important to remember that the stability of expectations has occurred in the context of record levels of monetary accommodation and a public perception that the Committee is prepared to do whatever it takes to return the economy to maximum employment. Absent such a perception, I fear that we could see further disinflation, and we would run the risk of inflation outcomes similar to those that have plagued Japan for the past 15 years.

Finally, I’d note, in response to the comments that President Kocherlakota made about the neutral real funds rate, that I will confess that I am Participant 6. I recorded a $3\frac{1}{4}$ percent neutral rate and for exactly the reasons that President Kocherlakota described. I see the drags on aggregate demand as being persistent, at least over, let us say, a 10-year horizon. And the number that I put down accords with estimates of the short rate 10 years out that come from the staff’s three-factor model.

CHAIRMAN BERNANKE. Thank you. Governor Duke.

MS. DUKE. Thank you, Mr. Chairman. My outlook for the economy is not substantially different than it has been for the past several meetings. I expect the housing recovery to exert an increasing influence on the overall recovery, but I am less and less sure how it will evolve.

I recently gave a speech to the Mortgage Bankers Association on housing and mortgage markets. And in putting together the speech, I learned some things that actually surprised me and caused me to think about the housing recovery somewhat differently. I'm still trying to fit these pieces together, but I thought I'd share some of what I have learned. Some of you can probably put them together better than I can.

Looking at the data, you get the impression of a fairly smooth, gradual improvement in housing. But I now see powerful, and maybe even tectonic, forces on both the supply and the demand side that could emerge at any time in the form of either breakout growth, as in the "Housing-Led Recovery" alternative simulation in the Tealbook, or feed into inflation through owners' equivalent rent.

First, the pent-up demand from weak household formation is like a sleeping giant. Net household formation averaged 550,000 from 2006 to 2011, lower than any other five-year period since the mid-1960s. Going forward, one Board staff model projects household formation to nearly triple, reaching more than 1½ million for several years. But many of these households, especially the younger households, may not qualify for credit in the current underwriting environment. At the same time, households that are leaving homeownership due to foreclosure or short sales, households with remaining debt loads that are high relative to their income, and households who have impaired their credit during the downturn are all unlikely to qualify for

mortgage credit. And many new and existing households may have a reduced appetite for homeownership after watching house prices plummet and foreclosures multiply.

All of this adds up to growing demand, possibly accelerating demand for housing and, in particular, for rental housing. These forces also seem to indicate lower homeownership rates and more demand for rental housing that looks more like traditional owner-occupied housing—that is, single-family homes in good school districts. Large-scale investment in single-family houses seems to be gaining traction with institutional investors, so the possibility of a changing model for rental housing is a real possibility, especially if rents keep rising and vacancies keep falling.

But even as demand grows, supply is steadily tightening. The number of single-family homes for sale has fallen to the lowest level in a decade. Realtors continue to report shorter times on the market and multiple offers for attractive properties, and, in fact, the National Association of Realtors now blames the lack of supply for the lackluster level of home sales. These conditions are only expected to intensify as the spring selling season approaches.

It is true that tight supply has produced higher prices, and higher prices will push more underwater homeowners above water. Data are hard to get, but the Board staff estimated that a 10 percent price increase would bring about 40 percent of underwater homeowners above the surface. So this might bring more activity to the home sales market, but I can't see how it relieves the overall supply-and-demand dynamics in the housing market. Assuming they are still going to live somewhere, they will just add to demand as well as to supply. Similarly, I don't expect much relief from the long-anticipated but never-materialized flood of homes from a shadow inventory. Those houses are increasingly concentrated in states where legal barriers to foreclosure are keeping them from moving through the foreclosure pipeline.

So maybe all of this leads to a boom in new construction. I think it should, but I am hearing more and more about supply constraints there, too. Multifamily construction is reportedly red hot, but even at red hot, it is difficult for multifamily construction to fill the holes created by dislocations in the much larger single-family market. Moreover, permitting issues, difficulty aggregating sufficient land, and limited permanent financing all act as brakes on new multifamily construction. I don't have a real data source for single-family construction, but I am hearing a lot of stories about lot shortages and limited subcontractor availability, concerns that are not unusual for builders but seem a bit out of place at this low level of production.

Bankers I quizzed said that most of the construction under way is being built by the large national or regional builders who have sufficient cash and lot inventory. They reported that maybe one in five of the smaller builders and subcontractors that they financed pre-crisis is still in business. And a number pointed out that much of the labor used by the smaller builders and subcontractors during the boom had been undocumented workers.

My point relating all of these little factoids is that expecting changes in conditions to unfold slowly could be a mistake. I suspect that rather than a gradually strengthening housing market, we may actually be seeing a profound imbalance between supply and demand and a fundamental shift in our housing model all at the same time.

The same deceptive calm may be present in mortgage markets. Even as overall mortgage volume picked up in response to lower rates, purchase mortgage originations fell to levels last seen in the 1990s. Refinances are 75 to 80 percent of total volume, and HARP 2.0 loans are a significant part of refinancing volume. But lenders report slowing take-up by HARP 2.0 borrowers, even with a large number of potential HARP borrowers still in the money. Increases in mortgage rates affect potential borrowers differently depending on their expectations for rates

in the future. If the rate increase is expected to be temporary, applicants rush to the sidelines to wait for rates to fall again. But if rates are expected to continue to rise, applicants stampede to catch the perceived rate bottom, and at some point such an expectation could combine with rising house prices to accelerate purchase demand.

Today, every conversation with a mortgage lender is peppered with angst about putbacks, servicing problems, recent regulatory actions, pending regulatory actions, and a firm resolution not to risk any future problems, even if it means lower profits or exiting the business altogether. So it is hard to be confident that credit conditions will ease as the refinancing boom subsides. Overall, I expect the effects from housing to be quite positive, but it could be a very rough ride. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. Governor Tarullo.

MR. TARULLO. Thank you, Mr. Chairman. A number of you in your presentations have already touched on the question of what constitutes substantial improvement in labor markets. And I thought I would devote all of my remarks to that question, trying to pay a little attention to the conceptual issue of what we are trying to measure in terms of improvement, then turning to the issue of what has happened over the past few years, and also asking what indicators may be most revealing in trying to assess whether there has been substantial improvement. I'm not under any illusions that the effort I am going to make now is going to lead to a happy consensus on the point among the 19 of us. Obviously, as with all quasi-legal standards, people's application of the standard depends a lot on where they want to get. But I thought it would still be useful to try to go through the exercise a little bit more systematically.

With respect to the more abstract question of what is it that we are looking for in substantial improvement, I want to begin with what the Chairman said at his September press

conference in explaining that phrase, which, of course, appeared then for the first time in the FOMC statement. One point he made was that we would be looking for “sustained improvement in labor market conditions and declining unemployment.” And then, a bit later in the press conference, he elaborated this thought in saying, “There’s not a specific number we have in mind. But what we’ve seen in the last six months isn’t it. We’re looking for something that involves unemployment coming down in a sustained way, not necessarily a rapid way, because I don’t know if our tools are that strong, but we’d like to see an economy which is strong enough that it will support improving labor market conditions and unemployment that’s declining gradually over time.”

I think in looking for improvement, what we are looking for is a nontransitory, positive trajectory, not necessarily for an indication that we have full employment in sight. The idea of the LSAP program, at least as I understood it, was to establish more traction and momentum on the road to full employment, not to reach that destination. For this purpose, I think the job growth numbers are probably the first and most important indicator to which we should look. More specifically, I would suggest we look for a sustained level of job growth that significantly exceeds the rate of new entry into the labor market, and that is accompanied by a declining unemployment rate.

I would note in passing that the slower rate of trend labor force growth today compared with that which prevailed during past recoveries means that lower levels of job creation than were seen historically can still meet this standard of exceeding the rate of new entry into the labor market. I saw one analysis that suggested that over the past year and a half or so, the difference between labor force and payroll growth rates is actually comparable to that of the admittedly fairly mild recessions of the early years of both of the two prior decades.

In a minute I will turn to the data to try to fill in this abstract notion some. First, though, I want to explain why I am inclined to pay considerably less attention to some other labor market indicators for this limited purpose of determining whether there has been substantial improvement in the labor market.

I do think it is useful to take notice of hours worked and some other common data series, but there are numerous other indicators where it is at least plausible to think we may not see much improvement, even if things are looking better more generally. An example would be the labor force participation rate, which a number of people have mentioned, which has definitely declined more than the pre-crisis downward trend based on demographic change would have predicted. One might reasonably think that an improving labor market should see participation rise closer to that preexisting trend as people are drawn back into the labor force by brighter job prospects. We may yet see that happen, but some labor economists are telling a story of a sizable cohort of people in their 50s having left the labor force during the Great Recession and indicating that they do not intend to come back even as unemployment falls. This is expected to be a one-time event, and thus they hypothesize that the actual participation rate will eventually converge with that extrapolated pre-crisis trend participation rate, but that may take several years. Another example is the components of the JOLTS data, including those on job openings, hires, and quits, which may be very hard to interpret over the next couple of years for both cyclical and structural reasons.

Even if one assumes, as I think is still probably reasonable, that the Beveridge curve will loop back much closer to its pre-crisis position, it is quite possible that the current track up and to the right of the pre-crisis curve will continue until we are considerably closer to full employment and then move rather quickly down—I agree with John on this point. That appears to be what

happens in the derived versions of Beveridge curves for the major recessions of earlier years. The difference, of course, is that those recoveries were much quicker, so that one didn't see a long period of a parallel line on the Beveridge curve. Also, as a structural matter—and I think Sandy was alluding to this—the JOLTS data may be particularly sensitive to a possible secular decline in labor market dynamism. Even after the relatively mild 2001–02 recession, none of the job openings, hire, or quit rates ever returned to their 2000 levels. That is, the apparent secular trend toward decreasing dynamism may be accelerated in recessions.

So with respect to quantifying what all of this means, things look quite a bit different today than they did at the January meeting. This is not, to my mind at least, so much because of the relatively good February jobs number, since there are always fluctuations up and down, but because of some of the revisions that have been made to last year's numbers during the intervening period. In September, when we embarked on this LSAP, the six-month rolling average of job creation was 138,000—not what I would term significantly in excess of the rate of growth of the working-age population. The unemployment rate had hovered between 8.1 and 8.2 percent during that preceding six-month period. With the February numbers, the six-month rolling average of job creation is 187,000, and unemployment is at 7.7 percent, though, of course, half that improvement came just last month.

To put this in perspective, consider the three prior spurts of job growth since the recovery began. There was a sizable but very short-lived spurt in the spring of 2010. The three-month rolling average of March to May in 2010 was 300,000 jobs created per month, all the more remarkable considering that March of that year was the first month since January 2008 in which there was any positive net job creation at all. And some may recall that at that time there were predictions that this was the first sign of the recovery taking hold and this was the turnaround,

which of course proved to be a short-lived hope. Some bad months followed, such that the six-month rolling average never exceeded 120,000 jobs per month at any point during that period, even as the three-month average was quite high.

The second episode was the late spring of 2011, which saw a five-month spurt averaging just over 200,000 jobs per month. But the unemployment rate didn't decline at all in that period—one of the few periods of increasing labor force participation that we have seen in recent years.

Third, and finally, the seven-month period from September 2011 to March 2012 was a pretty good period. Job growth averaged 225,000 per month during that seven-month period, and the unemployment rate fell from 9.0 to 8.2 percent. This period, though, was sandwiched between weak periods. The three-month average following March 2012 was barely 100,000, or essentially no jobs created after taking new labor market entrants into account. Indeed, the tepid labor market performance during those spring and summer months was an important motivation for the current LSAP round.

So what would constitute substantial improvement for purposes of the duration of our LSAP program? Well, people obviously may differ as to whether a six-month rolling average of 187,000 is enough, or whether a 0.4 percentage point decline reflects enough progress. I think at the prior meeting, somebody had mentioned 200,000 jobs over six months and a 0.5 percent decline in the unemployment rate. But I think one can argue that the gains of a six-month period, whether it's at 187,000 a month or 200,000 a month, should be consolidated in order for us to think that there has been substantial improvement. That is, one would hope not to see backsliding of the sort evidenced after the prior spurts.

If I can use a topographical metaphor, it might be okay for a nice set of peaks to be followed by a plateau of some sort, but not by a valley. This seems particularly salient given that despite what I believe to be significant remaining slack in labor markets, we are in a different position now than during that first burst in 2010. I would also note, though, that right now, at least, there appears to be a view in some market quarters that substantial progress means a 7 percent unemployment rate without regard to any of the other things that have been discussed earlier.

As to the outlook, on the one hand, I think many of us share the sense that the headwinds or mud or whatever other negative metaphor you want to use has significantly diminished, so that it is more plausible to think that the economy could build on some momentum. On the other hand, as a number of you, again, have already mentioned, the outlook is already complicated by the fiscal drag from the tax package, and it is now more likely complicated by the sequester, which may slow things down enough to strengthen the case for continued LSAPs rather than to make the case for their quicker tapering and elimination.

There is some chance of that, I think, since the estimate of 0.6 percentage point off growth that has been given for full sequester may be low, given the clunkiness of the cuts. And I think John was alluding to this in some of his discussions with interlocutors about how some of the cuts could affect private-sector activity. I have asked everybody. I asked our economists, I asked CEA economists, I asked CBO economists whether this may be the case, and they all said, “Excellent question; logical; we have no idea.” So I am not in a position to make the case that that may be true, but if you consider that the cuts are being made in a blunt way, affecting things such as Customs inspectors and meat inspectors and the like, it is at least plausible.

To end, the Chairman noted that our tools aren't strong enough to offset a significant fiscal drag. But we now probably have to figure out what is reasonable to expect going forward over the next six months, given the position we are in and the position we have been in. And I'm not going to end, Mr. Chairman, with a statement of my own standard there, but I do think this provides at least some frame of reference for people in deciding what is substantial improvement and how far along we are in that. Thank you.

CHAIRMAN BERNANKE. Thank you. Governor Raskin.

MS. RASKIN. Thank you, Mr. Chairman. My views about the U.S. economy have not changed much since we last met. I continue to expect that economic activity will improve gradually this year, supported, importantly, by accommodative monetary policy. Like many of you, I have been encouraged by some of the spending and labor market indicators that we have received in the last several weeks, but I have not yet seen definitive indications that we have reached the stage of the recovery where that improvement is self-sustaining, especially if fiscal policy continues to be a drag on activity. Last week's report on consumer sentiment was especially sobering. With households still so pessimistic about employment prospects, income expectations, and the ability of the government to help, the recovery still seems in need of policy support.

There is one aspect of the economy that I have been watching particularly closely in terms of whether there will be negative effects on growth and housing. It is spring break, the kids are home, and the focus is on the future of our labor markets—in particular, the growing number of Americans who are burdened with staggering student loan debt.

As our colleagues at the New York Fed have reported, student debt nearly tripled between 2004 and 2012 and now stands at close to \$1 trillion. The share of 25-year-olds

carrying student debt has risen from just over 25 percent to more than 40 percent during that same period. The trend toward higher levels of debt seems likely to continue until the cost of higher education somehow becomes reduced. All else being equal, this rise in debt could curtail spending by these individuals as they divert resources to make debt payments. In other words, instead of buying cars and starter houses, newly minted graduates will be trying to pay off their student loans. Parents are often the guarantors of their kids' student loans, and they are worried about the prospects of their children finding jobs that pay enough for them to make the monthly payments on their student loans, which makes them, too, reluctant to be spending.

Of course, it has historically been the case that when students have taken on debt, they have also greatly increased their human capital and their expected permanent income. Given the increased earning potential that a college degree is generally thought to confer, this increased income potential, even with increased debt, might be a good tradeoff. But it is not such a good tradeoff if the perception of current labor market conditions among students and their parents is that there is not increased earning potential at the time of graduation. Do we know that students are well equipped to do the cost–benefit analysis associated with taking on student loans and making sound decisions? I have only my children and their friends as reference points, and, hence, my worry. [Laughter] Just as we saw many homeowners get in over their heads leading into the financial crisis, believing that homeownership was the American dream and a reliable source of wealth, I'm curious as to whether students and their parents are not being careful enough when incurring new levels of student debt, believing that any college education will be a reliable source of future wealth.

If these students and their families come to discover that the classes they have taken and the degrees they have received are not as lucrative as they had hoped, this could represent a

downward shock to their understanding of their lifetime resources, and thus to their consumption spending relative to if they had not gone to school. College graduates who carry large student debt burdens might also find it difficult to buy a house. The combination of more-stringent underwriting standards by mortgage lenders and higher debt ratios suggests that the current cohort of would-be first-time homeowners may be nearly shut out of the housing market.

While this is surely distressing for those households, it may be a second-order concern from a macroeconomic perspective. As long as the households have the higher income they expected to accompany their new degrees, they will want to live somewhere other than their parents' basement. If they aren't able to obtain a mortgage, then they will presumably move into rental houses and apartments, leading to demand for and construction of these dwellings. They might very well decide to consume fewer housing services—for example, a two-bedroom apartment instead of a three-bedroom house. But they likely will live somewhere. Again, however, to the extent that students have overextended themselves, which is very hard to know at this point, the demand for housing could be curtailed as recent graduates reassess their earnings prospects.

At this point, I consider this issue just a possible risk to my baseline projection, but it is one that I think bears a close watch as the labor market gradually improves and recent graduates assess if their recent employment and income woes are merely cyclical or something much worse. Thank you.

CHAIRMAN BERNANKE. Thank you. Governor Stein.

MR. STEIN. Thank you, Mr. Chairman. My outlook is, as it was at the last meeting, just a shade more optimistic than the Tealbook. I have unemployment at year-end 2013 at 7.3 percent, falling to 6 percent by year-end 2015, very close to the Tealbook. I'm putting

maybe a touch more weight on the “Housing-Led Recovery” scenario, and with respect to the labor market, I am guessing we may get an extra tenth or so of unemployment moving relative to GDP growth as we continue to adjust our views on potential output.

But what I thought I would do in the rest of my remarks is just blatantly cheat and not talk about the outlook but rather get started on some of the issues raised in the fiscal implications memo. There is a lot of stuff in these memos and not a lot of time in these go-rounds. Also, I want to try to say something a little bit geeky, and if it’s 6:30 p.m. or whenever, there’s just no hope. [Laughter] I don’t know if there is much hope now, but let me give it a shot.

If you want to take stock of these fiscal effects, I think we need to keep track of three things. We are going to buy long-term assets, fund short, and hope to have a positive macro impact. So we need to know what the macro impact is, we need to know the expected return associated with our trade, and we need to know the risk associated with our trade.

My take on the fiscal memo is that it deals extensively with the first two, with the macro impact and the expected return, and admirably puts dollar figures on both of those, but has less to say about the third. Of course, it is completely understandable because it is much harder to think about. You can sort of think about the fiscal risk. It is harder to put a dollar figure on it and to put that on a scale with the other two, but ultimately it is a central piece of the puzzle, so I want to try to say something about it.

Let me start by recapping. What does the memo say about the first two? On the macro side, the memo says that if there are significant positive macro effects, “these effects tend to dominate all other fiscal issues.” Obviously, that will depend on your view of efficacy, but let’s just take that as a given for now. I want to set that aside.

Second, and to my mind a little more strikingly, the memo says that even setting aside any macro effects, the net fiscal benefit of LSAPs “remains positive in our baseline case, but only marginally so. We have not previously emphasized this result.” In other words, the memo says, LSAPs are a good idea on fiscal grounds, even if they don’t have any macro effects whatsoever. Again, I think that is striking.

Now, mechanically what is going on is that it reflects an assumption that the term premium, which had been negative, is rising from a slightly negative to a positive value, and it is just a pure expected-return calculation. In other words, if you’re buying the bonds when there is a positive term premium, you hope to earn a little bit, and that is essentially the source of the slightly positive fiscal effect. Now, there is a little nit to be picked here because the term premium is now still negative, and it’s an assumption, but that’s a nit, so let’s leave that aside.

Here is what I think is the substantive thing, which is, if you focus on the expected return and you don’t pay attention to the risk, it is a funny analysis. And one way to underscore that is to say, “If you had this conceptual framework, what advice would the framework in the memo give to Treasury debt managers in normal times?”, where by “normal times” I mean full employment and the standard 1 percent positive term premium.

Well, think about it. If macro effects are off the table, if the term premium is positive, and if the only source of fiscal gains or losses is the term premium, according to this conceptual framework, then the Treasury should be going entirely short because it is cheaper to borrow short. You should do it all with bills, or, if you don’t like rollover risk, floaters. Floaters are great; the Treasury should be financed entirely with floaters. Of course, this is not what the Treasury does, either now or in normal times; rather, they issue long. They choose to pay more in normal times. They actually choose to pay quite a bit more.

So if you think about it, if we go back to a 1 percent term premium, and, roughly speaking, the Treasury has \$10 trillion of long-term stuff outstanding, they are paying \$100 billion a year to ensure against something. Maybe they're doing that out of mistaken beliefs or out of bureaucratic something or other. But if there is some public-spirited objective in there—and, of course, finance ministries around the world basically do this to some extent—it seems we should be taking part of that on board ourselves. In other words, we, too, should care about the interest rate risk that we are imposing on taxpayers.

Let's be clear: This doesn't mean that that's the only thing we should take into account. Our mandate makes us care about the macro benefits, and we should weigh the two. I'm not arguing we should get the same answer as the Treasury Department, which is not weighing the macro benefits. It is completely consistent that we would go in opposite directions in the current environment. It's just that we shouldn't disregard that piece of the cost that comes from interest rate risk.

Okay. We should care about it. But of course, the hard thing is, how much? Maybe it's just second order, and you can ignore it. It weighs much less on a scale relative to macro stuff. I think that's hard; I'm going to take a wild guess. I'm not going to really be able to push back on that very forcefully. It is a hard question. If you try to think about it from theory, and then say, "Well, you know, if we lose a lot of money doing this, the Treasury is ultimately going to have to raise taxes, but they can smooth that over a long period," that makes it less of a problem. It is going to depend on covariance. In other words, if we tend to have rates rising at a time when the economy is strengthening, that is not as bad a problem. So there are all these kind of conceptual issues, which, if you think about them enough, they are going to just give you a terrible headache.

Here is an alternative approach—just use the data. And let's make a heroic assumption. Let's look at what the Treasury does in normal times, and assume that they are doing it for some sensible reason. Okay? Let's use a kind of revealed-preference approach. What can you learn from this? Suppose in normal times, the Treasury has a debt maturity of, let's say, five years, and there is a term premium of plus 1, which is kind of the average value. Well, what could you infer from that? They are at the optimum. They are at five years. They always could go shorter, if they wanted to. It must be that they are just balanced. What does that mean? It means that the 1 percent gain that they would get from shortening the average debt maturity must be, in their mind, just offset by some marginal cost. And I'm going to call that marginal cost how much they feel the interest rate risk is. Okay? That is just an observation.

Now, assume that in today's world, the term premium is gone. It has gone to zero. Well, then, you'd see the Treasury trying to term out, as they are. Now, suppose we start pulling them back in the other direction, and we pull them back to the point where debt maturity is where it is in normal times on a consolidated basis, so five years. What is the cost there? Well, I can tell you it's 1 percent. It used to be we were just in balance with five years average maturity, a benefit of going shorter of 1 percent, and a cost leaning in the other direction of 1 percent. If I make the benefit go away, all I'm left with is the cost.

So I'm saying, at the margin, if you move debt maturity just below where it normally is, and all of the benefits of it are gone, you are just paying the cost. So that would say, as you just hit the five-year mark, you've got a marginal cost of 1 percent. And then, of course, if you go below that, marginal costs are increasing, so it is presumably greater than 1 percent. So that would give you some kind of a lower bound. What would that translate into, that 1 percent on a 10-year duration, \$500 billion purchase? The cost of the insurance would be \$50 billion, in some

sense; this is a certainty equivalent. The cost of the insurance that we should be willing to pay, if our preferences are the same as the Treasury Department's, should be on the order of \$50 billion. And it gets greater as we go further away from the optimal debt maturity. I promised you geeky. I hope I delivered. [Laughter]

MR. TARULLO. You were right. It was better not to do this right before dinner.

MR. STEIN. This was not dinnertime conversation. Let me just step back. Look, I fully and wholeheartedly appreciate the highly speculative nature of this exercise. The point I'm really trying to make is, these fiscal risks are hard to get a handle on, but that doesn't mean that the right answer is zero, or that we shouldn't be thinking about it. I figured somebody ought to be willing to invent a number, even if it's an easy one to make fun of.

I also don't want to suggest that this is the single most important consideration. Like many of you, I think the financial stability issues are probably more important and even harder to wrap your arms around. But since we are doing cost-benefit analysis, and since we've got a memo that does a very good job of showing us the benefits in numerical terms, I thought it was worth taking a crack at some of the costs. Thank you very much.

CHAIRMAN BERNANKE. Thank you. Governor Powell.

MR. POWELL. Thank you, Mr. Chairman. Economic news since the last meeting has been broadly, if marginally, better. I would point to housing prices, sales and starts, private-sector employment, new orders for capital goods, auto sales, and equity prices. Orders are strengthening in a number of industrial sectors, particularly those with any connection to housing. Business executives are more optimistic in my conversations with them. Another positive is that while fiscal policy is a little bit tighter than the previous Tealbook assumed, we have so far avoided a highly disruptive confrontation. So far. Financial conditions remain

generally healthy and supportive of growth. There is a return to at least normal levels of risk-taking. The situation in Cyprus, though, reminds us that Europe retains the ability to threaten financial stability.

Speaking of financial stability, I want to echo Nellie's earlier note of caution again. We have put in place strong incentives for risk-taking. We should expect that dealers and investors will take more and more risk as time passes. Dealers will assume balance sheet risk and accept risk through a variety of underwriting terms or they will watch their competitors do the business. Investors will assume that the Fed has bounded their downside and take more risk through leveraged credit risk and duration.

Serious financial instability reduces growth in a nonlinear way. And I don't think that we are close to that point, but it is out there and visibility is poor. And you are starting to see those elements of risk that I described. They are very visible in Nellie's presentation, and in Fabio and Matt's observations, and in my own conversations as well.

I continue to believe that the long-awaited years of above potential growth are coming, perhaps soon, and I'm modestly more hopeful that 2013 will prove the year in which the economy finally crosses that line and begins to absorb excess capacity. I have, therefore, grudgingly marked up my growth forecast for 2013 to be more in line with the Tealbook.

I still harbor one particular cautious thought. The debt ceiling has to be raised by the end of the summer. The influence groups have mostly given conservative members a pass on the fiscal cliff and on the continuing resolution. Many think that they will not do so with the debt ceiling. The result could be a very serious confrontation, one with a great deal of downside risk to the forecast and no prospect at all of commensurate benefits.

So the Tealbook forecast is for strengthening in the back half of the year. I hope that is right, of course, but the debt ceiling and, thus, the economy could put that at risk. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you very much. I will now try to summarize the discussion.

The intermeeting data came in more positive than many anticipated. However, fiscal restraint, including a larger-than-expected sequester according to many, offset at least some of the good news, implying a relatively small change in many people's forecasts. Another factor may have been a decline in trend growth. At least one person said that was the explanation of their earlier forecast errors. Downside risks were numerous—slower economic growth globally, the European situation, regulatory issues, fiscal issues including the debt limit, and the asymmetry of monetary policy at the zero lower bound. Tail risks have diminished, however. As for inflation, it is below target, but there were different views on the outlook for inflation. The risks to inflation seem broadly balanced.

Regarding the household sector, consumers seem to be taking the payroll tax increase in stride, with spending holding up so far this year. House prices are improving household balance sheets. However, lower-income households have less leeway, and sentiment is soft. Student loans are a burden and a macro risk. Low interest rates are promoting housing and auto sales. Construction is accelerating, in part because of Hurricane Sandy and with some areas booming. Prices of building supplies have risen. Housing trends may be a battle between household formation and constraints on the supply side.

On the labor market, employment gains have been averaging about 200,000 a month for the past five months, a good number. However, some saw unemployment as declining only

slowly going forward because growth is not sufficient to maintain this pace. One concern is that the labor market may have become less dynamic—that is, transition rates are lower than before. Another risk is that recent gains will not be sustained as required by the substantial-improvement criterion.

In the business sector, some saw businesses as a bit more optimistic as shown, for example, by the ISM and NFIB surveys. However, there is still reluctance to add to payrolls. Participants gave different reports of how businesses view the sequester issue. Increased policy uncertainty may reduce recruiting intensity and help explain the shift of the Beveridge curve. Financially, businesses continue to hold a lot of cash, much of it overseas. They are also strengthening their balance sheets and considering acquisitions. Some are now also looking at capital investments, with some seeing less uncertainty in 2013 than in recent years—“Investment ideas are coming off the white board.” Among the strong sectors that were cited by some participants were manufacturing ex defense; energy, including pipeline construction; and agriculture.

In financial markets, monetary policy continues to ease financial conditions, which remain supportive of growth. Banks are concerned by narrow margins and heavy competition for borrowers. Many firms can finance expansion by cash. Mortgage lenders continue to worry about putbacks, regulatory change, and other concerns. The European crisis has eased, notwithstanding recent developments in Cyprus and a persistent recession in Europe. That is one of the reasons that tail risks have moderated. Lower interest rates and low bank margins may promote risk-taking. For example, farmland prices continue to rise rapidly. But it’s important to understand that the sources of financial instability are varied.

With respect to inflation, inflation has recently run below target. Indeed, there is little evidence of wage or price pressures. However, some other measures of inflation, like the trimmed mean, are closer to 2 percent, and inflation expectations are also well anchored near 2 percent, which might imply longer-run convergence to the target. Further out, some saw upside risks to inflation as the balance sheet grows. Others saw downside risks that inflation might fall even further. One factor damping inflation is a stronger dollar.

Finally, a number of points were made on monetary policy. I won't get them all. One argument for aggressive policy now is that long spells of unemployment lead to essentially permanent losses to income and wealth. A particular challenge for contemporary monetary policy is calibrating the risks of crisis and the effects of crisis on our macroeconomic objectives. And getting safe yields up in a manner consistent with our mandate is very difficult given the economic and financial environment. Indeed, the long-run equilibrium short rate may have declined. Those are just some summary comments, very quickly. Any reaction? Thoughts? [No response.] If not, then in my usual favorite position of clean-up hitter, I will just make a few comments.

Like others, I think the data flow since last meeting was pretty favorable, including not only the labor market report, but both ISM reports, retail sales data, housing data—pretty strong on the whole, and I think some of it has to do at least with monetary policy and financial conditions. If you look at indexes of financial conditions or indexes of financial stress, which four or five Reserve Banks around the table put out, most of them show that financial conditions have eased fairly significantly since last summer and are now more easy than normal, relative to a long-run benchmark. That, along with housing and stock market wealth, et cetera, is improving consumer balance sheets.

We've had a lot of concern about the effects of the fiscal cliff deal on real disposable personal income. It's notable that the fourth and first quarters averaged together is still slightly positive, notwithstanding the big drop in disposable income coming from the payroll tax increase. The fundamental determinant of income increases, of course, is labor markets.

As many people noted, the offsetting factor for the generally good news that we've seen is the sequester, which I fear may even be larger than the Tealbook is assuming. They're assuming essentially a half sequester, and I think there's a reasonable chance that the full force of the deal will hit us. One small silver lining, which the Tealbook discussed, is that if much of the employment impact of the sequester takes place in the government sector through furloughs, and short hours, et cetera, the impact on payrolls and permanent jobs will not be as great as you would guess based on the output content.

Governor Tarullo talked about the recent developments in the labor market and tried to assess whether we had sustained improvement. I think I agree with him and with the Vice Chairman that we have not yet seen improvement over a long enough period to argue that we've met the substantial-improvement criterion. However, I think it is worth pointing out, and I won't spend much time on this, that the recent data on the labor market have been relatively encouraging, and not just for one month. One summary statistic is that, in September at the meeting where we introduced the LSAP program, the Tealbook was forecasting 8.0 percent unemployment for the fourth quarter of this year. The current forecast is 7.5 percent. Projections by participants around the table have also come down about four-tenths for the fourth quarter of this year. And that reflects, of course, the intervening news, including the recent decline in unemployment. And on the payroll side, since September, we've seen the revision to the benchmark estimates of jobs, which was pretty significant and shows that we had more jobs

than we thought and have gained more jobs than we thought. Indeed, even taking into account the benchmark revision, according to the Tealbook's forecast, the level of payrolls in the fourth quarter of 2013 relative to the level last September should be about 3 million higher, which is a pretty significant overall gain. Payrolls have risen, as was mentioned by President Pinalto, about 200,000 a month for the past five or six months.

Aggregate hours have grown at a 2.7 percent annual rate over the past six months. UI claims are down. Hours of work in construction and manufacturing are at the highest weekly rate in many, many years, which suggests that employers will soon be in a situation where they need to add workers. And as far as transitions are concerned, I agree with points made around the table that hiring and quit data are going to be a little bit difficult to interpret, but nevertheless we are seeing some improvements in the transitions between unemployment and employment—rising slowly, still below the long-run trends, but showing some improvement.

A couple of comments on the issue of structural unemployment and bottlenecks. This is a debate we've had many times, but just a couple more pieces of evidence. One observation, which we have also heard before, is that the transition from long-term unemployment to employment has been stable. It's at about 14 percent per month for those out of work between 6 and 12 months and about 10 percent a month for those out of work for more than a year.

MR. LACKER. What's the transition rate?

CHAIRMAN BERNANKE. The transition rate, U to E, unemployment to employment. The point is that these transition rates are pretty stable, and they've risen slightly. We're not seeing any kind of a breakdown in that respect.

The other piece of information I would share with you has to do with the distribution of wages. If you take, for example, the cross section of average hourly earnings across the

188 different industries for which those data are recorded, what you find is a very tight, normal distribution with a center at about 1½ percent. You do not see a big tail. In fact, you see more industries have negative growth in average hourly earnings than have average hourly earnings growth greater than 4 percent. So there's not a whole lot of evidence that there are even any significant number of industries that are showing bottlenecks or shortages in terms of wages. The same thing is true if you look over time and compare the 90th with the 10th percentile of the wage distribution. There has not been any increase in that spread, suggesting again that we're not seeing a lot of bottlenecks in the labor market. Let me be clear what I'm saying. The labor market is still very weak. Obviously, it's still very difficult out there for people looking for work. I do not think that we have, to this point, seen sufficiently strong or sustained improvement to qualify as substantial improvement. Nevertheless, there are some positive signs, and continuation along these lines for a little bit longer would begin to, I think, meet the test that we are seeing meaningful and substantial improvement in the labor market.

A couple of words on inflation, very quickly. It's fascinating that gasoline prices have risen as much as they did in February and yet overall inflation is still barely above 1 percent. There are a couple of reasons for that. One is that the increase in gas prices earlier this year offset a decline in gas prices late last year. So, comparing the average in the first quarter with the average in the fourth quarter, you don't see much change. And going forward, since the gas price increases seem to be due mostly to increases in the spread between retail prices and crude oil, which is due to things like refinery shutdowns, there's a reasonable prediction that gas prices will come down in a seasonally adjusted sense over the next few months. We've been through a pretty big movement in gas prices, and it just hasn't shown through to headline inflation. I'd also mention dollar appreciation as another factor. It was pointed out to me by the staff that the

oil industry is not really a very big part of the U.S. economy, so that maybe it's a little bit too extreme to be worried about Dutch disease and exports of oil creating higher values of the dollar, but, all else being equal, certainly the reduction in oil imports and moving closer to energy independence will lead to a stronger dollar over time, which will have an inflation impact.

Finally, let me just stop here with this one final comment, which was inspired by a talk that Lars Svensson gave at the San Francisco Fed conference just a couple weeks ago. We have been seeing realized inflation below 2 percent and below expectations. So, an interesting question is, is that in itself a source of weak growth? Now, there are two ways in which real interest rates can be relevant. If the expected real interest rate is high, that affects investment decisions and other forward-looking decisions, and we have seen that the zero lower bound is relevant to that issue. But here what we're seeing is a different thing, which is that the realized or, ex post, real interest rate is higher than people thought it was going to be, and one reason that might be important is that it means that debt burdens, for example, are heavier than people anticipated when they borrowed. This is a very mild version of the Irving Fisher debt-deflation type of phenomenon. So what I'm raising here is the possibility that ex post real interest rates are $\frac{1}{2}$ percentage point higher than people expected, or maybe more than that, and that may in itself be a negative for growth. I don't know how important that is, but it is, I think, a point worth noting. Questions or comments? All right. Yes, President Kocherlakota.

MR. KOCHERLAKOTA. Thank you, Mr. Chairman. I think this observation about ex post real interest rates is very interesting, and it's one of the reasons it's important for us to be cognizant of the importance of hitting 2 percent, not missing it from below or above. I mean, when we miss it from below, we're essentially penalizing borrowers, and they're people, too, and they're a source of aggregate demand. Hopefully, that can be stricken. [Laughter]

MR. EVANS. President Fisher didn't have any luck with that.

MR. KOCHERLAKOTA. But in any event, I think it is important for us to be keeping in mind the cost of missing our 2 percent inflation goal from below.

CHAIRMAN BERNANKE. Thank you. All right. We're at a good point to have some coffee and start again at 3:15. Thank you.

[Coffee break]

CHAIRMAN BERNANKE. Okay. It's item 3, on the efficacy and costs of asset purchases. We have four presenters—reading from the right, Michael Palumbo, David Lebow, Min Wei, and Jon Faust. Michael, are you going to introduce the topic?

MR. PALUMBO.⁵ Yes, I'll start. The handout is called "Material for FOMC Review of Efficacy and Costs of Asset Purchases." Large-scale asset purchases (LSAPs) by the Federal Reserve stimulate aggregate demand to the extent that they make financial conditions more accommodative by lowering interest rates paid by businesses and consumers, and affecting asset prices. Our memo about LSAP efficacy begins by summarizing the recent evidence on these financial market effects, which I will briefly review.

Quite a number of papers have found that the Federal Reserve's asset purchases have significantly lowered Treasury yields. Putting quantitative estimates from that literature on an "apples to apples" basis isn't easy, but they do seem to span a considerable range. In our Tealbook projections, we have been relying on the analysis of our Board colleagues Canlin Li and Min Wei, which suggests that a good central assumption is that a hypothetical LSAP cumulating in \$500 billion of purchases will initially lower the term premium embedded in 10-year Treasury yields 20 basis points—a value that is reported in line 1 of the table at the top of your first exhibit. Subsequently, the downward pressure on term premiums is expected to gradually fade away. Lowering Treasury yields is the first step in the transmission of balance sheet actions to broader financial conditions.

With regard to mortgage-related rates, the evidence points to considerable pass-through of the lower Treasury yields and supports our central assumption that a \$500 billion purchase program, split roughly 50–50 between Treasury securities and agency MBS, would lower both agency MBS yields and conforming 30-year fixed mortgage rates around $\frac{1}{4}$ percentage point.

⁵ The materials used by Messrs. Palumbo and Lebow, Ms. Wei, and Mr. Faust are appended to this transcript (appendix 5).

Moving to the effects of LSAPs on interest rates paid by businesses, the empirical evidence has been focused on corporate bond yields, generally finding substantial, though often incomplete, pass-through from Treasury yields to those on investment-grade corporate bonds; significant pass-through to yields on speculative-grade bonds is less apparent. As you can see in the table, we have adopted the central assumption of a 15 basis point effect on investment-grade bond yields and no effect on speculative-grade bond yields.

Another transmission channel for LSAPs operates through the foreign exchange value of the dollar; by lowering the yields on U.S. investments, LSAPs tend to cause the dollar to depreciate, particularly against the currencies of advanced foreign economies. Research by the Board's staff supports a central assumption that a \$500 billion purchase program would lower the major currency index for the U.S. dollar almost 1½ percent and push down the broad dollar index about ¾ percent.

Regarding equity prices, we read the evidence as pointing to a significant effect from the Federal Reserve's asset purchases but a fairly wide confidence interval around any particular point estimate. Studies focusing on effects in relatively narrow event windows indicate increases in broad stock prices in the range of 1 to 2 percent for asset purchases expected to lower term premiums on the 10-year Treasury yield 20 basis points, which is where our central assumption lies. These studies likely miss some of the effects of LSAPs on equity prices to the extent that they materialize over longer periods of time, as we think occurred following the first two rounds of LSAPs, which were undertaken when uncertainty and risk premiums were exceptionally high but subsequently moved down noticeably. The evidence also indicates that the earlier rounds of LSAPs led market participants to expect a more accommodative stance of conventional monetary policy, which could have produced a particularly strong transmission to equity prices. But because the Committee was already using explicit date-based forward guidance about the federal funds rate in September 2012 and shifted to quantitative thresholds in December, the most recent round of purchases may have had a smaller effect through such a signaling channel.

Before handing off to David, I should underscore that I've focused on central assumptions for the size of these effects, but we recognize that the confidence intervals surrounding each of these estimates are wide and the relevant research about them continues to expand. That said, we are confident that the overall effect of LSAPs on financial conditions is positive. David will continue our presentation.

MR. LEBOW. The next step in the transmission channel is from the LSAP-induced changes in interest rates and asset prices to real activity and inflation, discussed in the middle-left panel. Because of the lags inherent in the transmission from financial conditions to the real economy, it is impossible to provide direct evidence of real effects akin to event studies for financial variables. So we start from the presumption that the response of the economy to changes in LSAP policy will be about the same now as it has been in response to conventional monetary policy moves in the past, and that econometric models can therefore be useful guides.

Our “benchmark” estimates of the effects of LSAPs on the real economy depend on numerous assumptions, a few of which are shown here. First, we assume that the federal funds rate remains at the Tealbook path for five years, an assumption that helps isolate the effects of LSAPs alone. I’ll return to this assumption shortly. Second, we assume that FRB/US provides a reasonable description of the macroeconomy in the current environment. Of course, other models would deliver different answers. I should note in this connection that we have in recent months adjusted the asset-pricing equations in FRB/US so that the movements in interest rates and asset prices following an LSAP are similar to those that Michael just described; as noted in the memo, forcing the model to exactly match our baseline financial effects has almost no effect on the simulation results.

As shown at the right, in the benchmark scenario, a \$500 billion asset purchase program, with the same composition of Treasury securities and MBS as the Committee’s current asset purchases, raises the level of real GDP four-tenths of 1 percent after three years, reduces the unemployment rate two-tenths of 1 percentage point at that time, and adds one-tenth to inflation. These figures are somewhat smaller than we believe occurred with the first rounds of asset purchases, because, as Michael said, financial market participants likely interpreted those earlier purchases as also signaling a more accommodative stance of the FOMC’s federal funds rate policy, and because the earlier LSAPs probably helped boost confidence at a time when financial markets were especially stressed.

Of course, different assumptions would generate different estimates, and the bottom panel lists a variety of reasons—and by no means is this list exhaustive—to think that the effects could be smaller or larger than the benchmark estimates. First, the effects of low interest rates on real activity could be attenuated in the current environment. For example, with credit availability still constricted in some markets, fewer potential borrowers may be in a position to benefit from lower interest rates than during more normal times.

The effect of LSAPs on economic conditions might also differ from the benchmark FRB/US simulation because LSAPs affect the pattern of interest rates at different maturities differently than conventional monetary policy actions do—in particular, LSAPs largely affect longer-term financing rates and do not affect shorter-term rates in the same manner as a lower trajectory for the federal funds rate. The FRB/US spending equations generally are based on 5- or 10-year real interest rates, but some spending decisions likely depend on shorter-term rates, which we think would be less affected by LSAPs. Alternatively, as Governor Stein has noted, changes in longer-term interest rates brought about by changes in term premiums might have smaller effects on spending than those associated with changes in expected future short-term interest rates.

Moving to the middle column, one reason why the LSAP effects could be larger than the benchmark estimates is that FRB/US does not allow LSAPs to directly affect house prices. If LSAPs do boost house prices, they could lead to stronger activity through wealth effects and higher consumer confidence. Moreover, higher house

prices could ease the lending constraints for some homeowners, leading to a financial accelerator dynamic that is not captured by the FRB/US model.

Another reason why the benefits from the LSAP program could be larger than the benchmark estimates involves the possibility that the high levels of unemployment could become structural over time, for example as workers lose skills or labor market attachments—so-called hysteresis effects. If the support from monetary policy helps prevent such hysteresis effects from taking hold—a channel absent in the FRB/US model—the benefit to the policy could be quite a bit larger than in the benchmark simulation.

Finally, let me return to the assumed path of the federal funds rate. As I noted, in the benchmark simulation, we forced the actual path of the federal funds rate to follow the Tealbook baseline for the first five years—which we view as a “neutral” assumption. But of course, the announcement of a further expansion of the portfolio might lead the public to revise their expectations for the future trajectory of the federal funds rate, thereby changing bond yields and asset prices today. For example, given the current threshold-based forward guidance, investors and others might reasonably anticipate an earlier liftoff because the LSAP would induce stronger economic conditions. We estimate that an endogenous response of this type could trim the real effects by about half relative to the benchmark estimates. Alternatively, if the public viewed the asset purchases as also signaling a lower path of the federal funds rate, similar to what we think occurred with the earlier LSAP programs, the effects of the LSAP would be larger than in the benchmark case. These alternative results highlight the importance of the Committee’s communications regarding its intentions for the future path of the federal funds rate in conjunction with changes to its asset purchases. Min will now continue our presentation.

MS. WEI. Next, I’ll present results from the memo titled “Assessing the Risk of a Substantial Increase in Long-Term Interest Rates.” As outlined in the upper-left panel of your next exhibit, our memo considers the risk of a substantial increase in long-term interest rates, defined as an increase that would be big relative to baseline expectations and so could cause meaningful investor losses. In particular, we consider outcomes in which the 10-year Treasury yield at the end of 2014 reaches levels roughly 100 or 200 basis points above expectations of market participants or the staff’s projection. The sizes of these prospective increases are broadly consistent with those in the “high interest rate” scenarios included in staff balance sheet and income projections.

The upper-right panel gives the road map for my presentation. I’ll first describe a basic decomposition of long-term Treasury yields and discuss the potential drivers of a substantial increase in the components thereof. Two historical episodes, 1994 and 2003–04, are used to illuminate the sources of potential risk. Turning to the current environment, I’ll use information from four sources—surveys, financial asset prices, and two staff models—to quantify the likelihood of various outcomes for long-term rates at the end of 2014. Finally, I will consider ways in which current monetary

policy tools could serve to amplify or reduce the risks of a substantial increase in rates.

The middle-left panel decomposes the 10-year Treasury yield, the black line, into three components using the staff's term structure model: expected average short-term real interest rates over the next 10 years, the blue line; average expected inflation over the next 10 years, the red line; and a term premium, the green line. Conceptually, long-term yields could rise because investors raise their expectations about future short-term real interest rates—possibly prompted by improvement in the economic outlook, a pickup in inflation, or a reassessment of the FOMC's reaction function—or their expectations about future inflation. Long-term yields could also be pushed higher by an increase in term premiums, possibly due to higher uncertainty regarding future interest rates, higher inflation risk premiums, or other factors.

Experience during two historical episodes, 1994 and 2003–04, may help illustrate these different sources of risk. On February 4, 1994, the FOMC raised the federal funds rate target for the first time after the 1990–91 recession; this was followed by additional increases that brought the target a total of 275 basis points higher over a 12-month period. The 10-year nominal Treasury yield reacted strongly to the short-rate increases, rising 14 basis points on the day of the first increase and about 200 basis points over the next 9 months. Staff models suggest that the increases over this 9-month period reflected both higher expected future short rates and a higher term premium.

Turning to 2003, between the May and the June meetings, FOMC communications emphasizing the need to guard against deflation risks—including comments by Chairman Greenspan—led some market participants to expect the Committee to announce a 50 basis point rate cut at the June meeting and unconventional monetary policy measures at subsequent meetings. As a result, the FOMC's decision on June 25, 2003, to reduce the federal funds rate target by 25 basis points was viewed as less accommodative than expected and likely also prompted an unwinding of some market expectations for unconventional policy measures. The 10-year Treasury yield rose 10 basis points on the day and about 125 basis points by early August. Staff models suggest that the majority of the increases were due to a higher term premium.

Subsequently, the Federal Reserve enhanced its communications, emphasizing in the Chairman's July monetary policy testimony to the Congress that the federal funds rate would remain accommodative for a "considerable period." Over the first half of 2004, FOMC communications laid the groundwork for a gradual removal of policy accommodation, and, on June 30, 2004, the FOMC raised the federal funds rate target for the first time after the 2001 recession. Subsequent moves over the next two years resulted in a cumulative 400 basis point increase in the federal funds rate. In contrast to the 1994 episode, the 10-year Treasury yield declined 8 basis points on the day of the initial target rate increase—reportedly because of the unexpected retention of the "measured pace" language—and continued to edge lower over the next few months.

As summarized in the middle-right panel and as can be seen from the bottom panel, the increases in long-term rates in the few months following the 1994 and 2003 meetings do not appear to have been associated with higher expectations for growth or inflation. Instead, substantially higher expectations of the likely future path of short-term rates and uncertainty about that path were main features of the two periods, perhaps reflecting a lack of clarity regarding the Committee's reaction function. In particular, measures of policy uncertainty one year ahead taken from options on Eurodollar futures, column 7 in the table, rose notably in 1994 and in 2003, as did implied volatilities on longer-dated swaptions (not shown). As noted earlier, some other factors probably also played a role. In particular, sales of Treasury securities associated with MBS hedging flows and the unwinding of leveraged positions by hedge funds likely amplified the initial rise in interest rates in 1994 and 2003, as the average duration of agency MBS, column 8 in the table, lengthened notably following the initial rise in long-term yields. Long-term yields may have also been held down in the 2003–04 period by an increase in foreign demand for U.S. long-term obligations, although this factor is likely more important in explaining the relatively low level of long-term yields over 2004 and 2005 than it is in accounting for the different behavior of long-term yields in the summer of 2003 and over the course of 2004.

Your next exhibit turns to assessing the current risk of a sharp rise in 10-year yields. As summarized in the upper-left panel, we use four sources of information: surveys; swaptions; a term structure model imposing the zero lower bound; and the FRB/US model, calibrated to match the staff forecast. Overall, market participants and private-sector forecasters, as well as the staff, expect a steady but gradual rise in long-term interest rates over the next several years, as can be seen in the upper-right panel. Survey- and market-based forecasts currently lie below the staff forecast, which can be partially attributed to the fact that market participants appear to anticipate a larger purchase program than the staff assumed in the Tealbook. As shown in the middle-left panel, information from the various sources indicates that the risk of an increase in long-term rates to levels 100 basis points above the staff's baseline projection at the end of 2014 is notable but not elevated relative to historical norms (not shown), although historical comparisons are complicated by the novelty of the current policy environment. In addition, the risk to long-term rates appears to be two sided: The models imply sizable probabilities that the 10-year yield will be 100 basis points below the staff's baseline projection at the end of 2014.

The last question we consider is whether the FOMC's current monetary policy strategy, including the use of LSAPs and the threshold-based forward guidance, is likely to amplify or reduce the risk of a substantial increase in long-term interest rates. As noted in the middle-right panel, enhanced communications should help limit movements in long-term rates reflecting uncertainty about the monetary policy outlook—a factor that appeared important in 1994 and 2003. On the other hand, the current policy mix, involving both extended forward guidance and shifts in the size and composition of the balance sheet, is historically unprecedented, and the Committee may find it challenging to clearly communicate its plans regarding the removal of accommodation. In particular, some may be concerned that recent policy

changes—asset purchases linked to the labor market outlook and numerical economic thresholds for the federal funds rate—might have increased the sensitivity of interest rates to economic data in a way that, through the various amplification mechanisms discussed above, could contribute to a sharp increase in long-term rates. To date, we find no evidence of an increase in sensitivity to economic surprises following the FOMC’s policy announcements in September and December 2012. We do, however, find evidence that forward Treasury rates have become more sensitive to economic surprises since LSAPs began in late 2008, consistent with market participants’ likely inference that bad economic news makes LSAPs more likely and staff analysis showing that LSAPs reduce term premiums.

Next, as summarized in the bottom-left panel and reported in another memo sent to the Committee, titled “The Distribution of Holdings of Long-Term Securities,” the Federal Reserve was the second-largest domestic holder of agency MBS as of the end of the third quarter of 2012, while the GSEs have scaled back their MBS holdings. In addition, half of the Treasury notes and bonds outstanding were held by foreign investors, mostly sovereign investors, while the Federal Reserve is the largest domestic holder. The Federal Reserve’s large holdings of agency MBS, as well as the reduction in holdings at GSEs—which have, historically, actively hedged their MBS exposures—suggest that the amplifying effect of MBS convexity hedging may be less pronounced today than in previous episodes. Recent increases in holdings of MBS by agency REITs, which may come under pressure if MBS yields rise significantly, could amplify an initial increase in rates, although their holdings make up only a small portion of the overall market. In addition, staff estimates show that, as compared with 2003, a smaller percentage of the outstanding MBS will become unable to refinance under the scenarios that interest rates rise 100 or 200 basis points above their projected levels both in the current month and at the end of 2014; as a result, the associated amount of duration-extension-related demand of non-SOMA holders, the dark-blue portions of the four last bars in the bottom-right panel, remains well below that experienced in the summer of 2003, the first bar. Of course, those estimates are based on analysis of past experience and are subject to considerable uncertainty, as investors’ hedging strategies and the behavior of prepayments may have changed following the crisis and in light of the extraordinary monetary policy accommodation that has been put in place in recent years.

Finally, returning to the last bullet in the middle-right panel, a rise in interest rates may be amplified if SOMA portfolio sales lead to large increases in interest rate implied volatilities, which may lead leveraged investors to scale back their open positions and result in further increases in interest rates. Depending on the reason for the rise in implied volatilities, Federal Reserve communications could help limit amplification from this source. Jon will now continue our presentation.

MR. FAUST. Thanks, Min. I’ll be discussing staff work regarding the effects of additional asset purchases on the overall fiscal position of the federal government and on Federal Reserve income, capital, and remittances. This work is summarized in a memo on fiscal effects as well as in a veritable cornucopia of additional memos written by the staff at the Board and New York. For concreteness, I will compare the

baseline of stopping purchases in June against a policy of continuing purchases at the current pace through the end of the year. Continuing the program through the end of 2013 would result in \$500 billion in additional purchases.

Our main result is that, so long as the additional LSAPs have some benefits in terms of stimulating economic activity and keeping inflation closer to target, the overall fiscal effects will be positive and tend to reinforce the dual mandate benefits. In the memo, we illustrate that this result is likely to hold for a wide range of interest rate scenarios using the FRB/US model.

Our baseline, high, and low interest rate scenarios are depicted in the panels of exhibit 4. On each panel, there is a pair of lines for each scenario; the solid line is for the case of purchases ending in June; the dashed line shows the effects of extending the purchases through the end of 2013. The main lesson from this exercise is that, while unemployment, inflation, and interest rates (the upper four panels) are very different in the three scenarios, the fiscal benefit of the additional purchases as measured by the change in the debt-to-GDP ratio is approximately the same (bottom-left panel). In each scenario, the additional purchases are projected to reduce the debt-to-GDP ratio by around 1½ percentage points by 2025. This result implies that there is very little interest rate risk once macro feedbacks are considered from the LSAPs.

Do the uniform gains across these scenarios imply that some implausible fiscal “free lunch” is operating here? Not at all. In each scenario, the economy suffers from significant resource slack at the outset. The asset purchases put unemployed resources back to work, and, while there are other effects operating in other directions, the dominant factor is that it’s good to put resources back to work.

Our main result is premised on the view that asset purchases stimulate economic activity. Because there is considerable uncertainty about the efficacy of LSAPs, we also consider their fiscal implications if additional asset purchases do not have beneficial effects on real activity or inflation. In the staff view, the effects of LSAPs on term premiums are relatively well established; thus, we consider the case in which additional purchases lower Treasury yields, as in our standard results, but macroeconomic conditions remain otherwise unchanged.

Under this “no macro efficacy” assumption, the net fiscal effects are near zero. Two factors contribute to this result. First, the Federal Reserve is essentially financing purchases of longer-term securities at the interest rate on excess reserves (IOER). Setting aside some feedback effects, the net income on this position will generally be positive if the return on the securities purchased exceeds the IOER expense. In expectation terms, this condition for positive net income is close to the condition that the term premium on the securities be positive. While term premiums on longer-term securities, computed using the Tealbook forecast for the federal funds rate, have been substantially negative recently, they’ve been moving toward zero in recent months. Under our baseline outlook for short-term and longer-term interest rates, this trend continues and implied term premiums are projected to be near zero,

on average, for the latter half of 2013, when the additional assets would be purchased. Thus, net Federal Reserve income on these purchases is projected to be negative, but not large.

Second, by depressing term premiums for a time, the additional LSAPs reduce the rate that the Treasury pays on new securities issued while premiums are depressed. In combination, the two effects imply that, even if the LSAP program has no effect on real activity and inflation, continuing it through the end of the year would likely have a small positive fiscal effect under the baseline outlook. Although it was not explicitly shown in the memo, under the no-macro-efficacy assumptions, fiscal effects remain small in both the high and low interest rate scenarios.

A worst case for fiscal implications probably arises if we assume away term premium effects as well as all other macro effects of the purchases, and, in addition, we assume that interest rates rise sharply after the purchases are completed. In this case, Federal Reserve interest expense rises with interest rates, but there are no offsetting benefits. Of course, as Min's presentation made clear, we face two-sided interest rate risk. If rates fall or stay low longer than anticipated in the baseline, we have fiscal benefits. While we view the case of no macro and no term premium effects as unlikely, it is worth noting that the welfare implications of the upside and downside interest rate risk may be quite different. The fiscal benefits arise in the low interest rate case, which is likely to be accompanied by economic weakness and, perhaps, disinflationary forces. The higher interest rates and fiscal costs could arise without a pickup in growth, but they seem most likely to emerge if growth picks up.

Overall, then, if the purchases have dual mandate benefits, there are also likely to be fiscal benefits across a broad range of scenarios. If the LSAPs have much smaller dual mandate benefits, baseline fiscal effects are likely to be modest.

Let's turn now to the Federal Reserve's balance sheet, income, and remittances. We have discussed in earlier briefings that, as the recovery progresses and interest rates rise, the Federal Reserve's interest expense for IOER will rise. Higher interest rates will also imply unrealized capital losses on SOMA securities holdings, losses that would be realized if the assets are sold. As shown in the lower-right panel of the exhibit, the combined effects of these factors are likely to sharply reduce Federal Reserve net income in the medium term while unconventional monetary policy is unwinding. In the event that this net income is not sufficient to cover Federal Reserve expenses, dividends, and required additions to capital, remittances to the Treasury would go to zero. In this situation, a deferred asset is booked on the Federal Reserve's balance sheet until subsequent net income offsets the deferred asset.

Even if the purchases were to end in June, as in our baseline, the Federal Reserve faces the possibility of a period of zero remittances in plausible scenarios. Remittances fall approximately to zero for four years under our high interest rate scenario. Continuing purchases through the end of 2013 raises the probability of remittances falling to zero somewhat and raises the likely duration of any period of

zero remittances. In our high interest rate scenario, the additional purchases would add about a year to the period of zero remittances.

Setting aside political and reputational consequences, the staff has not identified significant implications of the time path of remittances as distinct from the consolidated fiscal implications of LSAPs for the federal government. For example, only in the most extreme of situations would balance sheet issues directly constrain the conduct of monetary policy. We do not mean to minimize political or reputational consequences, but we do want to clearly distinguish these consequences from the dual mandate considerations the staff generally discusses.

Let me mention four possible steps that could be taken to address these consequences. First, the FOMC could alter its approach to normalizing the portfolio. As laid out more fully in the exit strategy memo, allowing agency MBS to run off rather than selling these securities would avoid realizing capital losses and help smooth income. Additionally, selling shorter-dated Treasury securities would reduce reserve balances faster than under the current exit principles, yielding savings on IOER. Together, these two steps could return the portfolio to normal size more quickly than under the current exit principles and also substantially reduce the likelihood of booking a deferred asset.

Second, the Federal Reserve could adopt a policy of retaining income now to cover future losses. Given the likely paths of remittances shown in the lower-right panel, some form of remittance smoothing could substantially reduce the risk of zero remittances. As noted in the memo “Foreign Central Bank Remittance Practices,” many central banks around the world use some approach like this. The memo on alternatives for remittance policy illustrates some relatively straightforward approaches to smoothing that the FOMC might consider. While smoothing is a common practice around the world, however, whether or not adopting smoothing at this time would have political net benefits for the Federal Reserve is highly questionable.

Third, the Federal Reserve could continue its proactive communication aimed at making clear the likely net benefits of the purchases both in fiscal terms and in broader, dual mandate terms. As noted in the memo on foreign practices, a number of central banks around the world have taken the risk of, and actually suffered, substantial losses while succeeding in retaining support because their policies were viewed as appropriate.

Fourth, the LSAP program could be curtailed because of the possible consequences of low remittances. The merits of altering LSAP policy based on the time path of remittances depend importantly on whether the purchases are viewed as warranted on dual mandate grounds. If the purchases are not justified on dual mandate grounds, then remittances need not be a factor in terminating the policy. The more difficult case arises when the program is viewed as justified on conventional grounds. The staff believes that there may be significant reputational risks not only to

zero remittances, but also to curtailing a policy that is warranted on dual mandate grounds out of concern regarding the path of remittances.

In summary, there's a very real possibility that remittances may go to zero under the current exit principles with or without additional purchases. Communications, altering the exit principles, and retaining income to smooth remittances are three possible options, short of curtailing the program, that may help moderate these associated risks.

Since Governor Stein took the opportunity to pre-critique my presentation, let me end with an alternative view about Treasury rationality and what we might deduce from a rational Treasury. As Treasury's recently released *Strategic Plan for Fiscal Years 2012–2015* emphasized, the Treasury wears many hats. The first hat it mentioned in its *Strategic Plan* is supporting the recovery. The fifth goal was effective debt management. Suppose that the Treasury believed that one of its tools is not currently set at the optimal level—for example, perhaps the Obama Administration is imposing more fiscal drag than they would like to impose. This puts us in a distinct world of the second best and a world of constrained optimization. Might it be that a Treasury in such a situation would think that LSAPs were a good idea? In fact, we know that the Treasury has been asked many times about whether they intend to offset or object to the Fed's LSAP policy. They've explicitly chosen not to do so. This is arguably consistent with optimization.

The last page of your handout gives the questions for discussion, and this concludes my prepared remarks.

CHAIRMAN BERNANKE. Thank you. Before I open it up for questions, I think we were all very impressed by the amount and quality of work that the staff did in the intermeeting period. So we owe a great debt of gratitude for that tremendous effort. Are there any questions for the staff? President Lacker.

MR. LACKER. Yes. I, too, commend the staff for a great collection of pieces of work. I have a question about table 1 in the very short memo by Paul Smith and Ruth Judson. This is the memo on “The Distribution of Holdings of Long-Term Securities”—we're on page 2 here—which lists Treasury holdings: foreign official, foreign private, domestic. It breaks out a bunch of domestic holdings and the like. What motivated me in looking at this is my sense that the most promising foundation for understanding the effects of our LSAPs on Treasury yields would be this whole preferred-habitat theory. It's been given recent formalization by Vayanos and

Vila, a paper cited in many of the memos. In that theory, there are some investors that have a pure preference for a specific maturity. They really want that maturity of investment, and they're willing to pay up for it. Other investors perform arbitrage across the maturity spectrum, but they're risk averse and their wealth is limited, and so that arbitrage is limited. I got to thinking about that theory when I saw this table, because I started to wonder, which ones of these are habitat investors and which ones are arbitrageurs? Let me give you an example of what I was thinking here. I looked at private pension funds, and I thought, that's a promising category because they've got a relatively predictable stream of future cash payoff obligations. They might strongly prefer to construct a portfolio that precisely matches the term structure of their obligations. They could do that with a carefully constructed portfolio of Treasury maturities, laddering out all of those things, and they have to have the right amount of every maturity. So, if they were doing this, they'd have this pure habitat preference.

You have them down here at \$684 billion. If you look at the flow of funds, they hold close to \$700 billion in U.S. Treasuries. Well, their total assets are \$6½ trillion, and Treasuries are just 10½ percent of their assets. They hold \$2.2 trillion in corporate equities. So they seem to be performing some sort of arbitrage here, looking for higher mean return and giving up the opportunity to exactly match their liabilities. That just made me puzzled. That was the best candidate I can think of. So I'll just open it up to the staff. Who are the arbitrageurs, and who are the habitat investors on this list? Or is there some other, more promising foundation on which to understand how our asset purchases affect longer-term yields?

MR. PALUMBO. I'll start, although I think Min and Bill may know more than I do. But let me just start, because it's most closely correlated with stuff I was talking about. I guess I think we've approached the issue not from that institutional perspective, but in terms of the

empirical analysis and evidence. We've more looked at what Treasury yields have done around the different announcements and communications about the LSAPs, under the thought that if the arbitrage was complete and really robust and really quick, then you wouldn't see the kinds of sizable, statistically significant, and, actually, very consistent responses that we've observed in the data. So, in some sense, we've taken more of an aggregate approach to the analysis. I think that in Bill English's paper with Stefania D'Amico, David López-Salido, and Ed Nelson, they looked a little bit more specifically at the channels by which the LSAPs were affecting Treasury yields, but again, not from the institutional perspective—more from an aggregate perspective. And they saw that the real term premium component seems to be a place where you see the LSAP news having bite. You see a little bit in inflation expectations, certainly in some of the episodes, and then you see it in the nominal term premiums that are associated more with inflation risk or inflation uncertainty. So, from that perspective, you do see a transmission, but I haven't taken the institutional perspective that you were laying out, even though, again, I think you're right that the Vayanos and Vila narrative and the model they build are based around those kinds of stark institutional differences.

MS. WEI. I can try to add to that. In our view, there is some maturity preference going on here. I would view pension funds and insurance companies as some of the preferred-habitat investors. They prefer longer-term securities. So, as you mentioned, they do hold—pension funds, in particular—a lot of corporate bonds, but it's not clear from here whether those corporate bonds are investment-grade—high-grade, triple-A corporate bonds—or high-yield bonds. I would say that some foreign investors' sovereign wealth funds would be at the other end of the spectrum. They prefer to hold very short-maturity securities.

MR. ENGLISH. I guess I'd just add that models like the Vayanos and Vila paper are useful as heuristic ways of thinking about the problem, but you may go too far when you try to bolt the particular groups in the model to particular classes in the flow of funds accounts. As Min said, we think that, broadly, pension funds and insurance companies probably are looking to hold longer-term securities, but it could also just be that some households, in their planning, are holding longer-term securities. They're doing that through long-term bond mutual funds, which are holding mostly long-term bonds. I think it can play out in a variety of ways, and so I wouldn't, I guess, try to read the model that literally in terms of the flow of funds accounts.

MR. LACKER. It just seemed to me like a useful independent check on the plausibility of the narrative. I have in mind that the right benchmark alternative isn't the pure expectations theory of the yield curve. It's one where the correlation of real bond payoffs with people's future circumstances gives rise to a risk premium, and it's either positive or negative—the usual benchmark case with representative agents. If you throw into the mix that people have different views and people's circumstances are going to be different in different states of the world, you get a model with heterogeneous agents, and it's hard to say what term premiums would do on impact. So I just am looking for some independent confirmation of the plausibility of the narrative. I can appreciate that many households might have this. But my first glance at the numbers—I don't see a lot of pure habitat investors here, but it's going to be an eye-of-the-beholder, subjective assessment, I realize.

CHAIRMAN BERNANKE. Could I go to President Kocherlakota with a two-handed intervention?

MR. KOCHERLAKOTA. Yes. I think President Lacker raises some great points. I've struggled with some of the same considerations he's struggling with. I think that, given our

current theoretical understanding, you could build models that would have lots of different possible effects on term premiums from the kind of changes in the term structure of the government debt that we're essentially doing in our large-scale asset purchases. That's where empirical work helps fill in the void a little bit. When a theory is still in its early days, empirics can fill some of the holes in our understanding. I think the challenge there is parsing out the decline in 10-year yields between the term premium and the path of short rates, and the staff is very aware of this. But for me—and I can't speak for anyone else—the bulk of the evidence pushes you to think that there is some effect on the term premium that's going on. But I think that we're doing cutting-edge work here on the empirics side, where, it's hoped, the measurement will lead theory to respond.

MR. LACKER. Could I respond, Mr. Chairman? I agree wholeheartedly. Empirical work is exceptionally valuable, but there are limits to what it can tell us. It can't tell us, in essence, why we're seeing what we're seeing. It can tell you that we see this, but it can't really explain it without some coherent, artificial world in which it happens that you can put your hands on and dissect and understand the causal chains of.

CHAIRMAN BERNANKE. President Bullard.

MR. BULLARD. Thank you, Mr. Chairman. I'm looking at exhibit 1, the middle-right panel, "Benchmark LSAP Estimates." I just want to make sure I've got this right. So I guess this is an impulse response with a completely unanticipated \$500 billion of purchases, and this is the impact effect?

MR. LEBOW. Yes, that's correct.

MR. PALUMBO. Well, what we're showing you is about the peak effect. So this would be the effect three years later. It's not the cumulative effect, which would be a very different

number, because these things, we think, ramp up and then persist a while and gradually ramp down. We're showing you approximately the peak effect, which would happen in the unemployment rate and, actually, in all of these dimensions about three years after the announcement. And it is a surprise announcement that we're calibrating to.

MR. BULLARD. A surprise announcement. I think that's maybe important for the Committee to think about—what's anticipated and what's not anticipated here. Also, would there be a restriction that would keep it neutral in the long run?

MR. PALUMBO. Yes.

MR. BULLARD. Okay. I see. So it's peak effect, long-run neutral. Got you. Thank you.

MR. LAUBACH. Perhaps I can quickly add one point to that. The term premium shock itself is fairly persistent. I think there is a chart of that in your fiscal memo that actually shows the time path of this term premium shock. It's difficult to think of it as just one ping. The persistence of these developments is, to some extent, driven by the persistence of the shock. So, once the program has been initiated, the financial markets are fully aware that the program is going to take this form.

MR. BULLARD. Sure—yes. Actually, if I could just follow up on this. On exhibit 4, Jon, is this the same thing—a one-time, unanticipated announcement of a \$500 billion program with a certain contour that the market completely understands?

MR. FAUST. Yes, the same contour. Let me point out that if we're thinking about, like a decision in June, either continuing or not continuing, one of those two has to be a surprise. Or there's some weighted average. So one of them is a surprise, and if we view it as expected and we decide not to do it—we can think of the experiment that way. Or, it's not expected, and it

comes as a surprise. Those effects are symmetric. You just change the sign. And so I think the right thing to do in this case is to think about a surprise. Which surprise you think it is, is just what sign you put on it.

MR. BULLARD. Well—okay. In these pictures, the path of the funds rate moves around a little bit. So I guess it's a little hard to disentangle what's happening between, is it really just an announcement of a different funds rate path out there in the future, or is it the actual asset purchases themselves? What's the thinking behind that? You probably kept the policy rule the same, and so the policymaker has to react.

MR. FAUST. These are three different scenarios. So they're different economic conditions that are here.

MR. BULLARD. Sure—just take one.

MR. FAUST. And you'll see that the funds rate and liftoff are almost identical in the two versions, the dashed-line and the solid-line version, of each scenario. So there isn't a lot going on with policy, and that's because an LSAP of this size doesn't change the macro conditions sufficiently to lead to much difference in the funds rate path.

MR. BULLARD. Right, but could you get the same result by just saying, "I'm going to announce a different path for the funds rate and not do the purchases"?

MR. FAUST. Oh—in the model, is there a rate of exchange between these two?

MR. BULLARD. Yes.

MR. FAUST. We've gone around a lot about that. Yes, there is. There comes a point when you promise to keep the funds rate at zero out to 2027, and you continue to get effects in the model, and then you're just pushing the near linearity of the model too hard. Whether we

really believe the literal tradeoff at the current time is another matter, but the model implies such a tradeoff.

MR. BULLARD. Well, if that's the way the asset purchases are really working in the model, it's as if you're announcing a different funds rate path out in 2025, and if you think that's not credible, then you—

MR. FAUST. No, it's not "as if." One of the things we've emphasized about the complementarity between forward guidance and asset purchases is that you might view forward guidance as cheap talk, a promise about something that may or may not happen years in the future. And asset purchases are something that involves, in a political-economy sense, exposing yourself to risks and costs up front, and that may help reinforce the promise. The thought that we could do a promise further out, or even the promises we've done, as effectively with no LSAPs—that's a separate proposition. In the model, there's perfect credibility, and so under perfect credibility, there's a clean tradeoff between these two. If we believe we have perfect credibility, there's a clean tradeoff in reality. If we think credibility may be less than that, then we have to start making judgments.

MR. BULLARD. Finally, the red baseline here—you could view it as, maybe that's the optimal policy already. What this shows is that if you did asset purchases, you would move off that baseline somehow and you'd get different results, but this doesn't really say which line is the best line. This just says that you're going to get something else.

MR. FAUST. All we were asking was, if we did it, what would happen fiscally? The Tealbook is where you go to see what is optimal on dual mandate grounds. This is on these other grounds.

MR. BULLARD. Absolutely. Thank you.

CHAIRMAN BERNANKE. President Fisher, do you have a two-handed intervention?

MR. FISHER. I want to follow up on the question on the peak effect over a three-year time frame. I just want to make sure I understand this. So a \$500 billion program for the same composition of purchases as the current program can be expected to have a peak effect of 20 basis points on unemployment over three years—is that correct? Twenty basis points?

MR. PALUMBO. Twenty basis points on the level of the unemployment rate at the end of 2015. That's the efficacy metric that David mentioned in his text, and that's just the peak effect at a point in time. It does build over time, and then it persists a while and decays gradually. So if you preferred an alternative efficacy metric that looked at the cumulative effect on the unemployment rate, it's going to be a lot larger, more like 0.9 percentage point of unemployment over 10 years.

MR. BULLARD. But you say that you also have a long-run neutrality assumption.

MR. PALUMBO. Yes.

MR. BULLARD. So there must be no effect in the long run.

MR. PALUMBO. Right, but it depends on what you want to do. So, if you look far enough ahead, it's zero in level terms, and it would integrate to something meaningful over the intermediate term.

MR. REIFSCHNEIDER. It doesn't integrate to zero. This goes back to the conversation we had, I think, in December—and it goes directly to Jon's point about whether there is a free lunch. These are scarce resources, and so we're putting them to work during this period. Over the period, that cumulates, and it was 0.9 unemployment years. And GDP—I can't remember exactly what it cumulates to, but it was about 2.5 percent in real terms. The point is that you don't offset it with a loss in 2030, 2040. You've got it, and it doesn't go away.

MR. BULLARD. Okay. That's a statement that you're following a suboptimal policy. You can switch to a better policy and you are going to get some gain from that.

MR. REIFSCHNEIDER. Right—yes.

MR. BULLARD. Okay.

CHAIRMAN BERNANKE. Governor Tarullo, did you have a question?

MR. TARULLO. Yes. Thank you, Mr. Chairman. I just have a discrete factual question about the 1994 episode, which appears to have achieved near-canonical status as an argument for better communications in central banks. I remember what happened after the Fed made its announcement. I will confess I don't remember what happened beforehand. I'm told by someone who was a pretty close Fed watcher at the time that Chairman Greenspan actually, on multiple occasions—

VICE CHAIRMAN DUDLEY. He warned—he gave some veiled warnings.

MR. TARULLO. —tried to give some notice of the way the Committee was thinking. And indeed, this guy said that, given how opaque Greenspan normally was, he really took notice of the fact that the Chairman was pretty direct. The moral he drew from that story was that better communications, as an institutionalized matter, whether in 2004 or 2013 or 2014, were not likely to have a substantial difference, and that there still is likely to be a fairly strong reaction from markets. Do you guys have a different understanding of what happened before the FOMC decision in 1994?

MR. ENGLISH. I think I would read it a little differently. I agree that in '94, Chairman Greenspan provided some hints that some tightening was coming, and that those were not read correctly by the markets, but the example from 2004 is that you can in fact communicate about this, that forward guidance can work. That's not to say it's easy. That's not to say the

Committee will necessarily get it right. But I think communication can be successful in terms of setting the stage for what the Committee is trying to achieve, and when they are likely to do it—and thereby avoid a confusion or a surprise of the sort that happened in '94. There could still be a surprise if the data surprise all of you. The economy takes off, and so you find you have to move more quickly than you had thought. But you can communicate pretty clearly and have, in some sense, communicated using the thresholds, for example, about what you are looking for. So markets should be able to take account of that and to adjust.

MR. TARULLO. That actually led to my other question, which is the degree to which all three of the precedents—1994, 2003, and 2004—are on point, as one might say, for an LSAP purchase decision as opposed to an interest rate increase.

MR. ENGLISH. I'm sorry. I don't think I understood the question.

MR. TARULLO. To what degree does it matter for thinking about the worth of those precedents, positive and negative, that the decision here is about tapering or ending LSAPs, as opposed to raising interest rates? It may make no difference, it may make a lot of difference, or be somewhere in between.

MR. ENGLISH. It makes the communication a little harder because it's an unusual tool, and therefore people are less used to thinking about it and the communication is probably a little more difficult. But I think the basic lesson from these past cases is the same. What you want to do is try to be clear about your intentions and as clear as you can be about where policy is headed. That will be something that markets will take account of, and it won't be a surprise when the Committee takes various steps, and that will help.

CHAIRMAN BERNANKE. Vice Chairman.

VICE CHAIRMAN DUDLEY. Let me come back to '93 and '94. I spent a lot of time on the trading floor in those two years. Ninety-three was a huge bull market in bonds, and bond yields were still, as you can see in the chart on page 2, at levels where there was still a possibility of bond yields falling a lot further. And so '94 was bad in part because there were a lot of people who thought the bull market in bonds was going to continue in '94, and then they were very strongly disabused of that notion. I would argue that today's environment is quite a bit different. There aren't a lot of people out there arguing that the 2 percent 10-year yield is going to fall 100 basis points from here. So I think it's a very different environment, in that sense.

CHAIRMAN BERNANKE. President Evans.

MR. EVANS. Thank you, Mr. Chairman. Governor Tarullo asked which of these episodes are instructive for the current decision about LSAPs, and I was going to mention this in my go-round, but it seems more live at the moment. I sent an e-mail to Bill English and the staff to talk about the June 2003 episode, and my own take on the characterization of that was somewhat different than the way they read it. Chairman Bernanke, you were an important element of what was going on back in the spring of 2003. But it seemed to me as though the big increase in Treasury rates following the June 2003 meeting was one of great disappointment by financial markets, not just because they got 25 basis points less than they were expecting, but also because they had positioned themselves in bond markets for future asset purchases, which speeches by Governor Bernanke and Vince Reinhart—we don't send Bill English out to give speeches on policy, do we?

MR. ENGLISH. Thank goodness—no. [Laughter]

MR. EVANS. Presumably, it gets great attention when somebody like that shows up at NABE and starts talking about, "Well, something that could happen is, we work the long end of

the yield curve.” So I think the markets really started positioning and thinking about this.

Around Chicago, when we talk about the May 2003 meeting—which I didn’t see—the FOMC patted themselves on the back and practically gave themselves high-fives after taking no action on the funds rate but saying that there was a small probability that inflation could be uncomfortably low. They eased monetary policy with words alone. So, in June, they were bold and thought they didn’t have to do as much. They did 25 instead of 50, and then they didn’t say anything about asset purchases, and financial markets punished them in the market. My interpretation has always been that we got “considerable period” because there wasn’t follow-through from the expectation of asset purchases in June. To me, that’s a cautionary note for the current period.

CHAIRMAN BERNANKE. Okay. Any other questions? [No response] Good. Let’s turn now to the go-round, and I’ll start with President Bullard.

MR. BULLARD. Thank you, Mr. Chairman. We can get down to work now. I have several points I want to stress today. First, some remarks concerning the efficacy of asset purchases. I see asset purchases as a potent but unwieldy tool for influencing inflation expectations and inflation in an environment with short-term nominal interest rates near zero. I think the evidence from the second round of quantitative easing is clear and convincing on this point. As many of you recall, during the fall of 2010, nearly all measures of year-over-year U.S. inflation were low and falling, and TIPS-based measures of inflation expectations were also low. With the adoption of the QE2 program, inflation expectations moved higher and actual inflation followed, with headline year-over-year inflation moving well above our 2 percent target and core inflation hitting 2 percent. This occurred during a period characterized by even higher unemployment than we have today. The QE2 program ended in the summer of 2011 and was

eventually replaced with the Twist-type program, which altered the assets held by the Fed without changing the size of the balance sheet. This program, in my view, has been ineffective in influencing inflation expectations in the United States, and inflation has generally drifted down during the period in which that program was implemented. The Committee's current policy is closer to the QE2 regime, but only since the recent December meeting. Accordingly, I now expect higher inflation expectations and inflation in 2013, along with the lower short-term real interest rates that would be associated with that outcome. My account of the efficacy of asset purchases differs from the one given in the staff memo by Durdu et al., "Evaluating the Efficacy of the Federal Reserve's Large-Scale Asset Purchases." The authors of that memo rely heavily on the FRB/US model and freely admit that the model is not really designed to handle or evaluate alternative types of monetary policy such as the asset purchase programs. I think the estimates there are interesting but far from definitive.

Let me now turn to the costs of balance sheet expansion. I think the most significant cost of further balance sheet expansion is one not listed in any of these memos. Since it has, so far, gone unnamed, I will give it a name. It is called "uncharted territory." My good friend Richard Fisher refers to it as "terra incognita." The basic idea is that, with further balance sheet expansion, we are marching further into uncharted territory and the consequences are almost wholly unknown. The models that we have are based on data from more normal times and so tend to underplay the possibility that disaster lurks around the corner. Certainly, many of the Committee's critics argue exactly this and fully expect that current policy hopes will end in tears. This consideration argues that we should not march further into uncharted territory than we feel we absolutely have to.

I see some of the other costs that are directly dealt with in the memos as being of increasing importance going forward. I am sympathetic to the argument that we are almost surely fueling financial excess with our current policy. Yet as of now, I do not see price misalignment so severe as to warrant a change in the direction of policy. I see the possibility of a sharp and unpleasant rise in longer-term interest rates as somewhat more likely than the staff memo by D’Amico et al., “Assessing the Risk of a Substantial Increase in Long-Term Interest Rates,” suggests. Again, I think most of the data on which this analysis is based are from more normal times, and so the memo may be underplaying the danger to some extent. After all, financial market participants today are freely referring to a “bond price bubble,” which could easily burst at some point. I’m concerned that our plans about what to do in such a scenario are only rudimentary at this point.

Let me now turn to remittances, which I think are a key issue for the Committee. The larger balance sheet on which we are now embarking is making it much more likely that we will enter into a time in which remittances to the Treasury will be zero for a considerable period, during which we will have to use the dubious technique of reporting a deferred asset. I see this scenario as unnecessarily exposing the Fed to political risk. Fortunately, there are a lot of good ideas that would likely mitigate this risk contained in the excellent staff memos by Allison et al., “Alternatives for Federal Reserve Remittance Policy,” and by Chaboud and Leahy, “Foreign Central Bank Remittance Practices.” The Chaboud and Leahy memo makes it clear that many central banks construct a remittance policy that sensibly prepares for possible losses and does not allow the central bank to get into a compromising position with respect to the rest of the government or governments with which the central bank interacts. This seems like an exceptionally good idea to me. I recommend that we take this entire issue off the table by

adopting one of the remittance-smoothing strategies suggested by the Allison et al. memo or, possibly, one of the foreign central bank strategies discussed by the Chaboud and Leahy memo. If we could get the remittance issue taken care of through remittance smoothing, we would be able to better focus the debate concerning additional QE on macroeconomic issues instead of political or optics issues.

I think remittance smoothing is a superior and easier strategy to adopt than trying to make the case that there may be macroeconomic benefits to certain monetary policies that greatly outweigh the losses reflected in certain exit scenarios, as discussed in the staff memo by Clouse et al., “Fiscal Implications of Additional Large-Scale Asset Purchases for the Federal Government and the Federal Reserve.” Even though members of the FOMC may feel that the benefits of current policy are large and therefore dwarf seigniorage concerns, it is, I’m afraid, a fairly simple matter for many outside the Committee to argue that not only is our policy not beneficial, but it is also downright detrimental to U.S. macroeconomic performance. To be fair, there are a lot of macroeconomic views out there, and they often have at least some validity. Of course, we could enter that debate and attempt to win it, but this does not strike me as a good method of addressing the zero-remittance issue, especially when it is so much simpler to smooth remittances and, most likely, eliminate the issue altogether.

Before I leave the remittance issue, let me also mention one other point. It is sometimes said that if we withhold, say, \$10 billion against possible future losses in a year, then the Treasury will have to borrow that much more, all else being equal. This is, of course, true, but it’s also true during any period in which the Fed is claiming a deferred asset and therefore remitting nothing to the Treasury. In those periods, the Treasury would again have to borrow more than otherwise, all else being equal. For this reason, I think it would be a better policy to

remit an amount that is likely to remain fairly constant during the entire period of the enlarged balance sheet, as it would facilitate borrowing and spending plans for the government. And perhaps, as an additional comment, it would more accurately reflect the true amount of revenue that's coming in, on average, over a longer period of time. I also do not think that adjustments to the exit strategy are ultimately likely to be sufficient to deal with this issue. These are discussed in the memo by Femia et al., "Exit Strategy Considerations."

Let me now turn to the issue of the way forward with respect to the asset purchase program. My preference continues to be that we adjust the program modestly in response to incoming information. Small adjustments to the flow rate of purchases, perhaps in the neighborhood of \$10 billion to \$15 billion at any one meeting, would acknowledge incoming data in cases where the Committee felt that some progress toward ultimate objectives had occurred. Just to provide something tangible, we might think in terms of a reduction of \$15 billion in the flow rate of purchases for each one-tenth of 1 percentage point reduction in the unemployment rate. That would have purchases ending when unemployment reaches the low 7 percent range. Because there are other labor market considerations, as outlined earlier by Governor Tarullo, I do not think that we could actually adopt such a rule. So I suggest it only to put some context around my proposal to react to incoming data with a tangible policy move. One consideration that I think is important in this context is that something like substantial labor market improvement does not arrive all at once. As data arrive on the economy, it is important for the Committee to react. Otherwise, the private sector is left guessing about what the Committee is thinking. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. President Plosser.

MR. PLOSSER. Thank you, Mr. Chairman. I want to thank the staff, as was done earlier, for all of these memos. A lot of good and thoughtful work went into them. It was quite an effort, and I appreciate it very much.

Before getting to the questions, I'd like to make one general comment. Going forward, I believe it's very important for us to begin thinking about our exit in terms of contingency planning or stress-testing, if you will. I hope very much that we'll be able to make a graceful exit. What if this isn't the case? What if we need to raise the IOER and our funds rate much more sharply than is being considered in the memos? I realize that the staff puts a low probability on such an event. Such scenarios aren't that far-fetched. The 10-year Treasury yield is up about 40 basis points just since our December meeting, much more than many would have predicted.

Not long ago, like Governor Powell, I sat down with some money managers. In my case, it was 20 different managers, and I asked them what their opinions were going forward in terms of interest rates as well as financial market conditions. Every one of them—every one—expressed a concern of a potential sharp spike in long-term rates. And so I asked them what they were doing for their clients, and they said they were seeking in every way they could to go very long on credit risk and very short on duration. Now, the good news of that strategy might be that those actions by them, and others like them, may lead to rates rising sooner and more gradually, which actually would be a good thing. But I think we have to acknowledge that financial markets are not always patient. They don't always act in a linear and smooth manner. And our ability to predict movements in rates of return, or asset prices in general, is highly uncertain. The other side of the coin is that they're accepting so much credit risk that I worry about their ability to handle it should things turn sour on them. So one of the lessons from the crisis is that we have

to learn to take tail risks seriously. We not only need to think about the modal or expected outcomes but also would do well to prepare for less likely events should they happen.

Now let me go to the questions. I've argued in the past that I think the efficacy of LSAPs is quite low, especially in the current environment. The ability of LSAPs to work through portfolio balance channels depends, as we talked about earlier, on particular frictions in financial markets—that there are not enough arbitrageurs to offset the people who have a habitat. I think many of those frictions may have existed during the height of the crisis. I'm not going to question that. But it's difficult for me to see that such frictions are dominant or particularly powerful today. And the empirical studies indicate that the effects really have fallen over time over the sequence of our efforts.

I'm also struck by Jonathan Wright's study that shows that the purchases may have had, indeed, announcement effects on the term premium and that those tended to wear off rather quickly, with a half-life of about two months or so. That's an empirical proposition that requires certain types of identifying assumptions, I understand, but all of this work does, in that sense. And yet the empirical work that we're going through and the models that we're using with FRB/US to get the real economic effects are relying on some persistence of these effects for a very long time. Mike Kiley's work, for example, indicates that a sustained reduction in long rates due to a decline in the term premium has about half the effect of a similar decline in the long rate due to a decline in the short rates in more normal times. Indeed, this Tealbook suggested, as far as I could tell, de minimis effects of extending the current program. It projects that increasing purchases by \$250 billion over the \$500 billion we've already had and extending low rates to 2017 would lower the unemployment rate only by one-tenth of 1 percentage point by 2015. I think our financial market interventions right now may be generating a great deal of

financial restructuring and financial engineering, which is probably generating fees for banks and other entities. But I see it as having relatively little impact on the more macroeconomic benefits for the broader economy that we might see.

Regarding purchases of MBS versus Treasury, as I've argued in the past, I do not think monetary policy should be used to favor one sector over another. Our purchases of MBS may have lowered mortgage rates, but this has spurred a great deal more refinancing activity than lending, given the constraints to qualified buyers. So the macroeconomic impact may have been more muted or smaller than we might have otherwise expected. If we were having a large effect on housing and construction, then we may be inefficiently directing investment away from other activities. I think we then must consider the fact that there may be a painful readjustment that might set in after we remove this implicit subsidy, which could have a more damaging effect on the economy than perhaps the modest gains we've been providing through the programs.

The second question is about costs. I've already alluded to some of the cost, particularly as it pertains to MBS. More generally, we are operating, as President Bullard just said, in a highly uncertain environment. We're marching off into the unknown, using nontraditional policies with which we have limited experience. The potential costs are difficult to quantify, but I think they're real nonetheless. I want to focus on two of them. First, I continue to hear from various business contacts that the low interest rate environment is spurring institutions and individuals to search for yield. We've talked a lot about this. They may be taking on more interest rate risks or more credit risks than they can handle. I think we see some signs of these effects, as Governor Stein and President George have noted recently. And I appreciate the work being done by the staff to monitor financial stability. But the challenge is that this may be like an iceberg. What we can't see will come back to harm us and prove the most dangerous. We do

not want monetary policy to sow the seeds of financial instability by itself. I am not convinced, however, that we are doing the appropriate analysis to assess the tail risk engendered by our own policies. We focus a lot on the tail risk of what happens if Europe gets it wrong or China gets it wrong. But do we ask ourselves enough, are we engendering tail risk ourselves, and what might be the outcomes, and how might we mitigate those?

The second cost I'd like to highlight is the potential of our current policy stance to significantly complicate our exit—indeed, many of the memos are about this—and, ultimately, undermine our ability to achieve long-run price stability. Indeed, a major policy concern I have is on the implication of the interaction between our balance sheet management during exit and our interest rate decisions going forward. As the recovery strengthens, we will need to tighten policy. Should our tools not work as well as expected, there's some risk that we may not be able to fully control the outflow of reserves into the economy, resulting in a rise in inflation and perhaps even a rise in inflation expectations. This would jeopardize our credibility and our ability to achieve price stability. As I see it, the larger the balance sheet becomes, the more significant that risk becomes. Moreover, there could be increasing pressure on the Fed to avoid capital losses that would result from tighter policy. Negative remittances to the Treasury won't impair our ability to implement monetary policy, but it will not go unnoticed that the Fed is paying banks higher interest on their reserves, while forgoing payments to the Treasury at a time when the federal government is trying to reduce its deficits. These fiscal effects could be highly controversial, regardless of our own view or the smoothing techniques that we engage in. The appearance this creates will put our institution at risk. I think it's a safe bet that the prolonged period of negative remittances or near-zero remittances will lead to renewed calls to end the Fed's independence to set monetary policy. Alternatively, if we become reluctant to raise rates,

or to shed assets as rapidly as might otherwise be appropriate because of this institutional risk, we will again put our price-stability mandate at considerable risk. If we choose not to sell at all, we may avoid negative remittances, but not large transfers from the Treasury to the banks. Nor do we know if, by not selling or by selling very slowly, we will create an environment where we will have to raise the funds rate or IOER faster, or pay more for term deposits, than we otherwise would. Lots of questions. Lots of risks.

The third question is on cost mitigation. I believe we can start to mitigate the costs by beginning to taper asset purchases as soon as possible, with an aim toward ending them before the end of the year. Why tread further into the abyss? We could also change our reinvestment policy. We could consider reinvesting in shorter-term Treasuries rather than longer-term securities. I still generally subscribe to the exit strategy principles that we laid out in 2011. I think they're still basically applicable. The staff memo on exit assumes that purchases run through the end of the year and result in halted remittances for 30 months. That's a long time, which is one reason I favor ending the purchases sooner. As we go forward, I expect we will continually revise our estimates of the projected losses. It could be that we may be able to slow the pace at which we sell the MBS portfolio in order to reduce the probability of incurring deferred assets on our balance sheet. That would certainly be consistent with the principles we've laid out. But at this point, I would not want to pre-commit to that. Rather, I would like us to continue to aim toward normalizing both the size and the composition of our balance sheet and returning to a corridor system in which the fed funds rate is our primary policy instrument. And communications will be a critical part of that successful exit.

The final question concerns the path of asset purchases. As I've said, I would like us to begin tapering and end the asset program before the end of the year, if not sooner. I don't

believe the state of science allows us to write down a Taylor-like rule for asset purchases. It's extremely difficult to translate purchases into short-term rate equivalents. The types of asset purchases may matter as well. We don't know for sure. We are left with the Tealbook's forecast, which suggests that \$250 billion of additional purchases, even when coupled with a later liftoff, would yield an unemployment rate in the fourth quarter of 2015 that's only one-tenth of 1 percentage point lower. That's enough to convince me to stop at our earliest opportunity. It is not, in my view, a signal to double-down and do four times that amount of purchases in order to get a larger effect on unemployment. I don't think we know enough about that, and the risks don't justify such strategies, in my view. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. President Lacker.

MR. LACKER. Thank you, Mr. Chairman. I want to compliment the staff on the broad array of memos. I realize I said that already, but it's in my notes and the staff deserves for me to say it again.

Concerning efficacy, as my earlier questioning suggests, I think we should be relatively humble about our understanding of what asset purchases accomplish and how. I recognize that there are a number of quantitative studies of the effects of asset purchases on long-term yields, and they represent a good start on the question. Many of them find significant effects—that's clear. But someone—I think it was President Kocherlakota—referred to them as cutting edge, and the implication of that is that this literature is relatively young.

The key challenge is identification, as always, on these things. Estimates based on the LSAP period face the challenge of disentangling the pure anticipated supply effects from signaling effects—that is, the effects of our announcements on beliefs that investors hold about future economic activity and future policy. Michael Woodford emphasized this point at Jackson

Hole. This is a generic challenge for empirical strategies that focus on small windows around announcements. And what comes to mind for me is foreign exchange market interventions in which a narrow focus on the window around the intervention would find fairly pronounced effects. But I think that generally, my recollection of that literature is that they dissipate to nothing in a short time period after that—and it's what you'd expect—because nothing is fundamentally changed about monetary policy from intervening in foreign exchange markets.

For estimates based on the period prior to the LSAPs, identification depends essentially on controlling for everything else that could possibly correlate with both yields and variations in Treasury supply. And the earlier discussion, I think, illustrates how little we comprehend about Treasury debt management policy, what the determinants of that are. Yet in those regressions, we're treating that as an exogenous variable, and that's an assumption that's open to question.

As I mentioned earlier, I don't think the expectations theory of the term structure is the right theory—I believe that's a straw man for these kinds of exercises. It's pretty easy to find deviations from that. But the standard benchmark model for asset pricing would tell you that that doesn't hold, and, viewed through that lens, risk premiums depend on how investors expect real bond payoffs to vary with their future circumstances. In other words, do they think higher-than-average real bond returns are going to tend to coincide with relatively good circumstances for them or relatively bad circumstances for them? And that's going to influence whether they are willing to pay up for it or whether they need to be compensated to hold that bond. Now, this is essentially a subjective assessment by investors. It's always going to be unobserved, and it's always going to be inherently difficult to rule out the possibility that it varies in ways that are correlated with the supply shock you're modeling. And that's in a representative-agent world. If you open up the box of heterogeneous beliefs, heterogeneous circumstances that investors are

going to find themselves in, you've got a lot of degrees of freedom fighting with you on this identification challenge. So, in both cases—either the LSAP period or the pre-LSAP period—this challenge is daunting. My sense is that these strategies aren't bulletproof, and that's the sense in which I think this literature is relatively young.

As I said in the discussion earlier, I think of it as qualitative evidence. You're bringing us an account of why these purchases affect yields. And it's a story, a narrative. I think you ought to take the qualitative features of that narrative seriously as well. I understand that it operates as a heuristic to motivate the empirical work, but there are other empirical dimensions you can check on. The theory, we know, depends on the relative size of the habitat-investor sector and the arbitrageur sector. If habitat investors are small, you're not going to get much mileage out of this story. I look at the data, and it just doesn't look as though there are a lot of people who are stuck in different habitats. So I think this is a serious challenge for that account of what's going on there.

If I had to summarize, a fair reading of the empirical literature so far on the effect of asset purchases on long-term yields would go like this: If someone approaches this literature with a prior belief in supply effects, the results are likely to boost their confidence, probably a fair amount. If someone approaching this literature already places a good deal of weight on the view that supply effects are likely to be small and transitory, and not terribly consequential, they could easily come away still placing substantial weight on that view. And so, in short, I don't read the evidence as decisive. Now, as uncertain as we are about how purchases might affect yields, there's even more uncertainty, as the staff very candidly recognizes, about the effect of our asset purchases on inflation and growth. As the staff memo points out, there's been very little modeling work on this question, either empirical or theoretical. So, regarding efficacy, I think

the jury is out. There could be strong effects, but it seems more plausible to me that the effects of our asset purchases are small and transitory and thus approximately irrelevant.

Turning to costs, I think there is a political risk associated with the scenario of ending remittances and booking a deferred asset while the interest on reserves that we pay to banks is rising. I don't believe there's much we can do to mitigate this risk, aside from limiting our purchases or holding assets to maturity. The smoothing arrangements—if we were to stop remitting all that we earn to build up reserves—are going to pose just as many risks. That would just rearrange the timing of the shortfall, and it asks the Congress, invites them, to pass a law to take the part we didn't pay them to help balance the budget.

So I'm not confident we could succeed in making a smoothing strategy stick. If we could, that's a political assessment and a governance question for us. And I'm willing to be open minded about it, but I think there's a risk there that the Congress will figure this out. There are a lot of smart staffers up there who will work this out, and they just throw in a rider—"We're taking a couple of billion surplus from you." If we do confront this problem, if we get to the box where we have to end remittances and book a deferred asset, I agree that we should just explain why we think what we're doing is the right thing, and that a deferred tax asset is highly unlikely to impede our ability to conduct monetary policy effectively. The economics of that are just crystal clear, and I hope it could be effective if we ever get into that circumstance.

But even if we communicate as effectively as we can, I think we're going to get some criticism if we get there. It may be ill founded, but we're going to get some criticism if the political environment at that point in time is anything like it is now. I recognize that other central banks have managed to survive with a negative net worth, but in those cases, apparently there was broad support, or at least a fair amount of support, for what the central bank was doing.

In the United States, views about our strategy are, very unfortunately, quite polarized right now. I think that it might be ignorance or it might reflect distributional considerations on people's part, but either way, the polarization around what we have done and what we continue to do is something that's going to pose nonnegligible political risks for us. And for me, those are a bit of a reason to be cautious about further expansion of our balance sheet. The more important cost that concerns me, as I've said before, is the implication of asset purchases for our exit process. This was mentioned in Governor Powell's report in the previous round. Even in normal times, the process of withdrawing monetary stimulus is risky and fraught with the potential for inducing a little extra volatility that you didn't want to induce.

Now, one view is that our ability to raise market interest rates by raising the interest rate on reserves should give us confidence that we can manage that process at least as well as we would in normal times. That's the thesis. The question is whether the huge slug of bank reserves out there is something that alters that picture. That's the question. I think it makes common sense that the larger the supply of reserves, the more deposit growth can accelerate in a given amount of time before we recognize acceleration to have occurred and have time to react and adjust policy accordingly. That just makes common sense to me. And so, yes, we do react, and we would react if we saw those inflationary pressures emerge. But I think they can emerge more rapidly if the balance sheet is bigger. That, to me, raises additional risks, which rise as reserve account balances rise.

I recognize that assessing these risks is difficult and subjective, but my sense is that they're not trivial, and the larger our balance sheet is, the larger they're going to be. For me, the costs associated with exit risks tilt against further purchases at the present time. So, as I've said before, I'd favor moving to end them as soon as practicable. Thank you very much.

CHAIRMAN BERNANKE. Thank you. President Rosengren.

MR. ROSENGREN. Thank you, Mr. Chairman. I'll just address each of the four questions. On question 1, the Boston staff estimates the impact of asset purchases on the economy using two models: One is more structural in nature, the other a vector autoregression model. They both give results that are approximately equivalent to those reported in the staff memos. To be specific, our best estimate implies a slightly stronger impact, roughly a 25 basis point decrease in the unemployment rate for a \$500 billion purchase program. Thus, the benefits of the LSAP program include roughly 400,000 additional workers employed for every \$500 billion in purchases, returning to our inflation target somewhat more quickly, and a somewhat better debt-to-GDP ratio for fiscal authorities as a result of the lower rates and improved GDP growth. If we decide to eventually taper the program, I would prefer to taper Treasury purchases first and mortgage purchases only after we had stopped the Treasury purchases. The improvement in housing markets is partly a reflection of our actions, and I would encourage us to continue providing this support until we see much stronger growth. Furthermore, I would couple any tapering program, when that does become appropriate, with a decision and announcement not to sell MBS securities, allowing them to roll off as homeowners sell their houses or pay down their mortgages. This would both provide more stimulus and help allay concerns about the potential for capital losses and a temporary cessation of remittances. I would also note that our models do not currently see evidence of a waning impact of our purchases. As markets heal and credit-impaired borrowers get more access to auto and housing financing, the impact of our actions may actually improve in the near term. There's no reason to believe that movements in exchange rates and stock prices will have less of an impact than they did earlier.

On question 2, I see three potential costs. The first is that inflation or inflation expectations will be significantly higher than desired. This was the argument that most people were making three years ago, but it seems to have abated substantially now. With labor costs low and inflation significantly underrunning our target almost five years after we expanded our balance sheet, I do not see this as a significant risk at this time. In fact, like the Tealbook, we expect to be below our inflation target for the next several years. Had we not engaged in a substantial LSAP program, our inflation rate would be even lower than it is today. If we do not continue the LSAP program, we will continue to miss both elements of our mandate by even more than I indicated previously in the discussion of my SEP submission.

The second cost is that we undermine financial stability by our accommodative policy. However, the spread between high-yield bonds and Treasury securities is not particularly low. It appears that those rates have come down in line with mortgage rates, auto rates, and investment-grade bond rates. I do not see evidence that these rates are lower than would be expected, given the expectation that our policies will encourage more growth and somewhat-more-prudent risk-taking by investors.

While there is more issuance of below-investment-grade bonds and loans, most of this is firms refinancing for lower rates and longer terms, positioning that will make these firms more resilient and profitable going forward. While there has been some increase in mergers and acquisitions, it is well below levels of 2005 and 2006. In terms of leveraged institutions, both their capital and liquidity have been improving. I do not see outsized bets by leveraged players. Evidence from the stress tests is not indicating that leveraged firms, in general, are unduly exposed to interest rate risk. Stock prices are higher, but so are earnings. The price-to-

operating-earnings ratio is below the 20-year average despite stock prices rising significantly in the past year. Housing prices are higher but, relative to rents, are arguably still too low.

Financial stability is important and relevant, and we should monitor markets closely. However, it is not a trump card that avoids all action and obviates our responsibilities to meet congressional mandates. I see no market that is posing such a risk that it offsets the gain of 400,000 Americans getting jobs by the end of this year. While there are political risks with our balance sheet activities, there are political risks from very high unemployment, below-target inflation, and stopping our actions. Japanese central bank independence is endangered because they did too little, not because they did too much.

On question 3, consistent with some of President Evans's comments earlier today, I think we can best mitigate financial stability concerns by continuing to implement enhanced supervision. We should continue to press for important structural reforms, such as with money market funds; reduced reliance on wholesale funding, as Governor Tarullo has been advocating; and requiring broker–dealers to be better prepared for financial shocks, as Vice Chairman Dudley has recently discussed. I personally think we should be advocating for higher capital requirements for broker–dealers, as is being discussed in many other jurisdictions. I am hopeful that recovery and resolution and SIFI surcharges will result in higher capital requirements for difficult-to-resolve institutions. I would also encourage us to consider incorporating some of our financial stability concerns into future stress tests. In my view, these are much more effective financial stability tools and do not necessarily have the same negative impact on the macroeconomy as withdrawing monetary accommodation, which raises interest rates on all borrowers.

On question 4, I would continue asset purchases at the current size until the unemployment rate reaches an unemployment threshold of 7¼ percent. At that time, depending on a wide variety of labor market and economic indicators, I would determine whether the economy was progressing sufficiently to justify tapering or stopping the purchase program. Assuming that there's no strong empirical evidence of a financial stability concern that is best addressed by raising rates, aggressive policy is justified as long as we're projecting to miss on both elements of our mandate over a two-year forecast horizon. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. President Fisher.

MR. FISHER. Thank you, Mr. Chairman. By my count, we had over 50 economists prepare us for this meeting. I will do my best to summarize my views more briefly than they were able to do in those nine papers.

I do want to point out that I think President Rosengren and President Evans have raised some very important issues—that is, using our regulatory powers to mitigate some of these costs. I'm not going to address that right now. I do believe that the first round of LSAPs—especially the mortgage-backed securities, which I supported and voted for—did make a significant contribution. I also believe they have a short shelf life and are experiencing diminishing returns over time. If it appears that the previous LSAP programs had more than a modest impact, that's probably because they were interpreted as signaling a looser future funds rate policy. Bauer and Rudebusch estimate that roughly half of the apparent effectiveness of the first LSAP programs can be attributed to signaling.

With regard to the discussion we had earlier about the peak impact of another \$500 billion in purchases on the unemployment rate and the path around it, Governor Stein has made a strong case that the stimulus to investment from a lower term premium is different from

the stimulus from a lower expected path of future short-term interest rates. And if I understand it correctly, when the Board staff memo modified its stimulations to take Governor Stein's argument into account, it found that the estimated impact of the \$500 billion LSAP was cut roughly in half. So my conclusion is that there's not a lot of bang for the 500 billion bucks. My bottom line is that expectations of post-liftoff conduct of monetary policy are key, and my personal feeling is that additional asset purchases per se will play a relatively minor supporting role. I do find it plausible that our MBS purchases have had a stronger positive impact than our purchases of Treasuries. However, the scope for expanding those purchases is limited. The exit complications posed by our existing MBS holdings are considerable, and residential investment is no longer a component of demand that I believe is holding back the economy. We had substantial discussion about that during the economic go-round.

With regard to the second question, about significant costs and concerns, I think the main costs take the form of increased risks. We tend, at this table and at the Federal Reserve generally, to think in linear terms. I don't believe the world operates that way. Governor Duke talked about a seismic change in housing, and I think that illustrates the fact that things can shift quickly. My point is that, to prevent future overheating, we may have to shrink the balance sheet rapidly and/or sharply increase the rate we pay on excess reserves. President Plosser referred to that earlier. Now, the larger the balance sheet is, the more politically fraught either course has the potential to become. There are practical limitations on how quickly we can sell MBS without disrupting financial markets. According to the exhibit that was shown to us earlier, we already are the largest holders of MBS. That was your exhibit 3. We're approaching purchasing 100-percent-plus of the adjusted TBA-eligible issuance. One lesson we learned in Dallas, Texas, at least from the Hunt brothers, is that you can buy up things, but it's very hard to sell them when

you have that much concentration. It's by no means certain that these risks, of course, will ever be realized, but I think we should not dismiss the costs or minimize them.

Another risk that we need to consider is how further expansion of our balance sheet impacts inflationary expectations and, very importantly, the way businesses operate. I mentioned earlier the CEO of Apple and his rather extreme statement. I don't think he's alone. An increasing number of my business contacts report that they're making contingency plans for the possibility of future increases in inflation. If you like, a way to put it would be that these executives believe that the distribution of future inflation outcomes has a fatter upside tail as a result of our actions. I think this is picking up on President Lacker's point about tail risk.

As has been widely noted around this table, another concern is the risk of future financial instability that might arise as investors reach for yield. The biggest dangers come from leveraged investment positions, from long-term illiquid investments financed with short-term debt. I think we still don't have a very good idea of the extent of these vulnerabilities. My sense is that, as mentioned during the earlier discussion, they may not currently be large, but I believe that they're growing.

With regard to the third question—"If you listed any costs in your response to the previous question, do you believe that there are effective ways of avoiding or mitigating those costs?"—there are two things we can do to mitigate risks. We can smooth the remittances, or we can modify our exit strategy. I prefer the latter. For smoothing remittances, I considered the "average SOMA earnings" approach and this is where I would differ from my good friend President Bullard. That approach, as outlined in the staff memo on remittances policy, is a risky approach. I think it's very difficult to explain and difficult to implement, and it's an open invitation to second-guessing of Fed projections and policies. The "target surplus ratio"

approach, it seems to me, stands a better chance of success, though it, too, is not foolproof. The chief danger is that a large surplus will invite a raid by the fiscal authority. So I prefer to proceed with an exit strategy to mitigate risk.

I'm particularly concerned that, by loading up on mortgage-backed securities, we've saddled ourselves with illiquid securities that very much limit our options. I've been consistent in my warning about this, talking about how difficult it is to be on the sell side rather than the buy side. With this consideration in mind, the following is the logical, ultimate progression of balance sheet actions as we transition to normalization. First, stop adding to our MBS holdings. Second, put the proceeds from maturing MBS into Treasuries, allowing MBS holdings to shrink. Third, stop adding to net Treasury holdings. Fourth, allow Treasuries to run off as they mature. Fifth, sell securities from the SOMA portfolio, starting with those that are nearest to maturity, regardless of whether they're Treasuries or MBS. Now, that's the ultimate exit. For now, I would suggest that we begin tapering our purchases, with a goal of ending them before the end of the year.

I do want to thank Debbie Danker for getting me out of a hot spot in summarizing my approach toward tapering. At the last meeting we had, I said that I thought we should not stop purchases, even though I was not in favor of them to begin with, and that we should not, instead, go from Wild Turkey to cold turkey, but taper off in between. I gave a speech at Columbia, where I rephrased that but mentioned the same thing. Dow Jones did not capitalize "W" or "T" in "Wild Turkey." And I received a rather interesting note from Jimmy Russell, the master distiller of Wild Turkey bourbon, saying he insists that in all speeches, I put a capital "W" and a capital "T." I thank you, Debbie, for correcting the transcripts. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. President Lockhart.

MR. LOCKHART. Thank you, Mr. Chairman. I, too, want to thank the staff for an excellent set of memos that reflect a lot of hard work to give us as much as possible to go on. I have no strong objections to the conclusions of the staff memos. After reading them and discussing them with my staff, I've come away with these basic takeaways. The LSAPs to date have had some positive effect. The costs haven't really shown up yet. Whether, and how, the costs will materialize is conjecture, and there is a lot we simply don't know and can't estimate in advance in any precise way. I find it hard to treat the questions, particularly question 4, from any perspective other than my personal thresholds of comfort. There's a judgment aspect that I think can't be avoided. In the interest of time, I'm going to cut to question 4 and explain where I come out under current circumstances after consideration of all of the analysis and information provided. So I won't belabor the various aspects of questions 1 to 3.

I'm not going to push my gut judgment too hard at this meeting, but, unless things change a lot, I can't see myself getting comfortable with an LSAP program that grows the portfolio past, say, \$4 trillion and heads toward \$5 trillion or higher. Four trillion is not a hard number, but balancing out the costs down the road against the marginal benefits of a bigger program makes me skeptical of the value of letting the program run much beyond that threshold. At this juncture, I lean toward an approach that begins tapering purchases sometime later this year.

I want to say that I appreciate Governor Tarullo's intervention in the last round, where he gave his thoughts on the subject of substantial improvement. I'd like to see the Committee tackle the meaning of substantial improvement in the outlook for labor markets, perhaps at the next meeting. To my way of thinking, this might be defined by the Committee in two ways. The first is more confidence in our median or modal forecasts. That is, substantial improvement could be defined as increased confidence that the pace of progress on, say, the unemployment

rate and employment growth won't be reversed. The second definition could be an actual pickup in the outlook for unemployment to be in the low 7s by year-end. The improvement in confidence could be met, I think, in another three to six months and could provide the basis for a start to tapering. Achievement of the second definition might prompt communication that would prepare the markets for the likely end of the program over some foreseeable time frame.

I'd like to drop back to question 2 for just a second to offer my take on political risk. I don't think we should obsess about this risk, particularly at the expense of doing the right thing for the economy for the long term. As many have noted, this risk will present itself in the context of a much healthier and growing economy. Political heat and noise could undermine the institution's credibility for a time, but political heat is not the same as political action. In the economic circumstances I imagine, I don't think a bill that actually does damage to the Committee's statutory independence is likely to pass both houses and be signed by the President in the environment in which remittances might be curtailed and a deferred credit asset recorded. Also, I am persuaded that there are methods to mitigate this risk—most obviously, a change of the exit strategy—and I can see myself supporting revisiting and adjusting the exit strategy.

Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. President Kocherlakota.

MR. KOCHERLAKOTA. Thank you, Mr. Chairman. Before I answer the questions, I'd like to talk briefly about this issue of tail risk versus modal risk, which President Plosser raised. And I agree with him completely that the events of the last five or six years have really emphasized the need for us to keep monitoring and thinking about tail risk in a serious way. But where I guess I would disagree with him is that I think that taking account of tail risk in a serious way means quantifying it. It means not being content with simply saying that there are risks out

there. Every day, I drive my car to work, and there's tail risk associated with that. Thirty thousand Americans die every year in car accidents, and yet I still go out and do it. Why is that? It's because I've evaluated the risks and the mitigants for it, and I still find it useful to go out and do it. And in the framework I indicated this morning, there is a way, I think, for us to try to get around and quantify tail risk and compare it with modal risk. The punch line of the analysis I presented this morning was that right now, especially, with as much slack in the economy as we have and with as much gap as we have between unemployment and the usual measures of full employment—or, for that matter, between inflation and our target for inflation—that gap dominates any kind of probabilistic assessment you can provide for what's going to be happening in the tail associated with our programs. Anyway, I definitely agree that we have to keep monitoring and thinking about tail risk, but I also would like to move that discussion forward, beyond simply the reference to those risks, to a more quantitative discussion of those risks.

So—to move to the questions. I'd like to thank the staff, as many have done, for their extremely thorough work in describing the efficacy/costs issues associated with asset purchases. I said it in my conversation with President Lacker earlier, and I think this is true: This is cutting-edge work. It's too bad it's got to be confidential, because it would really push forward academic research in this area in a very positive way.

I'll start with the first question. In September, I thought that the LSAP moved accommodation in the right direction, and that the staff estimates were useful guideposts in thinking about the magnitudes of the effects of the LSAP on the economy as a whole. My position now is pretty much the same. President Lacker has talked a lot about the uncertainties and the challenges in the estimation here, and there are uncertainties, and we shouldn't ignore

them. The basic problem is, it's hard to decompose a given decline in the 10-year yield between the term premium and the path of expected short rates. And there might be other ways for us to accomplish a given path of expected short rates—for example, our threshold policy. Beyond that, we have little information about how that 20 basis point decline in the term premium translates into our inflation and unemployment objectives. Different views about the source of the term premium can give rise to different answers in this regard. We got a very useful memo on Friday from the Board's staff on this. Krishnamurthy and Vissing-Jørgensen have suggested in a recent *JPE* article that 10-year Treasuries might be especially valued by the private sector for their liquidity properties. In that framework, buying up 10-year Treasuries will indeed push down the term premium. But buying up 10-year Treasuries is also robbing the private sector of valuable liquidity in a way that could work against our dual-mandate objectives. So, to summarize, I do see the LSAPs as effective, and staff estimates are my benchmark measures of that effectiveness. But I see those estimates as having uncertainties, perhaps great uncertainties, about them.

Let me move to question 2. I'll talk about three distinct issues in this regard: financial stability, inflation risk, and remittances. In terms of financial stability, as I've discussed, I believe that monetary policy can affect financial stability, and financial stability can affect our mandate-relevant variables. I'm not sure this is really bound up with LSAPs, in particular. It's really about monitoring the impact of our entire monetary policy stance, including LSAPs, on financial stability. As I just mentioned, I don't see those considerations as being sufficiently material at this time to really be affecting our decisionmaking about our monetary policy stance. There may come a time when it may be material, but it is not at this time.

In terms of inflation, I would say that past staff work has given me confidence that, regardless of the size of the balance sheet, we have the tools to control inflationary pressures. Basically, if inflationary pressures emerge, we can raise the interest rate on excess reserves. That will push up on market interest rates and push down on real economic activity and prices. Well-anchored inflationary expectations suggest that we've been able to convey that confidence to markets as well.

In terms of remittances, the large-scale asset purchases took private-sector interest rate risk onto our balance sheet. Hence, when interest rates rise during our exit, our remittances to the Treasury will fall, possibly to zero. Now, I'm going to say something that is a little bit off the top of my head, so it must be taken with that in mind. But I think we have to be careful about some of the remittance-smoothing suggestions we've had, to the extent that they might actually be interfering with our ability to take private-sector interest rate risk off their balance sheet. In particular, if we smooth remittances, the Treasury has to increase their tax collections when interest rates are low and decrease them when they're high. They're offsetting what we're trying to do, in some sense, with the large-scale asset purchases. So we have to think about that interaction a little bit more carefully. For myself, I would say that I think this is just a communication issue. We need to prepare the Congress and the public for the decline in remittances and our possible use of a deferred asset. To say it's a communication issue is not to say it's an easy issue, by any means. But it's one that we just start on now and keep talking about. Mr. Chairman, you've started that process. I think that's great. My personal goal—and I encourage everyone at this table to work with me in this regard—is to make the Congress and the American public totally bored by the term “deferred asset” long before we ever use it.

[Laughter] Our field of central banking is filled with technical terms that bore people. This will

be one more of them. And I believe that, with this kind of upfront communication, a decline in remittances will not confront this Committee with any political pressures that it cannot withstand. With regard to political pressures, I cannot improve on what President Lockhart said, so I won't try. I thought he said some very wise things on that.

I am more concerned about the impact of remittance fluctuations on the consolidated federal government balance sheet. As Governor Stein has stressed today and in past meetings, these remittance fluctuations do introduce interest rate risk to the federal government as a whole. If interest rates rise suddenly, the federal government will need to raise more taxes or cut spending, either immediately or in the future, to cover the decline in Fed remittances. It's just adding up. The decline in interest rate risk in the private sector has to mean that net federal government surpluses are more sensitive to interest rate movements. There's been a little empirical work that assesses the macroeconomic impact of this increased interest rate exposure for the federal government. But it's worth noting that in the baseline models we have, like Eggertsson and Woodford's classic 2003 study of the zero lower bound, the increased interest rate exposure of the public sector has significant effects on the macroeconomy. Indeed, those effects are so large that they completely undo the decreased increase rate exposure of the private sector. As a result, LSAPs have no effect at all, including on the term premium. That said, the empirical estimates that we got from the staff work on term premium effects—and other work as well, I should say—give me confidence that the extreme characterization of Eggertsson and Woodford is not really valid in reality. But I'm not wholly comfortable with the staff's implicit—and, I would say, also extreme—assumption that the private sector's level of economic activity is unaffected by the increase in federal government interest rate exposure that the LSAP

is imposing on them. And although I am uncertain about the size of the possible effects of interest rate exposure, they grow bigger as the size of the program grows bigger.

So—mitigation. My main concern with the LSAPs is my level of uncertainty about their ultimate net benefits when we take into account the uncertainties about staff estimates and the uncertainties I've highlighted about interest rate exposure. The thing is, I suspect that if we were to spend time digging as deeply into our other monetary policy tools, like forward guidance, we might uncover other, similar uncertainties about those. The solution is diversification, which is a mitigant for when you have multiple forms of uncertainty. We use a mix of tools, as opposed to leaning heavily on one or another, to reduce the degree of uncertainty associated with our whole package of accommodation.

That brings me to question 4. I think we should be thinking about the LSAPs in the context of our entire package of monetary accommodation. There's been a lot of very thoughtful discussion around the table about what a substantial improvement in the labor market outlook means. I'm going to argue in the policy go-round that, unfortunately, "that ship has sailed." What I mean by that is, we didn't define it for the private sector, for the public, or for markets, and so they reached a definition in our absence. And we're widely perceived, I believe, as having committed to that definition. I'll talk tomorrow about what I see that definition being, but I think you can look at the results of the primary dealer survey. The concentration of beliefs in that survey really is very meaningful in that dimension. I think we have to deliver on that path of accommodation or risk losing valuable credibility.

But the good news is that we have multiple tools. So, if we wanted to taper or stop LSAPs without losing credibility, we could substitute for that lost accommodation, much as we did when we switched from a date to thresholds. We were able to do it in an equivalent way

without people worrying about losing accommodation by doing that. That kind of substitution seems very attractive in light of the benefits of policy tool diversification I just mentioned. Our goal should be to find a workable consensus approach to delivering on the promises that we've made. And the promise we made, I think, is an accommodation commitment we made in September. I see that that workable consensus could involve LSAPs in the second half of the year or tapering in the second half of the year, but it also need not. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. President Williams.

MR. WILLIAMS. Thank you, Mr. Chairman. I'd also like to thank the staff for the enormous amount of work that went into the numerous memos on this very important topic.

My views on the efficacy of LSAPs have been shaped by the large body of research on this subject by economists in the Federal Reserve, at other central banks, and in academia. I would like to comment a little bit on what President Lacker said about looking for bulletproof theories, or what I think of as the search for a true model. There will never be a true model. There will never be bulletproof theories. And I will just repeat what President Kocherlakota said. There's a lot of uncertainty about all of the policy actions that we've taken. So I think that one of the things we have to be realistic about in terms of thinking about LSAPs is that there's a body of theories, a body of evidence. Basically, my approach is to look at the body of research and see what we can draw from that, recognizing that each individual paper is flawed. But these studies almost universally conclude that LSAPs ease financial market conditions by economically meaningful amounts by lowering long-term rates, boosting equity prices, and lowering the exchange rate.

More-recent studies of LSAPs have also looked at whether asset purchases face diminishing returns, and here, again, the news is encouraging. There's very little evidence from

the research that the effectiveness of LSAPs has diminished. For example, empirical estimates suggest that the maturity extension program had financial market effects consistent with those of QE2. An analysis of our announcement of MBS purchases this past September suggests that their effect on MBS yields was at least as large as would be expected based on previous rounds of MBS purchases. Another very robust research finding is that MBS purchases have larger effects on private-sector yields and primary mortgage rates than do Treasury purchases. This strongly suggests that MBS LSAPs have an even bigger “bang for the buck” on the economy than do Treasury LSAPs.

Now, of course, quantifying the effects of LSAPs on the macroeconomy is harder than estimating the financial market effects. Nevertheless, research by many different authors, using a wide variety of analytical approaches, finds that the macroeconomic effects of LSAPs are both significant and positive. And I’ll mention that this isn’t just FRB/US. There’s work by Vasco Curdia and his colleagues at the New York Fed, using a DSGE model with a specific theory underlying it, that finds empirically positive effects of LSAPs. There’s work using vector autoregression models—a lot of different approaches. Also, I’d like to mention, along the lines of what President Rosengren said, that I think there are reasons to believe that the effects could be larger today than they were, say, for QE2, given that some of the financial frictions then holding back the monetary transmission mechanism have receded. So, from all of these studies, I conclude that our LSAP programs have been effective tools in the past, and I expect them to continue to be effective today.

Let me turn to the potential costs of LSAPs. There are legitimate concerns that low long-term interest rates could potentially contribute to reaching for yield by financial institutions, which, if left unchecked, could create risks to financial stability. We must take these risks

seriously and be vigilant for signs that they may be materializing. To this point, I find the extensive analysis regularly undertaken in the QS report and the financial stability reports that we see to be vitally important. And at this point, I would like to agree with what President Kocherlakota and President Evans said earlier about needing to link what we're learning from these QS studies and financial stability studies into thinking about what the tradeoffs are for monetary policy, along the lines of President Kocherlakota's earlier comments regarding probabilities and costs. The most recent QS report notes a few isolated areas of concern, but these examples seem to be idiosyncratic rather than systematic. For example, cropland prices have soared in several midwestern states, but this has not spread to other parts of the country. In California, the largest agricultural state in the U.S. economy—I had to get that in—cropland prices have risen just 4 percent since 2011. The difference appears to be that the prices of California-grown fruits and vegetables have been subdued relative to the historically high prices of midwestern corn and grains. So, more generally, I see no evidence that any of the idiosyncratic pockets of concern are yet spilling over to the broader economy to create systemic risks. Now, the background memo on reaching for yield also finds that the risk of a large, unexpected jump in long-term interest rates is remote. My own research with Eric Swanson, which President Fisher should find more convincing—

MR. FISHER. The Swanson part. [Laughter]

MR. WILLIAMS. —on the behavior of longer-term Treasury yields comes to a similar conclusion. In particular, we find that longer-term yields are currently—and when I say “currently,” I mean in the last year or so—much more stable than in the past because the FOMC's forward guidance has anchored monetary policy expectations so effectively. What we see in our research is that 5- and 10-year Treasury yields are not responding much to news right

now, and that really changed when we put in the forward guidance in 2011. This suggests that the chance of an unintended, outsized jump in longer-term interest rates is even smaller than the historical evidence would imply. Now, on the basis of this extensive analysis, I see the benefits of LSAPs continuing to outweigh the costs, and by a large margin. I expect that continued asset purchases will be appropriate well into the second half of this year, and, in making this assessment, I don't have a specific unemployment or nonfarm payrolls threshold in mind. Our FOMC statements have emphasized the outlook for labor market conditions as a relevant criterion, and we shouldn't change that.

According to my current forecast, I expect that nonfarm payrolls will grow at a pace of more than 200,000 workers per month in the first half of 2014, and the unemployment rate will be steadily decreasing by that time. Thus, by late this year, I expect that my outlook for the labor market will have substantially improved, and it will be appropriate at that time to bring our LSAPs to a close. Assuming that my forecast holds true, I would support tapering our purchases as we become more confident of our assessment of the outlook for labor market conditions in the second half of 2013.

Finally, it is imperative that we revisit our 2011 statement on exit strategy principles soon, as a number of people have mentioned. The fundamental principles of that statement generally remain appropriate, but our balance sheet is now much larger than it was back then, as well as being much more tilted toward longer-duration assets. This shift in the size and the composition of our balance sheet makes the stated three- to five-year horizon for balance sheet normalization no longer appropriate.

In considering revisions to the balance sheet normalization aspect of the exit strategy, a number of factors need to be considered. First, as on the way in, the pace of sales on the way out

should not interfere with market functioning. Second, the horizon over which we normalize the balance sheet affects the path of remittances to the Treasury, as documented in the staff memos. And let me emphasize that it would be a grave mistake to allow concerns about fluctuations in remittances to affect our decisions regarding the stance of monetary policy. However, within the context of appropriate monetary policy, we will have flexibility in the pace and mix of the rebalancing of our portfolio, as Jon Faust mentioned and as Presidents Fisher and Lockhart also mentioned. I agree 100 percent with President Lockhart's comments about the political risks and how to handle those. This flexibility around how we normalize our balance sheet can be used to minimize political risks associated with capital losses and zero remittances. Third, we moved away from calendar-based guidance on the funds rate. Similarly, we should jettison the three- to five-year window for the timing of our asset sales and get away from talking about calendar periods of time. Instead, we should indicate that the process of balance sheet normalization will depend on prevailing conditions. In summary, all of these considerations argue for giving ourselves more flexibility around the specifics of the normalization of our balance sheet within the general framework for our exit strategy. Thank you.

CHAIRMAN BERNANKE. Thank you. President Evans.

MR. EVANS. Thank you, Mr. Chairman. And thanks to the staff for an outstanding series of memos. I learned some things, plus there was this general good due diligence on difficult topics, and we benefit greatly from that.

On the benefits, I'll respond roughly in the order of the questions, like everybody else. In the aftermath of the Great Recession, and while monetary policy has been stuck at the zero lower bound, asset purchases have proven a useful way to provide additional needed policy accommodation. LSAPs provide two distinct channels for additional policy accommodation:

lower term premiums from the portfolio balance effect, as many have talked about, and also a potential credibility-enhancing role for our forward-guidance communications. Regarding the term premium effects, I realize that it's difficult to pin down precisely the effect of purchases on longer-term interest rates. Nevertheless, the empirical evidence suggests significant and meaningful effects. The staff has, in general, assumed that these effects would be depreciating over a particular stretch of time in a very structured way. In addition, the memos point out that these term premium effects may be reduced when general credit conditions have improved. But, frankly, I think the signaling function of LSAPs is just as important, and perhaps more so, as credit conditions improve. And I've said this many times since we started our QE2-type programs.

For some time, a number of us have argued that we should implement optimal control solutions along the lines of what FRB/US has been recommending, by announcing that interest rates would be held low for a long period of time. This argument was met with great resistance, in part owing to credibility limitations of these promises about future actions of another Committee. And, to President Plosser, I want to apologize. I didn't mean to just do a back-and-forth on your intervention about the revisions of potential output in the FRB/US simulations. It just seems to me that, with respect to the optimal control solutions, there's been quite a lot of robustness in terms of what they've indicated. No matter how the data have rolled out, they've indicated that we need to have accommodation for a long period of time. That was my main point.

Economic thresholds have increased the visibility and the objectiveness of our commitment, but it's still subject to uncertain follow-through. After all, there are more than a significant number of voices around this table that have regularly called for substantially earlier

tightening. And this is our large Committee at work. We can use additional help to signal our wherewithal to continue with the policies that we've announced as a Committee decision. Our additional asset purchases each month reaffirm our commitment to provide large and adequate amounts of policy accommodation, and this is beyond the term premium effects. The substantial size of our balance sheet reinforces our long-term, economic, contingent commitment to be there to help support the economy. I think this is a virtue at a time when the zero-lower-bound constraint is leaving us with Japan-like risks in our future. If you want to talk about tail risks, that's a big one that we certainly don't want to give any life to unnecessarily.

Resource gaps remain large, and inflation is undershooting our target and is projected to do so for some time. The benefits to getting the economy moving more strongly are so large that they virtually swamp most other concerns—as long as inflation remains within the range of our long-run price-stability goal, of course. These signaling benefits weren't included in the quantitative analysis of the efficacy of the further LSAPs done by the staff. So I think the memos potentially understate the benefits in that sense.

Now, on the most significant costs, any breakdown in market functioning that adversely impacts credit creation and economic growth would be a substantial cost. Memos on market functioning don't show anything approaching that outcome at the moment. Just showing that certain markets might have difficulties is simply pointing out that some investors are going to lose a lot of money. We all know that we shouldn't pick winners and losers, but when you look at these issues and aren't able to readily calibrate the potential damage to the overall economy, it's just natural to punt and point to individual market misbehavior. I'm not quite sure how to put that all together for the policy discussions that are in front of the Committee here. We just

have to have a better line of sight to the overall macroeconomic costs to adequately evaluate these issues, and many people have spoken out on that already.

Another potential cost is the possibility that our large balance sheet will alter the time path of our remittances to the Treasury in a way that generates a negative public reaction. I want to emphasize that all of the analysis suggests that this is merely an optics problem, at least as I look at it. This is only about accounting. The economics of our tasks and tools are unchanged. We print money, and we can do that. There are no substantive or operational limitations for monetary policy once we recognize that we can create a deferred asset with our accounting. If there are no operational limitations, then the optics problem is a matter of educating the public that we will ultimately deliver larger remittances over the life of our programs with high probability. Mr. Chairman, your comments have been very helpful in starting that conversation. And, as President Kocherlakota and others have mentioned, we would all do well to help educate the public. The Fed has independence to make the appropriate economic decisions for meeting our dual mandate responsibilities. We have independence to fight both inflation and unnecessarily high unemployment. We should not just cave to adverse public pressure when our best policies are unpopular, as we did in the 1970s, presumably. The Fed allowed inflation to get out of hand because the cure was simply too unpopular, and it took somebody like Chairman Volcker to come in and squash that. The memos describe a variety of ways we can massage the bad optics, so this is not a determinative risk, in my opinion. I was fully prepared to endorse and accept President Bullard's proposal to adopt smoothing remittances. That's probably a good way to do it. But I am a little nervous about President Kocherlakota's off-the-cuff thinking because it sounds like tapering, when you think about it. Some proposal has to be warranted there.

There's also the issue that larger balance sheets expose the Fed to larger losses if there are substantial increases in long-term interest rates. Again, if our LSAPs are effective for our overall monetary policy stance, the benefits are large. Increases in long-term Treasury rates are another cost that is more optical in nature than economic. Again, it's ultimately about remittances. Still, it's natural to be increasingly nervous as the balance sheet expands well beyond \$3 trillion. I might draw the line in a different place than President Lockhart, but I certainly take on board the fact that it makes everybody uncomfortable. Frankly, we need to consider the economic environment that generates large increases in long-term interest rates, and I think that it'll be a better one as well.

This is actually a very ill-posed question, and I was trying to get at that with my question to Nellie—and Dave Reifschneider stepped in—about what happens when the 10-year Treasury rate increases. It's a common trick question for undergraduate examinations. You must have a question like this in your textbooks, Mr. Chairman. What happens to endogenous variables when another endogenous variable changes, like long-term interest rates? It's a trick. Without greater specificity of the environment, no one true answer is correct. The risks are not created equal. So, again, if the 10-year Treasury rate goes up, we need to think about its source and be paying attention to that. If the economy is doing well, growth is accelerating. As unemployment falls, the optics of our losses will be much less important. Similarly, if safe-haven flows are reversed because of better confidence in the global environment, rates will begin their return to normal. Also, the economic environment will be better. Now, of course, a bad event would be if there's a spike in inflation due to a jump in inflationary expectations. We have to monitor that, of course. I just can't put a lot of credence in inflation expectations living a life of their own, and increasing without fundamentals supporting it, which, at the moment, doesn't appear to be

happening. We continue to be in a state of deleveraging for a lot of decisionmakers. Liquidity-trap conditions still seem important, and there's a lot of resource slack. So, for now, this is really a bubble theory of inflation, as I think about it. I'm happy to continue monitoring it and doing the due diligence, of course, but it remains a low probability. In any event, we need a coherent, general-equilibrium, holistic explanation for what happens to the economy, inflation, and markets when the 10-year rate rises and we contemplate alternative monetary policies. We can make matters worse by cutting back on accommodation prematurely in some environments.

Now, related to this issue is the cost to our communication strategy and effectiveness. Certain inadvisable policy actions could spark a large increase in long-term rates. And as I mentioned earlier, this was the point where I was going to talk about the June 2003 spike in long-term rates after the Fed didn't follow through on what markets had perceived as an expectation of asset purchases beyond what the Fed actually signaled it was willing to do. There was a bloodbath in markets in the summer. It was premature to end expected LSAPs. I can't size the market reaction in June 2013 if we do something similar. That is, the dealer survey has a median slowing date of the fourth quarter of 2013, so I believe there would be some backup, and it could be large. President Kocherlakota suggested that our open-ended LSAP announcement in September was a lot like Mario Draghi's comment when he said the ECB was going to do "whatever it takes." Well, if they think we're going to do whatever it takes, I don't think ending in June is what that is. So I can't size that.

In terms of mitigation, I think I've talked about that. I believe the risks are manageable.

In terms of my appropriate path, I've talked at length about this. I don't really have to belabor this, but I think we should continue. My stopping rule is a substantial and sustainable improvement in the labor market. I've said that it's about 200,000 per month on payrolls. That

ought to be associated with a decline in unemployment and corroborating improvements in labor indicators, as Governor Yellen indicated in her very good speech, as well as confidence that growth is going to pick up. I think that as we move through 2013, we'll be faced with a still-uncertain economic outlook, notable downside risks, and low inflation. So, accordingly, my SEP submission assumes that the open-ended LSAP program will continue into early 2014.

Purchases could total up to \$750 billion more than the Tealbook assumption. I was Participant 1, if anybody cares. Thank you very much.

CHAIRMAN BERNANKE. Thank you. President George.

MS. GEORGE. Thank you, Mr. Chairman. And my thanks, too, to the staff. The memos were helpful in shaping my thinking on this issue.

The Board staff's memos and work from my own staff on the efficacy of asset purchases suggest that the use of this policy tool may be particularly effective at the zero lower bound when risk aversion is high and markets are highly strained and segmented. And indeed, I think the early rounds of asset purchases eased financial conditions, reduced market strains, and stabilized declining longer-term inflation expectations. Efficacy associated with the current asset purchases in terms of real effects in reducing unemployment is harder to evaluate, I think, especially with market strains having been diminished and only five months of experience with this current program. My own view is that its benefits may in fact be positive but modest. Particularly with forward guidance now based on thresholds, the strength of the signaling channel from these purchases seems likely to have been reduced.

In terms of costs, I'm concerned with each of the issues analyzed in the Board staff's memos, notwithstanding the solutions or mitigating actions offered to address them. Our limited experience with asset purchases raises the risk of these potential costs such that any one of them

could prove greater than expected or fail to mitigate as planned. Two issues, in particular, concern me. One is market functioning, and the other is persistently low interest rates. The staff analysis on market functioning focuses on the current market dynamics of purchasing assets and offers reasonable assurance, I think, about the capacity to continue with the current program. My concern about market functioning, however, relates more to the potential complications associated with the sale of MBS once the Committee begins to remove policy accommodation. The second potential cost that warrants further analysis, I think, is the cost of persistently low interest rates and the risk associated with a possible sharp rise in long-term rates. The staff's analysis shows that a sharp rise in long-term rates is possible and would not be unprecedented relative to previous tightening cycles. So it is a factor that I see as a risk to financial stability and broader economic activity.

As we continue to add reserves to the banking system, I do see these costs and associated risks increasing materially, as well as our ability to effectively drain reserves when the time comes to begin raising rates. The current program also has called into question the feasibility of our June 2011 exit strategy, and recalibrating that exit strategy will be challenging and involve a number of tradeoffs related to reputational and political risk.

The staff memos, I think, also offered reasonable ways of avoiding or mitigating costs associated with asset purchases. In terms of the exit strategy, it seems clear that selling our portfolio of agency mortgage-backed securities could result in a sharp jump in rates and possibly impair market functioning, as well as be counterproductive to our efforts to support future economic activity and stable prices. Although I am uncomfortable with holding these mortgage-backed securities on the balance sheet, I do think we will have to consider modifying the exit strategy to hold these securities until maturity in order to minimize the noted risk. In the near

term, I favor shifting the mix of purchases toward Treasury securities to mitigate risk associated with market functioning in the agency MBS market, where our current pace of purchases is likely to outpace gross issuance sometime this summer. Adjusting the mix of purchases would also diminish our allocation of credit to the housing sector. Lastly, risk associated with exit could also be further mitigated if we had a properly functioning corridor or floor-type system where the IOER rate served as a firm floor to the effective funds rate.

Finally, my preference for the path of asset purchases would be to signal our intent to end these purchases this year, given the economy's recovery and continued improvement in the labor market. I would prefer a strategy that starts tapering purchases and tilting the mix toward Treasuries. Thank you.

CHAIRMAN BERNANKE. Thank you. President Pianalto.

MS. PIANALTO. Thank you, Mr. Chairman. I also want to thank staff at the Board and the New York Fed for their work on the memos that analyze many of the important questions surrounding asset purchases. I found them very helpful.

Turning to the questions, the evidence summarized in the memo on efficacy shows that asset purchases affect asset prices and, in turn, stimulate economic activity and inflation. In my reading of the evidence, the first piece of the transmission mechanism is the easier one to evaluate. LSAPs still appear to affect interest rates and asset prices in the current economic and financial environment, given the recent movements in MBS yields and mortgage rates. While I agree that the second piece of the transmission mechanism, the effect of asset price changes on economic activity and inflation, also works, the uncertainty about the strength of this channel is very high. We simply don't have enough historical experience with asset purchases to be able to

precisely pin down the magnitudes of their economic effects or the magnitudes of potential changes in effects.

Turning to the questions regarding costs, based on the thorough analysis in the memos, it seems safe to conclude that, at this point in time, asset purchases haven't yet led to some of the potential problems that I've raised in recent meetings, and I take some comfort in those findings. However, there are three potential costs to asset purchases that remain a source of concern to me, particularly in light of continued expansion of our balance sheet. First, even though financial stability is not a risk today and it's not the most likely future outcome, the tail risk to future financial stability remains, for me, an important potential cost to asset purchases, as others have pointed out. From the CCAR work that's been done, banks seem to be able to withstand several key risk events. But the risk events, like those evaluated in CCAR's bank analysis, can have some systemic effects on the nonbank components of the financial system. In addition, we could experience a tail risk event outside of the scope of the ones we know to consider. History shows that how tail risks will play out, like the events of the housing bust, are often impossible to see until after the fact.

Second, I'm concerned that additional asset purchases will complicate our current exit strategy, potentially making monetary control more difficult. For example, a larger balance sheet will require larger asset sales, which would have a bigger effect on interest rates as the stock effect of purchases reverses course. The financial stability risks associated with large interest rate moves may make us more hesitant to sell assets and therefore make it more difficult to control reserves and interest rates. Furthermore, our other reserve management tools may not work as we expect, given today's high level of reserves. In April 2011, memos from System staff emphasized that, to use the IOER to reasonably control the fed funds rate, we would need to

use term deposits and reverse repos to drain a sizable amount of reserves. At that time, our balance sheet stood at \$2.7 trillion, and total reserves stood at \$1.5 trillion. Back then, assuming that we would gradually sell assets and that our balance sheet included shorter-term assets that would roll off quickly, we expected our reserve-draining tools to be adequate. Today the Tealbook projects that under alternative B, our balance sheet will rise to \$3.5 trillion at the end of this year and reserves will rise to \$2.1 trillion. Given these very large changes in our balance sheet and reserves, it's not clear to me that the tools we have will be sufficient to drain reserves as much as we will now need to in order to achieve a sufficient degree of control over short-term interest rates. The challenge will be even greater if we purchase more than the Tealbook projects or if we eventually decide to either not sell assets or sell them at a slower pace than we had in mind two years ago.

Finally, I'm concerned with the potential severe political costs of capital losses and future remittances falling to zero for an extended period. While we could certainly point out the cumulative net benefits of our programs, as we've already begun to do, we could still come under difficult, if unjustified, criticism.

I have a few suggestions for mitigating the costs that I've just described. The most obvious—and, clearly, the most controversial—way to mitigate most of these costs would be to limit the expansion of our balance sheet. To reduce the risk of future financial instability, I believe that it would be helpful to work with other regulators to go as far as we can to extend the CCAR-type analysis of adverse scenarios to nonbank portions of the financial sector. To address the possible complications to our exit strategy, it would be helpful to revisit the principles of our strategy and the efficacy of our tools and to make adjustments as necessary to ensure that we have an adequate degree of monetary control. And, finally, with respect to the political risks

associated with capital losses and remittances, I would suggest that the Committee have a conversation about those risks and the options for mitigating them. Several options were offered in the staff memos. I think we should see if there's a consensus around this table about any of those options before we consult the Congress.

Responding to the fourth set of questions, in my view, the relative costs and benefits of further asset purchases, and the outlook for the economy, warrant a program that's closer in size to the one assumed in the Tealbook, which is smaller than many financial market participants now expect. Assuming that the cost–benefit balance doesn't shift materially in coming months, I would adjust the program following some further improvements in the outlook for labor markets and the broader economy. More specifically, I think that six to nine months of average job gains of around 200,000 per month would constitute a clear improvement in labor markets. As I mentioned in the earlier go-round, we've already seen five months of average gains of about 200,000 per month. If that pace of job growth holds up in coming months and we continue to see other signs of improvement in labor markets and the broader economy, I would slow the pace of purchases. And I'll have more to say about the specifics of that in tomorrow's policy discussion. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. Vice Chairman, you're up.

VICE CHAIRMAN DUDLEY. Thank you, Mr. Chairman. First of all, I want to thank the staff for all of their work—a lot to mull over and chew on. I also want to highlight one more memo. That's the one from the New York Fed staff. We decided that it shouldn't be an official memo, because there were too many memos already. But I thought it was a very careful analysis of the issues in a more formal framework, and that's why I sent it around to people. There are three key takeaways from that memo that I think are worth highlighting. The first was, if the

goal is to replicate the degree of accommodation similar to an unconstrained interest rate path, the analysis in that memo points to asset purchases consistent with \$1 trillion, alternative A, rather than \$500 billion, alternative B. The second key takeaway is that if you become more certain about efficacy and costs—and I would argue that we have become more certain about efficacy and costs—less uncertainty, with no change in the mean, implies that you should do more, not less. And, third, if the purchases are less powerful in terms of their impact on the yield curve and on financial conditions, it's not really clear what to do, whether you should do more or less. It really depends on where the marginal cost curve lies relative to the benefit curve, and so you have to make some pretty significant conclusions in that respect.

Now, turning to the questions posed, I certainly believe that asset purchases do support economic activity through their effect on financial conditions and through financial conditions to the broader economy. But I also think there's a separate announcement channel that affects household and business confidence and that also supports growth. While the efficacy memo focuses mainly on the point estimates of LSAPs on term premiums and, by extension, on the trajectory of unemployment and economic growth, I would actually put my emphasis a bit elsewhere. In thinking about efficacy, I would put as much weight on the impact of the program in changing the probability of tail risk events, such as getting stuck in a debt-deflation trap, as on the incremental impact on the modal outcome. In my mind, reducing the probability of a Japanese-style outcome by 10 or 20 percentage points may be more important than pushing down the modal forecast of the unemployment rate by a few tenths of 1 percentage point.

So the key question, to me, in terms of answering the questions is, how have the efficacy and costs evolved since September relative to the expectation that we had at the time when we initiated the latest program? After all, I don't think the outlook is materially different since that

period of time. We've had slightly stronger data recently, but we've had greater fiscal drag than anticipated. So the track of the outlook seems to be probably the same. There's really no reason to adjust the program, in my mind, due to changes in the outlook. If we hold the outlook constant and just look at the impact of the purchase program itself, I conclude that the efficacy has been as high or higher than I would have expected in September, and that the costs have been as low or lower than expected. So that doesn't point to stopping the program now in any way.

Let me explain the reasons for these conclusions. As I see it, efficacy has two components other than the outlook itself: the effect of the purchases on financial conditions and the effect of financial conditions on the economy. So it seems to me that our latest purchase program has been associated with a substantial easing in financial conditions. We've seen higher equity prices and narrower credit spreads. And we saw that the resumption of additional agency MBS purchases in September has pushed down MBS yields and lowered the MBS–Treasury spread. With some lag, much of the drop in yields was ultimately passed through to primary mortgage rates. Although I expected both outcomes to occur, there was some uncertainty about whether they would occur or not. Now that that residual uncertainty has been resolved in a favorable way, I judge that the efficacy has actually been higher in some sort of expected-value sense.

Meanwhile, the new information on the effect of financial conditions on the real economy, I think, is also becoming a bit stronger than I had expected. Since September, we've seen considerable strength in the interest-sensitive sectors of the economy—including housing, autos, and durable goods—in spite of the uncertainty and drag from fiscal policy. Improvement in these sectors suggests to me that monetary policy may be gaining additional traction. This

increased impact of financial conditions on economic activity is important because it may suggest that the benefit from a given amount of asset purchases has increased.

On the costs side, my conclusion is that costs have turned out to be no greater than I had anticipated, and because I now have less uncertainty about these costs, they're lower in a risk-adjusted sense. So let me start with the three commonly cited potential costs: the impairment of market functioning, the unanchoring of inflation expectations, and threats to financial stability. As Lorie Logan reported earlier, metrics such as trading volumes, bid–offer spreads, failures to deliver securities, our own ability to execute transactions—all of these things indicate few difficulties. In fact, on some of these metrics, market functioning has actually improved a bit over recent months. Now, of course, we're going to have to continue to monitor that, particularly if a rise in interest rates leads to less MBS issuance, but so far, so good, with respect to market functioning. In terms of inflation expectations, the wide range of measures remains well anchored, well within the historical ranges of recent years.

Now, in terms of financial stability cost, I think that's more difficult, but even here, it's not clear to me which way the sign goes. Do our purchases increase or reduce financial stability risks? On the one hand, the information received since September suggests that there should be slightly greater reason for concern about potential excesses in certain corners of the financial markets. In particular, in some areas of the fixed-income market—notably, high-yield bonds and leveraged loans—they do seem to be somewhat frothy. However, I view the expected cost to society from bad outcomes here as relatively low. The broad and rapid credit creation associated with the most dangerous types of asset bubbles has been absent. The sizes of the asset classes in question are relatively modest, and most of the investors in these assets are not highly leveraged. So, if asset valuations in these markets were to adjust sharply and some investors experience

losses, I don't think that's going to generate the type of shock that would threaten financial stability. Also, there's a potential risk to financial stability from a sharp upward adjustment in long-term interest rates and many people have talked about this. First of all, I don't think this risk has changed much since September. I believe this risk has been around for quite a while. In fact, I would argue that it might be even a little bit lower now than it was in September, given how much attention it's getting. Most of the big shocks to the system occur when people don't anticipate the risk. This risk has been the most remarked-upon risk that I see in the financial community currently. Also, as the staff pointed out, I think it's important that some of the risk to a spike in yields from convexity-related hedging should be lower now than in past cycles, given that we hold a good chunk of agency MBS.

In terms of what we can do about these financial stability risks, I think they can be managed in a number of ways. First, by good communication, we can reduce the probability of a spike in bond yields. The sharp spike in 1994, in my opinion, was due in part to poor communication from the Fed. The market anticipated roughly 150 to 200 basis points of tightening that the Fed never delivered, and I think that was an important factor in why bond yields overshot on the upside. Second, we can also take steps to reduce the consequences of such a spike in bond yields. We can continue, through our supervisory oversight, to ensure that the financial institutions we regulate will not be overly vulnerable to a big spike in long-term rates, and the CCAR has gone a ways toward doing that. Also, we do need to pay close attention to the nonbank sector. The mortgage REITs do bother me in terms of what they are and their business model. I think that's a vulnerability. And bond mutual funds and bond ETFs are something that we also have to keep our eye on.

On the other hand, there is a financial stability case for doing a greater amount of asset purchases. To the extent that risky behaviors and incipient asset price bubbles are fueled by the expectation that interest rates will be low for long, it seems to me that asset purchases that strengthen the economic recovery and bring forward the date of liftoff could actually promote financial stability. Also, to the extent that asset purchases increase the likelihood of a sustainable economic recovery, to me, that reduces the financial stability risks associated with a Japanese-style outcome of chronic deflation.

Now, although the costs of the program to date appear to be well contained, it's also true that the costs increase as the program gets larger. So I definitely have a cost curve that goes up with the size of the program. And in part, this is due to the fact that, as the balance sheet increases in size, the risk of a period of low or zero remittances to the Treasury also increases. I'd like to make three points here. First, the potential impact of the purchase program on future Fed remittances was known when we embarked on the program. So there's no new information here. The outcome depends on how the economy evolves, how we respond, and whether we decide to sell long-dated assets in our portfolio or not. Second, I think it's important not to put excessive weight on the possibility of a period of zero remittances. That's not what our mandate is. Our mandate is economic, not fiscal. Our job is to return the economy to full employment and price stability. Third, in considering the fiscal consequences of our actions, I really do think that looking at what happens to remittances is much too narrow a perspective. As the Chairman has pointed out, what really matters is what happens to the federal debt-to-GDP ratio over time, and the staff memo that Jon Faust talked about was pretty convincing. Under a pretty wide variety of scenarios, our actions are likely to lead to a lower federal debt-to-GDP ratio than would otherwise be the case. So, when I look at the whole issue of remittances, I conclude that

the better choice for the Fed is to pursue a policy that best achieves its mandated objectives and puts the U.S. government in a better fiscal position overall. That dominates a policy of fewer purchases, especially if the primary motivation is just to have to avoid explaining why remittances may have fallen to zero for a short period of time.

Finally, on the costs side, I do think there's an important cost that we need to focus on, and that's the cost of prematurely pulling back on our asset purchases, doing so in a way that we can't justify in terms of the economic outlook. If we do that, I think that really would generate a very large cost to our credibility; our credibility is important in itself, but impairing our credibility would also undercut the power of our policy tools in terms of our ability to affect future expectations. And that impairment of our credibility would affect not just this cycle, but also future cycles. So, doing something that impairs our credibility is a really bad place to go.

What path of purchases do I see as appropriate going forward? That obviously depends on how the economic outlook evolves. If the economy falters, this increases the benefits from continuing the program. If the economy picks up speed, obviously the benefits from asset purchases falls somewhat. I'm going to try to be pretty precise here about what I think we should do. If labor market conditions were to continue to improve along the pace of the last few months through the first half of the year, and I was confident that this was likely to continue in the second half—in other words, my forecast for the second-half GDP growth was, say, 2½ percent annualized or higher—then I would be prepared to support ratcheting down the pace of purchases at the June meeting a bit—to maybe \$60 billion a month or so. And if we continued on the same trajectory—still 200,000 jobs a month, the economy looks fine, confidence in the outlook continues to improve—I could see turning it down again in September and ending at year-end. If we really did that, our total purchases in 2013, by my calculations, would be \$780

billion. I think we could do this in such a way that it would be a very positive narrative: more confidence in the labor market outlook leads to a winding down of asset purchases. So that's all pretty positive.

Now, if we fall short of this sort of improvement by June—and there's a risk of that because we have large amounts of fiscal restraint, so I'm not certain that we're going to achieve this threshold—then I would keep the purchases at the same pace through September. Once we get to September, I think the impact of the fiscal restraint should lessen, and so then I'd be more prepared to contemplate ratcheting down, even if we had a little bit less forward momentum. Obviously, if the economy is really disappointing and we don't achieve any of these thresholds, then I think what we're going to have to do is come up with some other means of adding accommodation. And what we need to do is prepare for this possibility, even though I don't think it's the most likely outcome. Until I see what the best alternatives are that we can pivot to, I wouldn't want to say what precisely the right time is to end the asset purchase program. I want to know what the alternatives are.

In terms of where the market is, I think the market view has expectations of future asset purchases that are higher than where the Committee is. So, Charlie is at the high end at \$1.25 trillion and the market expectations, I believe, on the primary dealer survey were about \$1.1 trillion. I think if you took the whole Committee, it would be somewhat less than \$1.1 trillion. I asked myself the question, why is that? And I think there are a couple of reasons for that. First of all, a lot of market participants, for some reason, focus on the idea that substantial improvement in the labor market outlook requires us to reach a 7 percent unemployment rate, and I don't think that's really quite right in terms of what we actually communicated. We talked

about substantial improvement in the labor market outlook, not substantial improvement in the labor market outcome.

So I think it would be useful for us to start to carefully adjust the market's view, and what I would suggest doing is trying to emphasize that what matters is our expected improvement in the outlook and our confidence in the improvement in the outlook. As we become more confident in the improvement in the outlook, we can then gradually ratchet down asset purchases. If we can get people divorced a little bit from this 7 percent number for the actual outcome, we can start to reduce the expectations in the market without doing damage to financial conditions or the broader outlook for economic recovery. That's it. Thanks.

CHAIRMAN BERNANKE. Governor Yellen.

MS. YELLEN. Thank you, Mr. Chairman. And I, too, want to thank the staff, who has utterly outdone itself to prepare us for this discussion.

Turning to the specific questions, the staff discussion of efficacy and a range of observations leaves me convinced that our asset purchases are serving to lower unemployment and prevent inflation from declining more substantially below target. It's plausible that the effects of our purchases were larger in the first round of LSAPs, because at that time, they contributed crucially to the functioning of a range of financial markets. In addition, they lent important support to our forward guidance for the federal funds rate, which, at that time, was fairly vague. But even now, I see the evidence as strongly pointing toward important support for the recovery from the sizable reductions in long-term interest rates induced by our past and ongoing asset purchases.

Our business contacts do routinely tell us that low interest rates have little effect on their decisions concerning capital spending, and that these decisions are dominated by their

expectations for global demand and uncertainties relating to policy and growth. But I see low long-term rates as bolstering the recovery in housing demand and boosting house prices. Low rates also appear to be supporting consumer durable purchases. Indeed, when it comes to housing, our purchases today may be more efficacious than they were in the early stages of the recovery, because I now see them as supporting a virtuous cycle, whereby stronger demand boosts house prices, in turn improving access to credit for existing mortgage holders. Moreover, I see no reason to doubt that our purchases are stimulating aggregate demand through the wealth and exchange rate channels to roughly the same extent as during regular times. I also agree with Vice Chairman Dudley and others that these purchases have generally improved confidence and diminished tail risks.

Turning to costs, I'm concerned about the impact of a low interest rate environment on risk-taking behavior and financial stability, but, as I'll explain, I'm not concerned about asset purchases per se. Like President Pianaalto, I'm also concerned that an exceptionally large balance sheet will increase our difficulties in controlling the federal funds rate during exit, making that process bumpier than we'd like. That said, I do not doubt our ability to tighten financial conditions when the time comes to do so.

With respect to inflation, there are those who believe that our asset purchases will surely boost it persistently above our 2 percent objective. I wholeheartedly disagree and would point out that that view is completely at odds with our experience thus far. I'm more concerned that without these purchases, inflation will continue to drift yet further below our 2 percent objective over time.

On market functioning, the staff's efforts to monitor the functioning of Treasury and MBS markets are thorough and prudent. The data they've provided reveal no evidence thus far

of any issues. If our purchases do, however, impair functioning, something that could occur if our MBS purchases rise over time relative to the size of new issuance, we'll have ample warning and can adjust our operations in response.

On Treasury remittances, I, too, am concerned that a period of low or zero remittances involves some political risks, and I'll say a few words later on some ways we could mitigate them. I do think it's important that we're now openly discussing this issue with the Congress and the public. In this regard, I think we need to emphasize the favorable impact of our asset purchases on the government's overall fiscal position—that they serve, as the staff memo shows, to significantly lower the debt-to-GDP ratio through their effect on the economy and tax revenues. And I agree very much with Presidents Lockhart, Dudley, Williams, Evans, and others who have expressed the view that concern about remittances should not be a driver of a policy we think is efficacious in meeting our dual mandate objectives.

Turning to financial stability, our staff has done an outstanding job of assessing recent developments and identifying some specific risks that are worrisome. These are risks I believe we should discuss in public, and I applaud Governor Stein's efforts to do so. There are signs that investors are reaching for yield, and I see some specific areas where the Federal Reserve and other regulators could—and, in my view, should—use available supervisory tools to address financial stability risks, as well as work together to take steps that President Rosengren listed to work to mitigate systemic risk. That said, I do not now see pervasive evidence of trends—such as rapid credit growth, a marked buildup in leverage, or significant asset bubbles—that would seriously threaten financial stability. A higher interest rate environment might diminish the incentive of investors to reach for yield, but it's a blunt and potentially counterproductive tool,

even for financial stability purposes, because higher rates would impair economic performance, creating different, but no less consequential, financial risks.

With respect to our asset purchases, as opposed to the stance of monetary policy more generally, I think the relevant question is whether these purchases are threatening financial stability, and it's hard for me to see that they are. By depressing the term premium and flattening the yield curve, these purchases are mitigating the incentive for maturity transformation and encouraging corporations and other borrowers to lengthen the maturity of their debt, thereby enhancing financial stability. Moreover, by strengthening the economic outlook, these purchases will bring forward the date at which we're able to lift off from the zero lower bound, thereby shortening the duration of the current low interest rate environment. A premature end to our asset purchases before we've seen any substantial improvement in the outlook for the labor market would not only remove support for the recovery just as it's getting under way, it would also significantly surprise markets, and it could precipitate a pronounced upward shift in longer-term rates. Contrary to our forward guidance, it could also bring forward the date at which markets expect us to start withdrawing accommodation. Of course, interest rates may also move up sharply if growth unexpectedly strengthens, but, in this case, the associated improvement in economic prospects should boost borrower quality, strengthen financial institutions, and raise expected investment returns, serving, in effect, as an automatic stabilizer.

Turning next to question 3, I believe that adjusting our exit principles would be helpful in addressing some potential costs of our asset purchase program. The staff memo on exit strategy considerations highlights that, by not selling assets, we can significantly reduce the odds of a period of zero remittances. Moreover, I believe that our MBS purchases may be the most efficacious part of our asset purchase program, and a decision not to sell MBS would diminish

the chance that our sales could fuel a sharp backup in mortgage rates during the exit. If we do revise our exit principles, I think it would also make sense to allow for the possibility of selling shorter-dated Treasury securities. Such sales would enable a more rapid reduction in reserve balances than would be achieved with a no-sales strategy, and lower reserve balances may enhance our control over the federal funds rate. As the exit memo points out, by early 2016, we would own enough Treasuries with residual maturity of zero to five years, to sustain sales at a monthly pace of \$45 billion for two years. The sale of shorter-dated securities rather than MBS would not only minimize our realized capital losses, but would also remove a comparatively small amount of duration from our portfolio, thereby only marginally reducing its stimulative effect.

On the final question, pertaining to the appropriate path for our asset purchases going forward, I would urge that we keep the promises that were explicit in our September statement. We said that we would continue our asset purchases until we see a substantial improvement in the outlook for the labor market or we learn something new and adverse pertaining to their efficacy and costs. Neither of these conditions has been fulfilled at this point. There are certainly uncertainties pertaining to efficacy, and I've voiced some concerns about costs, but based on today's discussion and review, I see nothing substantially new that we didn't know in September when we decided to commence the program. If we stop or curtail our asset purchases at this stage on efficacy-and-costs grounds, without articulating a very good reason, our credibility will surely suffer, and the credibility of our forward guidance may also be impaired. Indeed, if we stop asset purchases prematurely, citing financial stability, we face a difficult problem. Assuming that financial stability concerns flow mainly from low rates, and market

participants share this view, they will likely suspect that we will use our escape clauses to raise rates at the earliest possible chance as well.

With respect to the labor market, as I indicated in my economic remarks, I do think the degree of labor market slack has diminished somewhat since our program began, but I don't yet see a substantial improvement in the labor market outlook. The Tealbook projects that the unemployment rate will remain at its current level through the middle of this year and decline by a meager four-tenths of 1 percentage point over the following four quarters. Such performance would, in my view, make it difficult to scale back our purchases in June. That said, there is a reasonable chance, and I fervently hope, that we will actually see more-rapid improvement in labor market conditions over the coming months. If so, that would open, for me, the door to reducing the pace of our purchases, and I could certainly support a program along the general lines that Vice Chairman Dudley articulated.

CHAIRMAN BERNANKE. Thank you. Governor Duke.

MS. DUKE. Thank you, Mr. Chairman. I, too, want to thank the staff for their memos, and, unlike Governor Stein, I'm not going to critique any of them.

Taking the questions in turn, I'll start with efficacy. I'm not going to spend a lot of time on this question. I'm willing to accept that we can measure the effects of asset purchases on interest rates, exchange rates, and the stock market reasonably well. I'll just note parenthetically that if the effect is somewhat stronger when financial conditions are more volatile, this would seem to be the tool to hold in reserve just in case there's a flare-up in Europe that spills over into financial instability in the United States.

I think measuring the macro effects of changes in interest rates is much less precise. My own intuition is that there is some attenuation at work, especially as a result of tight mortgage

underwriting. Even so, I'm still willing to evaluate the costs against an expectation that an additional \$500 billion in purchases of longer-term assets will produce a 20 basis point movement in the unemployment rate and a 12 basis point movement in the inflation rate after three years. The one projected outcome that I had a bit of trouble swallowing was in table 1 of the fiscal implications memo. There, the estimate was that \$500 billion in asset purchases would lower the federal debt by \$300 billion. If that's the case, we should just buy all of it and end sequestration. I say that facetiously but also to make the point that I do think that there are limits to our ability to get overall positive results with successive purchases of assets.

So, let me now turn to the costs that I believe begin to outweigh these benefits as we approach \$1 trillion in purchases: the growing size of our balance sheet and potential market-functioning issues, especially in the MBS market. I'm especially concerned about the growing size of our balance sheet. Over the years, as we've continued to purchase assets, I've sensed a disturbing complacency that's in contrast to the very real caution that was expressed by most on this Committee in the early days of asset purchases. I think there's a difference between a \$3 trillion balance sheet and a \$4 trillion one or a \$5 trillion one, and a real difference between draining \$2 trillion in reserves and \$3 trillion; a difference between growing reserves when foreign banks are happy to absorb the increase and growing them when they must be absorbed by domestic banks; a difference between any given level of reserves when the banking system still has the capital to grow and the same reserve level when those reserves are displacing loans on bank balance sheets; and a difference between a large reserve position in a weak economy and the same position in a strong or recovering economy. I think there's still a lot that we don't know about managing exit when that time comes, and the bigger we get, the more difficult it'll be and the more critical it'll be that we get it right.

Added to all of that concern is my belief that if the central bank of the United States loses money, it will draw a political reaction. That reaction could be damaging to future effectiveness and potentially complicate the exit process. The Congress curtailed our 13(3) authority after we used it aggressively—and, I think, effectively—to fight the financial crisis. So it's not hard for me to imagine them restricting our asset purchase authority, or the authority to pay interest on reserves, if this balance sheet expansion is perceived to have ended badly. I can also imagine members of this Committee feeling a little less willing to take bold or unconventional action if such actions are already the focus of substantial congressional ire. What I have trouble imagining is a situation in the United States where, similar to the example cited in the memo about foreign central banks that had sustained significant losses, the Treasury cheerfully recapitalizes the Fed, even though only through deferred remittances, while acknowledging the benefits that have accrued to the economy from the actions that led to such losses. I suppose it could happen, but I just can't see it.

I am not as concerned about the consequences of market functioning, but I don't think they're zero. The larger is the portion of total outstanding value of any class of securities that we own, the more likely it seems that it will affect market functioning and certainly have implications for our exit. I particularly think that there's a nontrivial possibility that we'll encounter market-functioning issues with MBS purchases. All of the factors I cited in the economic go-round could contribute to real volatility, or at least unpredictability, of issuance volumes. While the market-functioning memo concluded that there were no immediate signs of impaired market functioning, it warned in several places of the potential for problems to develop in the MBS market as soon as late spring of this year. Indeed, already, the recent Desk survey does note that a slight majority of dealers rated MBS market functioning as unchanged, while the

remainder viewed conditions as worse than those that prevailed prior to the purchase program, generally citing liquidity concerns. The market-functioning memo suggests that purchases could be shifted into Treasuries, but even there it warns that, depending on the size of the increase, a reduction in the average duration of the securities purchased might be required. Wouldn't reducing duration reduce effectiveness? This risk is manageable, but it might imply less choice about the pace and composition of purchases than we think.

Our third question asked about ways to avoid or mitigate these costs. The fiscal implications memo suggests four potential mitigants for the political or reputation risk of a large balance sheet, at least two of which could also be used if market functioning becomes more of a concern. The memo suggests that communication could be used to manage the risk. I think we've begun to do this by talking about the possibility that remittances could fall to zero for a time. Such discussion is helpful and may serve to inoculate some of the criticism that may come someday. President Kocherlakota, I think having an objective of being boring is an objective that the Federal Reserve could reach. [Laughter] But I do not believe that changing the remittance policy to build up reserves is a good idea in any scenario I can think of. Right now, we're talking about the potential for an outcome severe enough to bring reputational or political risks, but there's also still a possibility that it won't. By changing the remittances to account for the worst possible situation in the future, it seems that we pull that outcome forward to make it a political reality today. At a minimum, such an effort seems to me likely to finally provide members of Congress, who would like a reason to audit the Federal Reserve's monetary policy, with a rationale to do so. The other two proposals, curtailing the program and altering our exit principles, have the potential to mitigate both balance sheet size and market-functioning risks that I've identified. I'll talk about both when I get to my preferred path for asset purchases. But

before I leave costs, I should mention financial stability and inflation. I don't want anyone to think I'm not considering either of those potential costs. I just think they're concerns surrounding accommodative monetary policy generally and not specific to LSAPs.

So, now to my preferred path. I realized as I went through this exercise that my real problem is with open-ended purchases. "Open ended" implies unlimited, and I see very real limits. All of the memos prepared for this meeting compared \$500 billion in purchases this year with \$1 trillion. None of the purchases go beyond the end of 2013 and through 2014 or beyond, if needed. But many market participants and Fed watchers now expect purchases to extend well into 2014, which means that we're getting the benefits of a larger stock of purchases but making decisions based on the costs of the smaller program.

If, last December, we had voted for a closed-end \$500 billion program, I would have had no trouble supporting it. If we had decided to add another \$250 billion, I could have gone along with that also. I get really queasy as we approach \$1 trillion dollars, but, depending on conditions, I might have been able to stomach even that level. As Governor Tarullo pointed out last time, the amount of risk that I'm willing to assume depends a lot on how dire the conditions are or the outlook is. But the risk I find hard to swallow under any conditions is the risk that we may have lost control of the size of the program or that I, at least, feel as though I've lost any opportunity to vote "yes" or "no" on the size of the program. I understand that what I view as a problem may appear to others as a big advantage. There may be some around the table who are delighted that this strategy seems to be working better than any closed-end program and has had results that are greater than could have been achieved with a closed-end program that would have received the same level of support. I just don't like a threshold strategy for asset purchases. The time to voice this objection probably was last September, when we first introduced the language,

but I just didn't catch it then. I take responsibility for that mistake. For the last couple of meetings, I've tried recording in the minutes my view that there were limits to purchases that might be reached before labor market conditions demonstrated what many might judge to be substantial improvements in the outlook for labor markets, as a clue to markets that this is not an unlimited commitment. But I've seen over the intermeeting period that markets are only confused by the minutes, especially when the discussion in the minutes doesn't match the discussion in public.

My preferred path is to begin tapering purchases at our June meeting and to end purchases in the range of \$750 billion to \$800 billion in assets purchased this year. But if we are going to taper, we need to set up the possibility in the statement for this meeting. I hope that language changes in the statement, the Chairman's press conference, and the minutes of this meeting communicate that possibility. In any case, I think it's wrong to continue to let markets think we will continue purchases into 2014 unless that's actually our intention. And if it is our intention, then, for me, costs already outweigh benefits. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. Governor Tarullo.

MR. TARULLO. Thank you, Mr. Chairman. I'm going to jettison the notes that I had prepared that go through questions 1 through 4 in order, in part because I have the advantage of coming toward the end here, having listened to most of you. I guess I sometimes have difficulty figuring out exactly what the purpose of some of our go-rounds is, and this is one of those occasions. Sometimes the go-round is, I think, designed to give the Chairman a sense of whether a particular initiative is worth pursuing or not. Sometimes the go-round is very focused on the monetary policy statement and thus quite concrete. This one was a little odd because we're talking about a program that's already in tow, and to a considerable extent, I heard people who

were strong supporters of the program when we started it giving a lot of reasons why it was actually a good thing, people who were pretty strongly opposed to it giving a lot of reasons why the costs are pretty high, and people who are ambivalent expressing a fair degree of ambivalence, which isn't altogether surprising.

The difficulty that I think we all share is the mirror of what Betsy was saying a minute ago. She was talking in terms of her own decisionmaking or feeling not to have had an occasion to make a decision at the margin. I think what has been missing—and I have nothing to offer on the point, and I want to be clear about that—is a framework that is more probabilistic or at least roughly quantified that allows us to make judgments at the margin. Proceeding with another few months—what difference does that make? Not proceeding with another few months—what difference does that make? Most of the costs and benefits that everybody has been talking about are either at a macro level or very specifically focused on where we are right at the moment. I don't think that's surprising. This is a big initiative that really doesn't have precedent except if you think of the '30s and the immediate post-World War II period, which had a very different set of economic conditions. But it still makes many of us—I guess, myself included—a little bit uneasy, precisely because we don't have precedents from which we can at least begin our analysis of effects at the margin. But I think we just need to live with that, and I guess, to the degree that future staff work is going to be trying to support our decisions, I believe it would be most useful if the staff can help us make those kinds of decisions. I will say that I haven't heard anything today that suggests big differences in costs, for sure, of a couple of hundred billion more in purchases one way or the other. It seems to me that a lot of the concerns are with the balance sheet when it gets to a certain level or with a trajectory which may not have an obvious

ending point and thus raises the prospect of a very large balance sheet—as Betsy suggested, and probably some yet to come will suggest.

I do have a couple of very specific things to say, for what they're worth. First, I agree with the many people who have said that, to some considerable extent, the financial stability considerations here are about all of what we're doing now—zero-interest-rate policies, forward communications, as well as LSAP purchases. I would also drop a footnote here without elaborating on it. I'm not as sanguine about supervision as a surrogate for taking action on financial stability, but I think that's actually a very complicated set of issues that we should probably just discuss at some other time. There is one thing, though, that I keep hearing both from a lot of market participants or people who work for market participants and—maybe more tellingly, since they're not talking their book—from at least several academic economists who are actually pretty favorably disposed to sustained low interest rates and the LSAP program generally: a very specific concern about market reactions when markets see a fairly clear signal that we're going to stop, much less reverse. Now, the thing about this is, this is going to be an issue whenever we do it. It does seem an issue that's principally about communication, in the sense of getting a wider distribution of expectations about when we might stop before the moment at which we communicate that we're going to stop. But I have been struck by the number of people who, in a more or less unsolicited fashion, say to me that they think that's actually a pretty significant issue. That was the context, by the way, in which the Fed watcher from the '90s communicated his recollection of that period.

The second thing I would say is about the remittances and all. I guess I agree with—well, I'm not sure how many people said what I'm about to say. I think it's really hard right now to know what the political consequences of this would be. Think about it. If the exhibit is

correct, we're some years away from that. We don't know what the economic environment would be. In a good economic environment, many sins are forgiven, hopefully—that's number one. We don't know who's going to be elected President in the fall of 2016, or the identities of the President and the Secretary of the Treasury or the Administration's attitude will matter. We don't know who's going to control the Congress in 2017. So I think it really is hard to make an assessment, which suggests that it shouldn't weigh too heavily on our sense of what the merits are.

On the other hand, I definitely agree that—Jeff and Richard were the first two who said it, and I think a number have said it since then—trying to do remittance smoothing has a pretty high probability in the near term of eliciting a pretty negative reaction. It would have to be understood as more akin to banks not paying dividends in order to husband their capital than to corporations trying to smooth their earnings to deceive their shareholders. And I have a feeling that the latter might jump to people's minds, particularly if it comes on the heels of the Fed talking about the fact of, "We may have negative remittances at some point in the future." So I think that's an option we probably want to steer away from.

That's really all. I'm not even sure that was constructive, but that's all of the constructive things I have to say. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. Governor Raskin.

MS. RASKIN. Thank you, Mr. Chairman. I found the cornucopia of staff memos on the efficacy and costs of asset purchases to be helpful in clarifying my own thinking about how to think about not simply the extent to which these various cost factors exist today, but also the extent to which we can take action at this time to minimize the probability of these costs ever being incurred. I believe that asset purchases have provided, and continue to provide,

meaningful support to the economy, even though the magnitude of their effects on growth and employment are not large. I also believe that there are costs associated with asset purchases, even though they may have not yet fully emerged. These costs, though, can change at any moment, and so they bear continued watching. In particular, I'd be more comfortable if, instead of simply monitoring and analyzing them, we put some effort into figuring out which of them could be in our power to control or mitigate, and move aggressively to mitigate them ex ante—to pick up the phrase that President Kocherlakota had in his back-and-forth with Nellie. So I will focus my remarks on my view of those costs in which our actions ex ante might make a difference, primarily picking up several of the sentiments that many of you have already expressed.

I'll start with the obvious mitigant, and that is, what might be done with our supervisory powers. This is common sense, but I want to make sure we don't overlook it. Given the potential risks of financial instability arising from a rise in rates, bank holding companies need to be able to measure the exposure to rate shocks with reasonable confidence and thus to determine the level of risk that they're willing to accept. Nellie Liang tells us that the staff has conducted a study to assess selected LISCC firms' interest rate risk-management processes. The staff has considered the quality of certain firms' interest rate risk-measurement systems—including the comprehensiveness in capturing positions, the integrity of model assumptions, and the rigor of the analytical methods employed—and this is all good. Our examiners are determining whether the systems at these firms are sufficiently robust and whether the firms have adequate internal verification procedures to model inputs, assumptions, and reports.

Of the firms that were looked at, the practices were found to be “fair.” I would expect a “fair” rating to be good enough, I suppose. I'm assuming that all of the LISCC firms were

reviewed and that the matters requiring immediate attention have been addressed by these bank holding companies. Nellie also tells us that certain firms would benefit from increasing their focus on interest rate risk measures tied to their valuations, rather than focusing mainly on income-based measures, as they do now. They'd also benefit from improved sensitivity analysis of their core deposit assumptions, as well as from a greater focus on the implications of interest rate changes for credit, liquidity, and operational risk. The reviews also considered how well information on interest rate risk was being conveyed to the boards of directors of these firms and their relevant committees that manage this form of risk. Here, too, federal supervisors have found areas for improvement.

To the extent that we believe that interest rate risk can be managed by firms—and, obviously, we do, since we issue guidance about it and we examine for it—one way to mitigate the costs to financial stability that come from at least the institutions we supervise is to make sure they are meeting our expectations for having policies, practices, and procedures that permit them to mitigate against the effects of a significant increase in rates. For those firms that are not examined by the Federal Reserve, we should undertake to understand whether interest rate risk is being managed satisfactorily through the regulatory or supervisory processes that exist at agencies that are not ours but that are represented on the Financial Stability Oversight Council. With a slight shift in the comments that President Kocherlakota made, I don't think that we have to conduct monetary policy as if all other actions and events from other agencies are simply exogenous. We have a complicated regulatory system of many agencies in this country, and part of the intent of the Financial Stability Oversight Council is to give the Chairman not just a mechanism for understanding risks to financial stability that might be developing in other sectors, but also opportunities for communication and coordination with other agencies. I should

say that this coordination mechanism was recently flexed, actually, in the letter delivered to the FSOC regarding stability of money market funds, which was signed by every Reserve Bank president.

Also in the realm of financial stability costs is this phenomenon of reaching for yield. My reaction to this term is that the case for being concerned about it is most persuasive when it's used with some analytical precision. And I can't help but notice that the term "reaching for yield" is sometimes being thrown around as if it's necessarily a bad thing, but shifting portfolios over time ought to be part of both good and bad responses to the circumstances of low interest rates. Anyone holding anything other than TIPS would be reaching for yield. So, when we use this term in our communications—and we do have the power to communicate clearly—we should make sure the term is used in a productive way analytically, to identify potential observations that signal an increased risk of contagion. We should then do the necessary matching of these potential observations with proposed regulatory tools so that the risk of contagion can be minimized. This means, obviously, that we need to figure out whether there are regulatory tools that will address the risk of contagion. Now, some people may believe that no such regulatory tools exist. I'm not sure whether we've done all we can in this realm of exploring such tools as a means of controlling emerging problems of financial stability. Again, if the problem lies outside our regulated institutions, it seems to me that it's incumbent on the Federal Reserve to urge its fellow regulators on the Financial Stability Oversight Council to explore the regulatory tools that their agencies could meaningfully deploy.

I'll next focus on the costs associated with the possibility of sending to the Treasury zero or low remittances. I think there is legitimate cause for concern that the Fed may incur capital losses on sales of securities during the exit period. Under the Committee's existing exit strategy,

we plan to sell agency MBS at a gradual pace over a period of three to five years. Given the current size of the portfolio and projections of additional purchases, these sales would be expected to normalize the size of the balance sheet over three to four years. Since longer-term yields will presumably rise significantly during exit, we could realize significant capital losses on sales that would lower our income and depress the level of remittances to the Treasury. So, despite the fact that, in all of the scenarios, cumulative Fed income over the entire period from 2013 to 2020 is positive and substantial, there are ways to reduce the odds of realized losses in particular years by changing the exit strategy. I don't see any problem with exploring changes in the exit strategy in order to reduce the odds of such realized losses. I should note, by way of parenthetical, that I'm not at all enamored with the smoothing processes described in the staff memo. I think the political costs associated with withholding income from the Treasury in order to build a surplus account could be significant, particularly at a time when the federal government is contending with serious fiscal challenges. But the staff memo mentions some other options that are worth exploring that could reduce the potential size and duration of a deferred asset. We may engage in such an exercise only to learn that we don't have to change the exit principles in order to achieve what we now may be seeking. For example, we currently have the ability, within the current frame of the exit principles, to slow sales of mortgage-backed securities, but doing so could place more operational pressure on our draining tools, which we may not want to overly stress, given the size of our balance sheet. All of this is to say not that we should change our exit principles but that, given the time that has elapsed since the development of the original exit strategy, there has been tremendous change in the size of the SOMA portfolio. Given such change, it strikes me that revisiting the sequencing and steps would be prudent in light of the perceived costs associated with remittances that we now want to

minimize. So, devoting some time to a re-exploration of the exit strategy strikes me as another way to minimize a cost.

Finally, I think that, from the perspective of the FOMC statement itself, the Committee has taken some important steps in terms of the partial build-out of a reaction function. The numerical thresholds, in particular, adopted by the Committee in December 2012 should help investors more readily update their policy rate expectations in response to economic news than was the case under the prior, date-based guidance. It may be that more specification of the Committee's post-threshold behavior could be a further mitigant of risks associated with a substantial increase in long-term interest rates. Thank you.

CHAIRMAN BERNANKE. Thank you. Governor Stein, you were spookily accurate about the time. Governor.

MR. STEIN. Thank you, Mr. Chairman. Yes, I'll take the hint. [Laughter] I will do what Dan did and jettison most of my remarks. I think Dan just said something very wise, which is, it's fun to do cost-benefit analysis, and I've entertained myself with this endlessly, but I think we're now in a situation where any simple, static cost-benefit analysis is really going to be only a small part of the equation in terms of the decisions we actually have before us over the next few meetings. So, if you ask me for a number, I'd say the efficacy number is 10 basis points on the unemployment rate. And if you ask me for a cost, I'd say the cost is \$50 billion—I did this thing about fiscal cost before. That may be right, or that may be spectacularly wrong, but I don't know what guidance it gives us. What do we do in March? What do we do in June? It might have been more relevant when we first embarked on this open-ended venture, and it might have been, at some point, an argument for not getting on the train in the first place. But at this point, the train is rolling down the tracks, it's rolling pretty fast, and this doesn't amount to an

argument for slamming on the brakes. I think we could all agree that that would be damaging. It might be an argument for starting to apply the brakes, but it doesn't really tell us much of what we need to know about managing the dynamics.

So, with that in mind, let me suggest two things that a number of other people have spoken about that I think might be helpful. First, I agree with the many of you who said it's a good idea—I think it's a very good idea—to take MBS sales off the table. That's just removing a known curve in the track. Especially, we've heard about the risks of agency MBS REITs dangling out there. Why would we want to take the chance of dumping a bunch of supply into an illiquid part of the market, possibly creating some risk of a fire sale? Even if our holding on to this mitigates this risk by only a small probability, there seems to be little cost in doing so. In fact, as the exit memo nicely explains, we can get the size of our balance sheet down just as fast or even faster by selling short-maturity Treasuries instead, which is much less likely to cause any disruption. So, to me, this feels like an easy call. In my own case, it's not motivated by managing the time path of remittances, which I think is more of an ocular issue. It's just good economics, just the prudent thing to do.

Second, the train is moving down the track. I don't want to slam on the brakes necessarily. I don't want to let it pick up speed, either, because that only makes your problem harder the next time around. And I don't want to assume that the train is just going to nicely roll to a stop because we hit a nice patch where it's a little bit uphill. Maybe that will happen, but I don't think it's responsible to count on it happening. So, to belabor the point and to belabor the analogy, speed here is the market's expectation for how long and at what pace we're going to continue buying assets, and all of the associated financial stability issues that go along with that expectation, whether it's complacency, risk-taking, leverage, or whatever. The point I wanted to

make is that, if we're running on flat ground in the sense that the news is neither spectacularly good nor spectacularly bad, it's just that we're on a plateau, as, I think, Dan said before. If we're not tapping the brakes, we're going to continue to pick up speed because, think about what happens if we roll into June on the back of a few just kind of modal payroll reports and we don't do anything. The market should reasonably infer, all else being equal, that we're all the more determined—we've truncated a piece of the distribution—so we should be thought of as all the more determined to continue onward. So we would be wrong, I think, in that scenario to say, "Oh, our life will be easier in September if we just wait." Waiting, with just average news, makes things harder, not easier. And then, come September, if you're worried about the ultimate size of the balance sheet and you do have a limit in mind, then you've boxed yourself even more into the position of praying for the slope to start going uphill.

One final point. I'm just going to agree with a number of people on the earnings management thing. I think that would be a very bad idea. A number of people have articulated a very principled point of view that, holding fixed the present value of remittances, the vagaries of the time path of remittances is an ocular and not a substantive issue—and I care about the fiscal stuff. I think the high road is exactly Narayana's proposal to bore people to death with it. If you start trying to smooth, it's just going to beg people to draw attention to it, and, in particular, people will say, "Well, I can't trust your earnings. Maybe I'd better look at your mark-to-market instead." We just don't want to go down that path. I think that's another pretty straightforward one. Thank you.

CHAIRMAN BERNANKE. Thank you. Governor Powell.

MR. POWELL. Thank you, Mr. Chairman. I, too, will be taking that jettisoning hint pretty seriously. I believe the prior rounds of asset purchases have supported economic activity

in a significant way. I suspect that the efficacy of purchases today is significantly less than it was at the time of the crisis. I think the reasons for that are out in the open. I'll just mention three. They've all been discussed. First, businesses, in the ordinary course of events, do let rates affect their investment decisions. That's not happening now. Businessmen don't think it's happening now. What's motivating businesses to invest is reduced uncertainty and increased demand, and as you see those headwinds dissipating, you see investment responding. Second, the lack of credit availability—that's been discussed. And, third, just the general thought that you're at the zero lower bound means that, for any given reduction in the long-term rate, you're going to have less of a response. A related point is that we've got the short end pinned down, and so it's a bit of a stretch to see how LSAPs at the margin are going to have much of an effect on non-mortgage-related consumer borrowing. It's an understatement to say that LSAP effects are uncertain, but if forced to be pinned down on this, I would pick the "Reduced interest sensitivity" column on page 7 of the efficacy memo, which is 12 basis points in unemployment reduction for \$500 billion in purchases. That's about 200,000 jobs, a little less—enough to move the recovery forward by about a month. So I'm not high on efficacy.

Moving on to the risks and costs, with inflation under control, I have the same two main concerns as others. The first is that our policies will push the markets too hard, and that the result will be an unexpectedly sharp increase in rates as normalization approaches and damage to the real economy. I see that risk as manageable for now but increasing materially with the size of the balance sheet. I also see it as principally a risk of market dynamics and not one that is easily captured by our model. The second major cost, again, is that of the realization of losses, low remittances, and depleted capital. And I want to say that I think this scenario captures my concern. It's in one of the many memos. We buy another \$500 billion, which gets us to

\$1 trillion starting on January 1, 2014. Rates are 100 basis points higher. The first part of that is a near certainty at this point, it seems to me, at least in the market's expectation. The second is quite plausible. That gives us five years of zero remittances, \$300 billion in losses, and we sprout a deferred asset of \$63 billion in 2019. I'm very uncomfortable with that for the political risk reasons that have been elaborated. Fortunately, there are ways to mitigate it at no cost to policy.

I'll keep moving here. Communication is the main tool by which, I think, we do manage financial stability, and, in that light, the lack of clarity around our stopping rule for asset purchases is itself a financial stability risk.

Let me get to amelioration, and I'll point to two things principally. I'll join others in saying that not selling MBS addresses financial stability. The mortgage-backed securities market is the ideal place to start an unexpected sharp snapback in rates, and the principal reason not to sell mortgage-backed securities, to me, is to reduce the financial stability risk. We would be selling to investors who do hedge. That will put further pressure on rates. It's a great idea, and again, I see very little in the way of costs on that. It also addresses the capital and remittances issue. For the same reasons, I would be in favor of selling the short-term Treasuries as well. I take these effects as very desirable, I see no large policy costs in them, and half of the market already expects it. So, again, I think this is a really good one. Finally, to reduce risk—obviously, I think we could and we will clarify our stopping rule for asset purchases to limit financial stability.

Getting to the appropriate path for asset purchases, I would begin to taper purchases at the June meeting if we get payroll employment somewhere in the range of what we've been seeing, with a view to steadily reducing them along a predictable path. The market now expects

that purchases will continue well into 2014. They're starting to see current forecasts that go into late 2014. I think the markets are doing the best they can with a mixed message, as Governor Duke indicated.

I have one final point, which is to ask, what is the plan if the economy does not cooperate? We are at \$4 trillion in expectation now. That is where the balance sheet stops in expectation now. If we have two bad employment reports, the markets are going to move that number way out. We're headed for \$5 trillion, as others have mentioned. And the idea that President Kocheerlakota said and Governor Duke echoed—that we're now a captive of the market—is somewhat chilling to me. I think we need to regain control of this, or we will be moving out on that if the economy doesn't cooperate. There's some material part of the probability distribution that is not covered by a plan, in my view. The way to get at it is to increase flexibility, starting now, around the plan for the existing prongs: the costs and the risks, and what constitutes a substantial improvement. I think both of those need to be communicated better to the public in a way that increases our flexibility to do something, because if the economy doesn't cooperate, I don't know what we do. The problem has been, and is, the open-endedness of the plan. And I would say, in closing, that the risks may be manageable at \$4 trillion, but at \$5 trillion, you're in a different league. There has to be convexity in this, and I just think it's time to get hold of this process now. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you very much. Thank you, everyone. As a reward for your patience, I will forgo my own remarks. I will say only three things. The first is, a lot of people made reference to revisiting the exit strategy. It's relevant not only because of the size of the balance sheet, but also because it interacts with many of the issues we discussed today. In particular, the idea of not selling MBS and, instead, selling short-term Treasuries has a lot of

appeal to me personally, but I think we should discuss that in a context of the review of the exit strategy. So I would propose that we do that at the next meeting.

Second, a lot of people raised the question of how we can gain better control of the process, how we can communicate. Our statement is the first step. My press conference is a second step. I'd like to talk about that some tomorrow as part of our monetary policy go-round as we think about how we can best clarify for the market what the Committee is really thinking. I think it's very important, and we'll, of course, do that tomorrow.

And the third thing I can do is tell you that we'll reconvene tomorrow morning at 9:00 a.m. here, and we have dinner upstairs on the terrace. If you make any changes to your SEP projections, be sure to submit them in half an hour. [Laughter] Thank you.

[Meeting recessed]

March 20 Session

CHAIRMAN BERNANKE. Good morning. The last item on our agenda is the monetary policy discussion. Why don't we start with Bill English.

MR. ENGLISH.⁶ Thank you, Mr. Chairman. I will be referring to the handout labeled "Material for FOMC Briefing on Monetary Policy Alternatives." The top-left panel of page 1 of the handout shows the results from the most recent Survey of Primary Dealers regarding the projected path of SOMA securities holdings. The median dealer projection (the solid green line) reaches about \$3.8 trillion at the end of this year, reflecting expectations for asset purchases to continue at the current monthly rate until late in the year. As has been the case since the October survey, the median dealer path for the balance sheet is very similar to that assumed in alternative A of the Tealbook (shown by the red dashed line).

As shown by the blue dots in the panel to the right, the dealers continue to have a wide range of expectations for the level of the unemployment rate that will be associated with the decision to stop purchases as well as the timing of that stop. Indeed, the unemployment rate forecasts for the quarter when purchases cease ranges from 8 percent down to 6¾ percent, with the timing ranging from late this year to early 2015.

As noted in the bottom-left panel, 19 of the 21 dealers expect the Committee to reduce the pace of purchases for a time before completing the program. Of these, about half expect tapering to begin in the second half of this year, with almost all of the rest expecting it to start in the first half of 2014. Most appear to anticipate that tapering will last about six months. In response to a new question regarding exit, the dealers were about evenly split between those who expect the Committee to sell assets during exit and those who do not expect sales or think them unlikely. Finally, although dealer uncertainty about the size of the balance sheet this year and next decreased somewhat in the most recent survey, it remained high.

The bottom-right panel summarizes information on the outlook for the balance sheet from your SEP submissions. Twelve of you judged that appropriate policy implied a larger amount of purchases than the staff's baseline assumption of \$500 billion this year. Four of you indicated that your balance sheet projections did not materially differ from the staff's assumption—I should note that that count reflects a resubmission we received yesterday. A few other participants likely saw a smaller volume of purchases as appropriate. About half of you described appropriate paths for the balance sheet that appeared to imply no tapering, while roughly one-third of you explicitly assumed that purchases would be tapered.

Page 2 depicts simulations based on the staff policy assumptions for each of the three Tealbook policy alternatives: alternative B, the black solid lines; alternative A,

⁶ The materials used by Mr. English are appended to this transcript (appendix 6).

the red dashed lines; and alternative C, the blue dotted lines. With the \$500 billion of purchases assumed under alternative B, and with the current thresholds in place, the unemployment rate (the middle panel) is projected to fall somewhat below 6½ percent by the end of 2015, with inflation (in the lower panel) continuing to run a little below your 2 percent longer-term objective through the latter part of the decade. Under alternative A, with greater accommodation from both the balance sheet and forward guidance, the unemployment rate falls more rapidly and dips below your estimates of its longer-run normal level for a time late in the decade, while inflation runs a little above 2 percent during that period. Under alternative C, the projected path of the unemployment rate is somewhat higher and that of the inflation rate is somewhat lower. For alternative C, the staff assumes that the Committee raises the federal funds rate above its effective lower bound well before the unemployment rate hits 6½ percent or projected inflation rises to 2½ percent, on the assumption that those preferring this alternative are likely to be concerned about prospective inflation or the potential costs of maintaining very low rates for too long.

Turning to the policy decision at this meeting, alternative B, on page 7, continues the current pace and composition of asset purchases, and maintains the threshold-based forward guidance adopted in December. You may see the outlook for the economy as little changed, on balance, from the time of the January meeting, with the unemployment rate still expected to remain for some time at levels well above your estimates of its longer-run normal rate, and with inflation anticipated to stay subdued. And, following yesterday's discussion, you may believe that additional asset purchases will help to support a stronger recovery and that the costs and risks of such purchases will remain manageable. Even those of you who are less certain about the efficacy of further asset purchases or are concerned that the costs and risks associated with them will increase as the balance sheet expands may see the benefits of a continuation of purchases as outweighing the costs, at least for now.

The first paragraph of alternative B has been updated to reflect the somewhat improved tone of the incoming data, noting in particular that "Labor market conditions have shown signs of improvement in recent months," but it also points to somewhat more restrictive fiscal policy. The second paragraph is unchanged from January except that it deletes the reference to the easing of strains in global financial markets. The third paragraph now starts with an explicit link between the Committee's decision to continue the current pace of asset purchases and its assessment of the likely efficacy and costs of additional purchases as well as its outlook for the labor market and inflation. The fourth paragraph incorporates a more positive version of the Committee's stopping rule for purchases. The paragraph's final sentence links the Committee's decision on the size, pace, and composition of asset purchases not only to its assessment of the likely efficacy and costs of purchases but also to its economic outlook, a change that investors might read as suggesting a greater likelihood that the Committee will reduce the pace of purchases over coming meetings if the economy continues to recover as expected. The fifth paragraph is unchanged.

Market participants appear to expect the Committee to continue asset purchases at the current rate and to make no changes to the numerical thresholds, consistent with alternative B. However, the changes in the statement language might come as a surprise to some investors and lead them to lower somewhat their expected path for the size of the Federal Reserve's balance sheet. Thus, interest rates might rise a little, stock prices could edge down, and the dollar appreciate. The timing and size of the market reaction could be affected by the shortening of the period between the release of the statement and the press briefing following this meeting.

The more accommodative path for policy under alternative A, page 5, may appeal to policymakers who believe that the baseline rates of economic expansion and improvement in the labor market remain unacceptably slow, calling for a larger balance sheet and a lower threshold for the unemployment rate in the forward guidance. These members may be concerned that persistent and substantial slack risks permanent damage to the labor market, with negative consequences for the economy's longer-run economic potential. They may also see significant downside risks to economic growth and inflation stemming from the ongoing fiscal and banking crisis in Europe, particularly in light of the recent events in Cyprus, as well as from unresolved U.S. fiscal issues.

The first paragraph of alternative A is somewhat less positive than its counterpart in alternative B. The second paragraph employs wording similar to that used in December when the Treasury purchases were announced: It indicates that the Committee believes that without further policy accommodation, the desired improvements in labor market conditions might not be forthcoming. It also cites global financial strains and unresolved fiscal issues as downside risks to the economy. The third paragraph announces an increase in the pace of asset purchases, but generally retains the wording from January. Unlike alternative B, the fourth paragraph here does not add progress toward the Committee's economic objectives explicitly as a factor determining the parameters of the purchase program. The fifth paragraph lowers the unemployment threshold in the forward guidance for the federal funds rate to 5½ percent.

An announcement like alternative A would be a significant surprise to financial markets. Longer-term real interest rates would likely fall as investors projected a lower expected path for the funds rate and a higher ultimate level of asset purchases. Equity prices and inflation compensation likely would rise, and the foreign exchange value of the dollar decline.

Alternative C, page 9, might appeal to policymakers who believe the economic recovery has gained traction, particularly in light of the recent pickup in employment growth. With overall financial conditions very supportive of growth, some participants may now see it as appropriate to reduce the pace of asset purchases and the total expected size of the purchase program. Some participants may view the current elevated level of unemployment as primarily the result of structural factors following the financial crisis and so want to bring the purchase program to a rapid close in order to reduce the odds of an undesirable rise in inflation. Nonetheless, they

may view an abrupt cessation of purchases as risking an outsized market reaction and so want to taper the pace of purchases. Alternatively, policymakers may have concluded after yesterday's discussion that the costs and risks of additional purchases likely exceed the benefits, or soon will, and so want to begin ramping down the pace of purchases at this meeting.

The first paragraph in alternative C offers a more upbeat characterization of economic developments, while the second paragraph indicates that the Committee expects economic growth to “pick up further over time” and describes the risks to economic growth and inflation as roughly balanced. The third paragraph states that, based on its outlook for economic conditions and its assessment of the efficacy and costs of additional purchases, the Committee decided to reduce the pace of purchases. The fourth paragraph then emphasizes that the Committee is prepared to adjust that pace up or down if the outlook for the labor market or inflation changes. The fifth paragraph leaves the forward guidance unchanged.

A statement like alternative C would come as a considerable surprise to market participants. Interest rates would likely increase sharply, and stock prices could decline significantly.

Draft directives for each of the alternatives are presented on pages 12 through 14 of your handout. Thank you, Mr. Chairman. That completes my prepared remarks.

CHAIRMAN BERNANKE. Thank you. Are there questions for Bill? President Evans.

MR. EVANS. Thank you, Mr. Chairman. Bill, I'm just puzzled about how to think this through, so if you could remind me. I think this is a collection of things that were mentioned in the Tealbook and before. I understand the Tealbook assumption of \$500 billion in purchases through the first half of the year. And the Tealbook has talked about markets being disappointed by that and having some reaction. I have a little more difficulty when we interpret alternative B so explicitly, and it is not just with the size of purchases because there could be tapering that leaves it at that size. But you've got the date here that is the end of the second quarter. Could you walk us through the tensions that you must have been thinking about there? And then, while you are at it and I've got your attention, the new language in paragraph 3—that is likely to come as a surprise to markets. Maybe it's that we are informing them that this is our current thinking

here. If you could size up your expected market reaction—I guess that was in the Tealbook as well.

MR. ENGLISH. That's right. At least a bit. Let me take those in order. In terms of the balance sheet assumptions that we write down for alternatives A, B, and C, at this meeting we certainly considered changing those alternatives. Time has passed since we originally wrote them down. However, we were pretty hesitant to make changes coming into a meeting where you were going to have a big discussion about efficacy and costs of purchases and provide us—I hoped, and, in fact, you did yesterday—with a fair amount of information about your views about where you saw the appropriate path of purchases going. And so we left those assumptions unchanged from the last round. There was clearly some tension there, but it seemed helpful to us to not front-run the Committee and wait to hear your discussion.

In terms of the wording change in alternative B, I think that first sentence of paragraph 3 is noticeable. It gives emphasis to the role of your assessment of the efficacy and costs of additional purchases more clearly. As I said in my remarks, and as we said in the Tealbook, we think that, taken together, alternative B—and there are several different changes to the wording here—would be read as reducing a little bit the expected amount of purchases, and therefore, as a move in a tightening direction in financial markets but not a really big one. It is always hard to judge. So Simon and I talk about these things, and we do the best we can to parse it out. We could easily get that wrong. But our assessment was that this would be taken as a little bit of a warning that things could wind down sooner than markets currently expect.

MR. POTTER. Because they know that we know that they are not expecting too many changes in the statement. So the fact that we are making some changes in the statement is a little bit of a hint, if you followed that.

MR. EVANS. Okay. All right. Could I just have David remind us what the assumption is about the market reaction when markets learn that their expectation was wrong in the Tealbook?

MR. WILCOX. We predicated the projection on the assumption that they are expecting \$1 trillion. That in itself is an assumption because, as was discussed yesterday, those expectations are pretty diffuse and a little hard to discern. So we ended up scoring that as if it was a negative \$500 billion and, therefore, worth about the much-discussed two-tenths on the unemployment rate by the end of 2015.

MR. EVANS. Okay. Thank you.

CHAIRMAN BERNANKE. President Kocherlakota.

MR. KOCHERLAKOTA. Thank you, Mr. Chairman. I had a quick question about the chart on the upper right on page 1. This is about the modal unemployment rate at the expected end of security purchases. I probably should know this, and I've just forgotten, but did the dealer survey touch on the dealers' outlook for the unemployment rate one-year ahead from the end of purchases? Because, actually, we have couched our guidance more in terms of the outlook.

MR. ENGLISH. That is collected. I actually haven't done this plot using the forecast further ahead.

MR. POTTER. There is no explicit question like this. We take their forecast, take each respondent, and try to match their unemployment rate forecast with their expected purchases. So there is not an explicit question.

MR. KOCHERLAKOTA. Is there some kind of modal number for the one-year-ahead unemployment rate outlook you could give me on that, when you did that matching exercise?

MR. POTTER. You're saying to take these guys and then look at how much their unemployment rate goes down from there.

MR. KOCHERLAKOTA. Yes.

MR. POTTER. Not off the top of our heads. We could look at that. They are probably forecasting a little bit quicker decline than the Tealbook. Let me just check. The Tealbook is what again?

MR. WILCOX. I'm sorry, I was fighting the last question still. What is this question?

MR. POTTER. I think President Kocherlakota's question is, let's look at the forecast after the end of purchases. How much of a decrease did the—

MR. KOCHERLAKOTA. If you look at the dealers, you ask them when they expect purchases to end. There will be some modal date, and then you can take that dealer and map that into what their unemployment outlook would be one year ahead. Roughly speaking, that's what I'm after.

MR. ENGLISH. I don't have that in front of me. What I do have is the modal unemployment rate forecast across all of the dealers for the end of each year.

MR. KOCHERLAKOTA. That's helpful.

MR. ENGLISH. And so going, say, from the end of 2014 to the end of 2015, it looks like that declines by about four-tenths, from a little under 7 to a little above 6½.

MR. KOCHERLAKOTA. And if you went from 2013 to the end of 2014, about the same?

MR. ENGLISH. It goes down from about 7½ to a little under 7.

MR. KOCHERLAKOTA. Okay. Thank you. That's very helpful.

CHAIRMAN BERNANKE. President Fisher.

MR. FISHER. I want to come back to President Evans's question, Mr. Chairman, if I may. By my count yesterday, 12 of the discussants mentioned the possibility of tapering in the second half. And the question is, in paragraph 3 there, is it your best judgment, Simon and Bill, that that language would at least signal that possibility? The operative phrase is "current assessment." But by putting that first sentence in there, do you think that at least provides a glimmer of a hint that it wouldn't surprise the markets? Is that correct?

MR. ENGLISH. We think it is. It is also the last sentence in paragraph 4, President Fisher, that notes that the Committee will begin to "take appropriate account of the likely efficacy and costs of such purchases as well as the extent of progress toward its economic objectives" in determining the size, pace, and composition of the purchases. But, yes, those two together I think would make that point.

MR. FISHER. Thank you for answering my question. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Other questions? [No response] Before we get started, I thought I would just say a couple of words about my press conference strategy in the hope that maybe I could get a little feedback as we go around the table.

Yesterday we had a good bit of discussion about policy options, and we had our usual friendly hawk–dove continuum. But there was a lot of commonality of people who (a) wanted to increase our optionality to some extent, in terms of our choices about the program going forward, and (b) were warning against the \$5 trillion scenario effect. Governor Powell called it that. So pushing back against that is very delicate, and, of course, we will all share responsibility for what happens. [Laughter] But let me tell you what I am planning to do. I have four pieces of tactics that I want to use.

First, consistent with the language about labor market conditions showing signs of improvement, I will note the improvements in the labor market and give some examples and say the Committee will be continuing to look for further improvement. So I will take note of the fact that the labor market has improved some—a little bit of optimism there.

Second, consistent with the beginning of paragraph 3 about the Committee's current assessment and so on, I will say that we discussed efficacy and costs at the meeting. I will be clear that at this juncture we think those costs are manageable and don't outweigh the benefits, but we are going to continue to monitor that, and that will continue to be on our radar screen.

Third, I'm going to restate something that I have said before, which is that we have a flow program, and the reason it's designed as a flow program is so that the flow can adjust to incoming economic information, so that we could adjust the flow as new information about the outlook for the labor market, et cetera, comes in, and that would be consistent with the language at the end of paragraph 4, which says size, pace, and composition will depend on the extent of progress toward economic objectives.

Finally, I will talk a little bit about the relationship between the asset purchases and the guidance, noting in particular that there's a considerable period between the two, that they have different purposes. I will make the logical point that a slowing of purchases is a slowing in the pace at which accommodation is added, as opposed to a tightening, and that the tightening process, whenever that comes in the future, will take place via the rate process—and I'll mention the projections that say 2015.

Those are some things I am going to try to do. We have worked carefully on the language, but if anyone has any qualms or suggestions, you can please fold those into your

policy discussions. With that, why don't we start the policy go-round, and I will start with President Kocherlakota.

MR. KOCHERLAKOTA. Thank you, Mr. Chairman. Today I am willing to support alternative B. I would like to spend most of my time thinking about the next two meetings to come.

I think that yesterday's discussion was very fruitful. It revealed a basic tension in our current policy stance, and I will summarize that tension as being between two forces—credibility and balance sheet size restrictions.

Let me talk about the credibility issue first. In September of 2012, we adopted what I termed yesterday as sort of a “whatever-it-takes lite” kind of approach. And we used a substantial improvement in the labor market outlook as a stopping rule for our asset purchase program. We did not define specifically what we meant by a substantial improvement in the labor market outlook. I think we didn't because we were hoping to preserve optionality. And what happened, unfortunately, is that the public did form a relatively concentrated definition of what substantial improvement in the labor market outlook meant. If there was a lot of diffuseness to that, I think we would have a little more flexibility than what we ended up with. There is a fair amount of concentration in belief, as is depicted in the dealer surveys. I'm going to try to summarize that agreement in my own way. I think there are other ways to do this. We will continue purchases until the one-year-ahead forecast for the unemployment rate is less than or equal to 7 percent. Why do I say that? That's basically going to the end of 2013 and looking ahead one year. And if you look at private-sector forecasts and our own forecasts, the unemployment rate is around 7 percent.

Now, this is all about interpretation of what we meant. I think if we don't live up to this, the costs could be quite significant. Everything we do at the zero lower bound—especially at the zero lower bound—hinges on credibility. And if we don't live up to the public's expectation of this, it really throws doubt on our current commitments, including our threshold of 6½ percent. We might grow tired of that, might grow scared of that, and stop early, just as we are potentially thinking about in terms of this program. And it certainly throws doubt on our ability to use future commitments to cushion the economy against shocks. This is very reminiscent of the problem the Bank of Japan faced where it would make commitments and then could be perceived to be reneging on those. It really challenged them to have tools to operate effectively at the zero lower bound. Here I believe I'm echoing words that the Vice Chairman and Governor Yellen spoke yesterday. So that is the credibility side, and it is a very important fact that we have to keep in mind as we think about what we're going to do moving forward.

I talk about this program being open-ended and “whatever it takes,” but there is a basic tension, a conceptual problem with using the balance sheet in that way. As Governor Powell emphasized, there was a cap for him, but I think if we went around the table, there would be a cap for everybody. The cap would differ, but there would be a cap for every person. And that is conceptually inconsistent with an open-ended program because there could be outcomes that will end up hitting that balance sheet size. I'm going to try to work my way through this tension, and I will admit right away that there is no way to solve this. There is no way to cut this Gordian knot. You are going to have to live with some compromise on both sides to a certain extent.

On the credibility side, my way of trying to slice a little bit off of that is to emphasize that I think our commitment is to accommodation and not to a particular tool. It's not clear this is right, but I think it's useful for us to argue this with the public because it gives us more flexibility

going forward in terms of the mix of tools we want to use. And from an economics point of view, that is what we really care about—the path of accommodation.

So my first starting point is that. And my second starting point is, we all have a cap. Whatever that cap is, we are less likely to hit it, and it will take longer for us to hit it if we are buying assets at a slower rate, if we taper. What I would propose that we could think about doing is to taper in June—and what the level is, I'm flexible about—but I would be willing to go down to \$50 billion or \$30 billion per month, with the idea that that allows us to use that flow of purchases for longer as needed. I think this ties in, Mr. Chairman, to what you were talking about that you were going to say in your press conference. I think it prefigures very nicely the idea that we can change the flow in response to incoming information.

The second step, though, which for me is very important, is that we can't just step back like this. We have to clearly be seen to be replacing this with other accommodation. I have suggested this in the past, I suspect it's not going to go anywhere, but I will emphasize it because it is in alternative A. The staff has done further research on the threshold strategy. We could lower the threshold for the unemployment rate that we have in our forward guidance. It provides stimulus in and of itself, but it also works with the asset purchases to make them more effective because they will know we're going to hold them for longer. That's one approach you could use.

Let me talk about ones that I think I heard more support for around the table yesterday. One is to say we are not going to be selling MBS on exit. That is stimulus right there, and that can be quantified and measured by the staff in their work to think about exactly how much stimulus that is providing. Another similar kind of thinking is that we could reword our exit strategy principles to really emphasize that our pace of withdrawal is going to be slower than the markets would typically expect. So it's going to be slower than what we used in 1994 or in

2001. Obviously, we have to be careful about how to word that. It is conditional on economic events, but we want to try to say that our reaction function is going to be easier than the markets would anticipate.

I think this ties into what you are planning to say at the press conference, Mr. Chairman. One more thing you could add to the mix of things you are planning to say is to talk about how we are planning to reword the exit strategy principles, and that rewording, that thinking, has a lot of impact on current stimulus. Something that comes from all of our models, all of our thinking, is that how we plan to exit has an impact on the amount of current stimulus.

So, again, tapering is step 1. It allows us to use purchases longer. But then we, at the same time, pivot to other forms of accommodation. The benefits of this are that we don't run into the cap for a longer time—it's not forever, but whatever your cap is, we don't run into it as soon. We don't give up credibility of accommodation. It allows us to diversify across a range of tools, as opposed to focusing so much on one. And I argue there are some benefits of that diversification, given the uncertainties we have among all of our tools.

Also, I think that trying to commit to a slower pace of withdrawal—using wording to indicate that that is our intention and our plan—and the stopping of MBS sales have benefits both on the remittance front and the financial stability front that we heard concerns about. It is not a perfect solution. I do not believe there is a perfect solution to this problem. We could still run into the cap, whatever your cap is.

And Governor Yellen stressed in her remarks that she felt there was credibility to a tool as opposed to credibility to accommodation. I think there is some truth to that. There is some truth that we made a promise about how we're going to use the specific tool, but, really, from an economics point of view, our credibility should be tied to accommodation. We should be getting

the public to think along those lines, as we did in December when we switched away from a date to a state-contingent forward guidance—I think there was no slippage there. We can try to negotiate that in the next couple of meetings as we think about that.

For steps forward, for the next meeting it would be very useful to have staff analysis about a mix of tools that we could be thinking about to keep the level of accommodation the same. So, tapering down to a path of purchases and then thinking about the exit strategy, lowering the threshold, or both. We should think about how we could reword the exit strategy and use it as another form of stimulus to substitute for our tapering. What we're looking for is a mix of policy tools that takes a longer time to hit any balance sheet cap and still delivers the current path of accommodation.

This is just to restate something that I'm sure is obvious at this point. I am all about trying to keep the level of accommodation the same. I just think it is really hard when you look at our outlooks to argue we should be tightening in a significant way in June. I'm not in favor of that. In fact, as I said at the last meeting, there is a strong argument for actually adding to accommodation. Certainly it's very challenging—when the outlook for inflation is as weak as it is, and where we have a target, we've said, of 2 percent inflation—it's very hard for us to be backing away from that in such a significant way at this stage. But I do think we have a lot of flexibility about composition, and we should use that to negotiate this tension that our conversation highlighted yesterday. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. President Lockhart.

MR. LOCKHART. Thank you, Mr. Chairman. I support alternative B. I think it's premature to contemplate anything along the lines of alternative C, and the signs of progress in the labor market are encouraging enough to hold fire on any acceleration of purchases, as in

alternative A. I do have a few minor comments on the statement, and I emphasize “minor.” I hesitate to complicate your negotiations at the end of the meeting, but let me go through these.

I’m basically okay with paragraph 1, but it’s worth pointing out that current estimates in anticipation of a final reading on fourth-quarter growth last year put the number closer to 1 percent than to zero. So I wonder if we want to characterize the fourth quarter as a “pause,” which, to me, connotes “flat.” While still below the trend of the recovery, it’s not as much of a pause as we initially thought. So the word “slowdown” might be more accurate.

In paragraph 2, I have another nitpick. The SEP forecasts mostly anticipate a faster pace of growth in 2014 and 2015. Although there is nothing incorrect about the phrase “economic growth will proceed at a moderate pace,” it strikes me that the phrase in alternative C, excluding the word “further”—that is, “with appropriate policy accommodation, economic growth will pick up over time”—is just more consistent with the SEP submissions. However, I understand that the language in the draft is the language used in January, and such a change could generate questions.

Regarding paragraph 4, I share the concern that I think was expressed by Governor Powell and some others yesterday, that it’s possible the Committee later in the year could face an awkward or ambiguous set of circumstances in which there is some desire to taper, but we really have not seen adequate substantial improvement. So I have a slight preference for what I take as the softer, more tentative expression that was in the original marked-up version that basically says the Committee “intends to” continue its purchases versus the more definitive “will continue.”

And second, I suggested at the previous meeting the removal of the words “as always” in the sentence referencing considerations of efficacy and costs. I thought, and I still think, that “as

always” makes efficacy and costs sound a little bit perfunctory, like an afterthought. So I’m happy that this is proposed in the draft for this meeting. In the same vein, for this meeting statement, I suggest eliminating the replacement words, “continue to.” This verbiage would read simply, “The Committee will take appropriate account of the likely efficacy and costs.” In the event that the Committee finds itself grappling with a tough tradeoff decision, as I mentioned earlier, between the matters of substantial improvement and efficacy and costs, I think it may serve us to nudge the language toward a more explicit balance between these two considerations. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. President Williams.

MR. WILLIAMS. Thank you, Mr. Chairman. Alternative B reminds me of a well-known parable. Long ago, an Indian raja led the blind men of his city to an elephant. Each blind man touched just one part of the animal. The man who touched the legs said an elephant is like a pillar. The man who touched the ear said an elephant is like a leather shield, and the man who touched the trunk said an elephant is like a snake. Alternative B is made up of as many distinct parts as an elephant. I fear that the public will struggle to interpret our overall message. Like the blind men in the parable, each person will latch onto a different part of the statement and think it alone conveys the essential meaning of the whole.

In its typical understated tone, Tealbook, Book B, points out on page 34, “The size and nature of the market reaction to the new language in alternative B is difficult to predict.” I sympathize with the public’s challenge in understanding the statement because I myself find paragraphs 3 and 4 confusing. I count three separate descriptions of the conditions determining the continuation of our asset purchases. The first highlights the outlook for labor markets and inflation but also mentions efficacy and costs. The second is the reference to substantial

improvement in the outlook for the labor market. And the third, in the final sentence of paragraph 4, brings back efficacy and costs but introduces a new criterion: the degree of progress relative to our economic objectives, presumably an oblique reference to the level of unemployment. So how can we possibly expect the public to correctly recognize the elephant? To avoid this problem, I suggest we go back to the January versions of paragraph 3 and use paragraph 4 from alternative A.

Based on what I heard yesterday, we are not trying to signal a major shift in policy now, so we should stick with the cardinal rule: Don't make changes unless you want to say something different. The new elements in these paragraphs seem likely to add noise and muddle our message. I note that paragraph 4 in alternative A does replace the "as always" with "continue to." So I think that avoids the appearance that the reference to efficacy and costs is merely boilerplate.

As we get closer to the point of tapering, we can modify the language as appropriate. As I said, Mr. Chairman, I agree with the description of what you plan to say at the press conference. I see the press conference, as in other public speeches, as a better opportunity to explain our policy approach than to try to capture it all in the FOMC statement.

More substantively, I also propose, going forward, that we move away from the term "efficacy" and actually use the term "benefits." It's much more natural. You compare benefits to costs, not efficacy to costs. For example, the New York Fed memo highlights that if the efficacy of LSAPs is lower, we might do even more of them. The fact is that the implications of efficacy for policy are not clear. It's just an input into the analysis of the benefits of LSAPs. So in the interest of transparency, and I think clarity, the statement should refer to what we mean, which is benefits and costs.

So other than my concerns about the changes in the statement language, I support the policy actions contained in alternative B. The economy is only slowly improving. Inflation is well below our target. We're missing on both sides of our mandate.

Of course, continuing LSAPs is a potential cost, but at this stage, these costs are clearly outweighed by the benefits. In my view, we'll need to continue our Treasury and MBS purchases at least well into the second half of the year. That said, I anticipate total purchases of around \$750 billion for the whole year, which, based on the conversation I heard yesterday, doesn't seem that out of alignment with many people.

Going to President Kocherlakota's comments about exit strategy, we talked about that yesterday. I made some comments about that. I completely agree that the exit strategy affects the amount of accommodation we have, and we should be thinking about it in that way and looking forward to further discussions around that. Thank you.

CHAIRMAN BERNANKE. Thank you. President Rosengren.

MR. ROSENGREN. Thank you, Mr. Chairman. I support alternative B. My preferred policy would be to continue the current pace of asset purchases through this year as long as we expect to miss on both elements of the mandate over the medium horizon. Financial stability does not appear to be at risk from our actions to date, and I see no significant empirical evidence that financial instability is greater now than it was in the fall of last year. Furthermore, the staff studies support the view that benefits exceed the costs at this time. Were we to decide to taper in the future, I would emphasize that actions taken starting last September had substantially reduced tail risk as well as improved the outlook sufficiently to begin a slow taper.

The 12-month change in the overall PCE chain index stands at 1.2 percent through January, 0.8 percentage point below our 2 percent target. The unemployment rate is 7.7 percent,

2½ percent above my estimate of full employment. Most forecasters, including the Tealbook, currently expect a very gradual return of both inflation and unemployment to their long-run desired levels given the policies we have already enacted.

To be sure, we have put in place considerable stimulus between our extended period at the zero lower bound and our sequence of large-scale asset purchases. But even given all that, the progress toward normalcy is frustratingly slow. Our actions for the foreseeable future should be as aggressive as they would be if we were missing our key goals in the other direction by as much. If inflation were 2.8 percent, the unemployment rate were below 3 percent, and the forecast envisioned a three-year-plus period to return to our mandate-consistent outcomes, I have no doubt many, myself included, would be advocating for more-aggressive action. We should be no less aggressive in pursuing policy that will increase the speed through which we achieve mandate-consistent outcomes when the unemployment rate is high and the inflation rate is low.

I do agree with President Kocherlakota's characterization that last September we did somewhat promise to do whatever it takes. I think that actually has helped us quite a bit, particularly through all of the fiscal problems that we experienced at the end of the year and through the sequester. One reason that we haven't had more buffeting from some of the fiscal shocks was because of the monetary policy promise that we did make.

Now, I think that people have been emphasizing the modal forecast for unemployment, but I really would emphasize in your press conference, if you want to prepare the market for possible tapering, that the tail risk really has significantly diminished from where we were last September. The economy is continuing to grow, despite much more fiscal austerity than many people anticipated. If you had told me last fall that we were going to have a sequester and the tax increase that we had, I would have expected a much weaker first half than what we've

actually seen. Europe has definitely continued to be weak, but despite the election results in Italy and the turmoil in Cyprus, peripheral Europe to date has actually weathered the storm surprisingly well, so that the yields on Spanish and Italian debt have been pretty well behaved, given the sequence of shocks that we've had.

If we're to reevaluate whether we still need a "do what it takes" strategy, I think if that was the discussion we were having at today's meeting, we probably wouldn't say right now that we'd do what it takes, because I believe a lot of that tail risk has diminished. Even though I think it is appropriate to continue with a more aggressive policy than it seems like many others are comfortable with, if we are going to prepare the markets for some tapering in or after June, then emphasizing the change in tail risk as well as the change in the labor market outcomes would make sense. Thank you.

CHAIRMAN BERNANKE. Thank you. President Fisher.

MR. FISHER. Thank you, Mr. Chairman. I wanted to make two comments and then make a suggestion about the policy alternatives before us. The first comment I neglected to mention yesterday. I said I would talk a little bit about financial conditions, and what I had meant to say was about the banking sector.

The 2012 banking data show it was a good year for banks. We're back above a 1 percent ROA. Noncurrent loans are continuing to fall nationwide. Lending was up 5 percent last year, but I was somewhat tickled—and I don't mean delighted—but my brain was tickled from the standpoint of reading about JPMorgan this morning. The proportion of banks that are 1- and 2-rated is now 70 percent. That's the highest since September of 2009. You know that we developed, and a lot of the banks use, the SABR rating system. The proportion of possible downgrades has declined to the lowest level nationwide since 2006. My point is that, in addition

to having improved economic activity and all the different points that were made yesterday, our banking sector is healthier, and the performance numbers are certainly a lot more robust, than they were before.

My second point—we talk so much about the Bank of Japan, and I hate to bore you, but I did chair the joint commission set up by Prime Minister Hashimoto and President Clinton on deregulation and competition. You cannot compare our two societies, and you cannot look to the Bank of Japan to solve the problems of bid rigging, corruption, the utility inefficiency, the retail law inefficiency, even the accounting and auditing standards that they still have not gotten straight. I think we have to be very, very careful when we throw out the Bank of Japan as a comparison—total cultural differences, a totally different gearing of the economy, and, by the way, a totally different influence and structure in the way they conduct policy. I do agree that there are lessons that we can learn from the Bank of Japan, but there are so many differences in the way our economies are structured that still remain. The amount of accommodation they've provided is not necessarily instructive, and the methodology with which they provided that accommodation is not driven by monetary policy alone. I wanted to make that point.

We mentioned the word “credibility” a great deal. It seems to me our credibility will be underscored best if we're not driven by any fixed date but instead by being practicable and by being able to show that we can adjust to developments in the economy. I think what you suggested with regard to your press conference—in particular, talking about the flow program, and that it would be adjusted, and making the point that slowing the pace of purchases is still additional monetary accommodation—is the right approach. This is what we used to call in chemistry at Harvard “volumetric titration,” an even more nerdy phrase than you would use, Governor. Those are the points I wanted to make.

With regard to the statement, President Lockhart’s suggestions are very sound, and I would highly recommend them in paragraph 4, particularly changing the word “will” to “intends.” It’s a slight difference. The Committee should consider it.

I did submit some language that suggests that I thought the first paragraph of alternative B was a little bit too Eeyore-ish, and I didn’t want to be Tigger-ish, to use the *Winnie the Pooh* example. I noticed you included them in alternative C, Bill, and I appreciate that. It seems to me if we took that language in alternative C and combined it with what you have in the remainder of the first paragraph in alternative B, I, at least, would be more comfortable. It would signal the right tone. It still doesn’t go overboard. You would have to add that fiscal policy is still restrictive or the wording that we have, but I think there’s a slight difference in tone in that first paragraph.

I don’t expect you to change things. I don’t have a vote, but I would suggest that we go to some length to at least provide that slight hint that Simon and Bill have tried to work out and combine it with your press conference, Mr. Chairman. But at least reflect the possibility that we will indeed in June, if economic conditions prevail, begin the process not of shutting off the program but of tapering it, or, as you put it, “slowing in the pace at which accommodation is added.” Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. President Evans.

MR. EVANS. Thank you, Mr. Chairman. I certainly support alternative B and support continuing our current pace of asset purchases. I will say, like President Williams, I’m not really a fan of paragraph 3 the way it’s structured. Adding the language, “based on its outlook for the labor market and inflation, and on its current assessment of the likely efficacy and costs of additional asset purchases”—I know that, on the merits, that’s true. We’ve talked about how

efficacy and costs are a basis for evaluating these programs, but it's really kind of "in your face," it seems to me.

It reminds me of a time when, many years ago, I let a doctor talk me into having an X-ray. I thought I didn't really need it, and he was going to inject something—I don't know if it was radioactive, but it was something that caused me concern. He said, "Oh, this is nothing. We'll go ahead and do that." He wanted to pay for his X-ray machine. This was in the '80s. Of course, before he did it, he took me into his office. He showed me a piece of paper, and he said, "Now, you have to understand, there is a risk that you may die because of this." And I'm thinking, "I didn't think I needed it anyway," but I did let him talk me into it. I just think it's unnecessary. [Laughter]

MR. TARULLO. Well, you didn't die, Charlie.

MR. EVANS. No, that's right. Everything can go very well, but I think the markets already understand the basis for how we're going to think about it. So I'm not sure this is the right time. I am a little worried about an outsized reaction to this type of change once everybody starts thinking about what this likely means for the size of our balance sheet given what they are currently thinking. I worry that it's a little bit like what the ECB tried to do in July 2008 where they wanted to nudge things up a little bit. I agree, we need more accommodation now. We don't need additional restrictiveness today.

Those are some of my concerns. This touches a little bit on some of your comments for the press. You mentioned that you're going to point out that all flow increases are accommodation, and I understand what you mean by that, but relative to expectations, once we move the size of the program down, that could have an adverse effect. I think that's consistent with the way I'm thinking about it. But I just suggest being careful about that.

Recognizing that language that shows up in alternative B usually stays in alternative B [laughter], there is one word that I really don't like, and it's "current"—"based on its outlook for the labor market and inflation, and on its 'current' assessment." I think, on the fundamentals, that's redundant. It's based on our assessment. Yes, it's current. What else would it be based on, tomorrow's assessment or yesterday's assessment? But I think that the force of this is going to be a little bit more like when you have a problem employee that you haven't dealt with for a while, and you're going to undertake a performance action with them, and the employee relations people ask you, "Now, how did this work out before? Has this been a good employee?" And you say, "No, they've always been not so good. I didn't really want to do this before." Then they say, "Well, but you said they were doing pretty well. So we need to start this off." And you always say, "Okay, currently you're doing okay, but in 30 days we're going to talk again," and then, "I don't think you're doing so well." I think that's sort of what this is trying to get across. I'd strike that word, myself.

The economic and inflation situations today call for continued strong accommodation. My SEP submission was based on appropriate monetary policy, which I have learned to interpret in the current situation to mean that we should be trying for overshooting on inflation and also on the economy. I had an additional boost on asset purchases and I could probably be convinced to go with less. So my somewhat outsized assumption of an additional \$750 billion may be too big. But I do feel strongly that if we're going to adjust the flow, like President Rosengren and others have been mentioning, it should be on the basis of reduced tail risks, an expectation that the labor market is really improving.

I strongly agree with your plan to emphasize the labor market improvement issues in your press conference. I would do as much of that as you feel comfortable with doing because, to the

extent that we do end up tapering sooner than I would like, that should be the basis for it. If we end up tapering based on something other than success on the economic side, the markets are going to wonder about that, and it's potentially going to reveal that we never were really comfortable with open-ended programs. We said quite a lot that this was open-ended. When we go back and say, "Well, we didn't really mean it," then people are going to start thinking about what that means for credibility more generally, and I really do worry—President Kocherlakota mentioned this—that at the zero lower bound, everything we have that is effective depends on our credibility about forward intention. I worry about that being degraded.

Having said that, President Kocherlakota chose this opportunity to introduce some very interesting proposals, and I thought every one of them was worthy of consideration. Focusing on the one-year-ahead unemployment rate or labor market improvement strikes me as something that is meaningful. We might not be that far from it, looking at the SEP numbers. They don't quite speak to that exactly, but they're pretty good.

The idea of trying to measure the cap, if that's what we're going to do, to scale this so that there's a very low probability of hitting that cap, but then also providing some other accommodation, I certainly agree with that as well. Other than that, I do agree with continuing the pace. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. President Plosser.

MR. PLOSSER. Thank you, Mr. Chairman. Were I not afraid of surprising the public, I would advocate beginning to taper purchases at this meeting. The meager benefits of the current pace of purchases and continuing those to year-end, as indicated in the Tealbook, seems hardly worth it to me, given the prospective risk that we might be taking. Now, of course, such a move would be a surprise, and, therefore, I can get comfortable with alternative B at this point. But I

believe tapering at the next meeting or in June is likely to be appropriate if the conditions warrant. The minutes of today's meeting will reflect our discussion and should serve as notification, or at least a heads-up, that asset purchases might well be slowing in the not-too-distant future.

Mr. Chairman, I agree with your comments about the labor market, and it's important for you to convey those at the press conference. I'm very supportive of that. I'm also very supportive of your talking about the point that reducing the pace of purchases is not reducing the level of accommodation, it is reducing the rate at which we are trying to increase accommodation. There is a lot of confusion about what constitutes the level of accommodation versus the rate of change in accommodation. Making that distinction in your press conference would be very helpful.

Part of the problem we have with our flow program is that we've set up expectations that confuse stock effects with flow effects again. And we talked about this when we initiated the flow program, about what the expectations might be of what the ultimate stock would be at the end, and we deliberately chose not to talk about that. And we seem to have people arguing that because we let the market establish those expectations, now we can't surprise them. That was endogenous to the decision we made in the flow program, and we created the problem for ourselves.

Interestingly enough, on the other side of that same argument, I also could support faster tapering. If you really believe in the stock effects and the term-premium effects, the pace of our exit from our balance sheet really doesn't matter. Once we establish the size that we are going to unwind it from, the effects are there, and it may not make any difference whether we taper it slow or fast. Now, of course, whether we taper slow or fast may matter for other things. It may

matter for our remittances. It may matter for market functioning or effectiveness. It may interact with the effectiveness of interest rate tools such as IOER and other things, and how we manage our balance sheet. So there are other reasons to worry about the pace at which we would exit, but the argument for term premium is that once we decide the total size, the pace really shouldn't matter on that side of the equation.

At the time we begin tapering our purchases, we should also announce a change in our reinvestment strategy, which would help us on the exit. We could take a minor step toward reducing the duration of the SOMA portfolio by reinvesting both MBS and Treasuries into shorter-term Treasuries. That would help. We would keep the portfolio large, but it would gradually begin changing the mix. This would also help us if we choose an exit strategy where we do not sell MBS. By gradually reinvesting into Treasuries, we are going to change the composition of the portfolio, and that may help us and give us more flexibility as we move forward. This could mitigate some of the costs.

Finally, I just want to make a note about communication. Communication is always a very important part of our policy, and it is going to become more important as we navigate the end of purchases and our exit strategy. And a lot of the conversation the past two days has focused on how we manage that communication. One element, though, I have become increasingly concerned about is that the broad communication surrounding asset purchases, with its focus, in many cases, on how our policies are increasing stock prices or housing prices and working to help the economy through so-called wealth effects, is going to make our communications even more difficult when we agree to end purchases. I'm concerned that through our discussion of asset prices, we are creating a condition that is helping to foster buoyancy in asset prices. But when the time comes to withdraw, we then run the risk of a sharp

correction in the markets, which could dash confidence and set back the recovery. By emphasizing the boost in asset prices, I believe we are implicitly sending a signal to the markets and the public that we are taking responsibility for asset prices. I do not think this is a healthy strategy, and it could create a dangerous dynamic for the conduct of monetary policy in the future. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. Governor Stein.

MR. KOCHERLAKOTA. Mr. Chairman, I had a two-hander.

CHAIRMAN BERNANKE. Oh, I'm sorry. President Kocherlakota.

MR. KOCHERLAKOTA. Yes, I'm sorry to intervene in this way, but I am not following the line of argument that President Plosser advanced. I was hoping he could clear it up. If we had a given stock of holdings of assets, say \$3½ trillion, if we sell that all off in one day, I think it has less accommodation associated with it than if we sold it off at a dollar a day for the next 3½ trillion days, whatever that is. [Laughter] If we end up holding that stock of assets for a longer period, then it will end up having a bigger downward effect on the term premium because we are holding that stock of assets for longer. That was my understanding of the term premium effect.

MR. PLOSSER. It depends on when you start it. Also, that's not the argument we gave when we went into this. That is changing the terms on which we entered into the LSAP purchases in the first place.

MR. KOCHERLAKOTA. So it's a communication point you were making. I didn't understand. Thank you.

CHAIRMAN BERNANKE. Governor Stein.

MR. STEIN. Thank you, Mr. Chairman. I support alternative B. I like the new language in paragraphs 3 and 4, and I also agree strongly with President Lockhart's suggested modifications.

I would have liked to have been in a position where we could begin modestly tapering the pace of our purchases at this meeting. We have begun to see some signs of improvement in the labor market, and, in light of this improvement, a gradual taper might have been a way to signal that we are balancing costs and benefits in an ongoing, somewhat more continuous way. This would have given us more flexibility—more headroom under the cap, to use President Kocherlakota's formulation. But it is clear that we are not in a good position to do so. Given market expectations where they are right now, it's clear that a change of that sort would come as a pretty sharp surprise.

Now, of course, we have helped to foster these expectations. I had thought that the December and January minutes had just begun to open the door a little bit to our adjusting both the pace of purchases and the timing of the wind-up and had managed to do so actually with minimal market disruption, which I thought was a constructive thing. But that door seems to have swung a little bit shut again. There seems to be a pretty tight market consensus now around the idea that we are going to be going full speed more or less through the end of this year. And, at least based on my own judgments of costs and efficacy, that view is really, really starting to push up against my notion of the cap and my comfort level for essentially any plausible realization of labor market conditions.

With that in mind, I would strongly favor beginning to taper at the June meeting. I agree, again, with Narayana on this, and, importantly, as he suggested, the absolute right way to do this is to pair the announcement of the tapering with a revision to our exit principles in which we take

MBS sales off the table. I think this kind of a pairing should help mitigate concerns about the market reacting too strongly, particularly in MBS space, which is probably where we should be if we are going to be concerned at all about market fragility issues, for the sorts of reasons we discussed yesterday. To say it a little bit more strongly, it would be a real missed opportunity if we rolled out a revision to our exit principles in June and missed the opportunity to pair the two because, exactly as you say, we want to do something that balances these things and, therefore, sends a softer signal about overall accommodation. I think that is the right thing to do.

We are going to have to force ourselves not to just agree with this in principle, but to think pretty precisely about what our state-contingent strategy is, and to ask, how does that state-contingent strategy then feed into how we think about what happens in September and beyond? Based on what I'm hearing, it feels like if things go really well between now and June—let's just make up a number and call it 200,000 average payroll—it might be easier to get a pretty broad agreement around the idea of tapering in June, and that would be, from my view, a good thing. I don't think we can satisfy ourselves with just hoping for that scenario. We have to work through the tree and ask, what happens in other states? And an important set of the probability space, as Governor Powell was alluding to yesterday, is to think of the middle scenario, let's call it, 140,000 to 160,000 in average payroll gains.

Mr. Chairman, how we think about that is going to very importantly color how you think about the press conference, and how you start establishing the premise. Dan had an interesting formulation yesterday. You could imagine thinking of 140,000 to 160,000 as kind of a plateau. We have risen up, and we are coasting along. It's not much of a disappointment. And as President Rosengren was saying, we have taken some of the tail risk off the table. So you could imagine trying to set a premise where that is okay on labor market progress. I guess an

alternative would be to elevate costs and efficacy considerations and raise the idea of a cap. But I think that's kind of a difficult scenario for us to think about.

Since I am asking that we think about this scenario, let me put my own cards on the table. Outside of what I would call a marked deterioration between now and June—in other words, set aside the lower one-third of the probability space—I think we should begin tapering in the upper two-thirds—again, 140,000 and above—and pairing it with this revision to our exit principles. I would have a hard time seeing a case for not doing something if we are in this upper two-thirds. I'm trying as hard as I can to work through the decision tree, and I'm asking myself the question, conditional on 150,000, if we don't taper in June, what's the probability we can taper in September? So think about it. If we don't taper at 150,000 in June, then we get to September with, if anything, hardened market expectations. They'd have to have moved out because in our middle scenario we didn't taper. And stuff is serially correlated, so if job gains had been running at 150,000 through June, it is less likely that they are going to start running at 250,000. Then you get to a situation where it becomes hard to taper in September. I'd say there's a 50 percent or greater likelihood that we find it hard to taper in September if we didn't taper in June unless, of course, we make a lurch at that point and, all of a sudden, elevate costs and efficacy in what will be a difficult state of the world. You have to think about it that way.

Again, with this cap ultimately in mind, we kind of just game it backwards. And that's why I'm leaning toward doing something. Also, if we don't do it in September, December is really hard. We may be looking at a transition, and one doesn't want to preempt whoever the new Chairman may be and all that kind of stuff. If you start thinking about the cap a little bit dynamically, it pushes you back. That is what gets me to having a pretty strong presumption for

June and, very importantly, paired with something that takes some of the sting out of it, in particular, the move to get rid of MBS sales. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. President Pianalto.

MS. PIANALTO. Thank you, Mr. Chairman. I support alternative B. My economic projections are consistent with a steady decline in the unemployment rate and the preservation of price stability, conditional on asset purchases being similar to the current Tealbook path.

With that outlook, it might seem more logical for me to support alternative C today. Moreover, I explained yesterday why I am concerned about the risks associated with further expansion in our balance sheet. My support for alternative B today is due primarily to the desire to be more certain about the economic outlook and to better prepare financial markets. As I indicated yesterday, I would judge the outlook for labor market conditions to have improved substantially once I see six to nine months of average job gains of about 200,000 per month. Since we have already had five months at that pace, I am almost there. But I would like to see another month or two of good labor market data. I would also like to taper the pace of purchases before stopping them altogether. Consequently, even though the language in alternative C most closely describes my thinking, I think such a statement would be premature and certainly not anticipated by financial markets. However, I think the language changes proposed in alternative B are a step in the right direction, if those changes are interpreted in the way that Bill and Simon expect them to be interpreted.

Beyond those changes, if economic and financial conditions evolve as I expect, I would favor adjusting the statement language further at our next meeting in a way that would prepare markets for tapering of asset purchases at our June meeting. Purchases could then be

discontinued as soon as practical after that—again, assuming that the economic outlook continues to support such a course of action. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. President George.

MS. GEORGE. Thank you, Mr. Chairman. My forecast assumes that the labor market continues to improve further over the course of this year. I expect fiscal policy will generate some headwinds, but private-sector demand and housing markets appear poised to support growth going forward.

Accommodative monetary policy can serve to encourage and support this projected pace of growth. Alternative B, however, continues a policy that I believe is too accommodative and poses growing risk to the achievement of our economic objectives in the long run. As I mentioned in the discussion on asset purchases yesterday, the pace and open-ended approach to our current program appear to provide small benefits while carrying a number of risks as currently calibrated. Given the improvements in the outlook for the labor market that we have seen from declines in initial claims for unemployment insurance and from the pace of private nonfarm payrolls, I believe we should start laying the groundwork for bringing asset purchases to an end.

I do remain concerned that the incentives to reach for yield continue. And although our dashboard may not signal near-term warnings, the time frame over which we have assured markets that rates will remain exceptionally low gives ample time for further acceleration. While I am confident that our staff will remain vigilant in looking for indicators of excessive risk and our supervisors will do the same, I continue to hear from community banks, insurance companies, pension funds, and individual savers who find the extended low rate environment extremely challenging and are actively looking for riskier alternatives. The staff memo on the

experience of Japanese financial institutions and retail investors offers a perspective but with a number of differences that make it difficult to compare. My own experience tells me that these risks can be hard to quantify and describe with any precision because they can arise in sectors of the financial system that are loosely monitored or poorly understood and are certainly beyond the scope of our supervisors to address.

I have raised these concerns not to suggest monetary policy should respond to specifically address such risk, but to ensure they remain at the forefront of our assessment of the efficacy of our policy stance in general, relative to achieving sustained economic growth. Monetary policy has its limits in achieving full employment on its own. And as our discussion yesterday highlighted, clarifying the framework for our open-ended purchase program will be important. I would prefer that we start now to taper asset purchases and tilt the mix toward Treasury securities in order to conclude the program by year-end. We could then slowly begin to normalize rates in order to minimize the buildup of financial imbalances, a mispricing of risk, and higher long-term inflation expectations.

Finally, as to the statement, I am not proposing any changes, but I do think President Williams raises some very good points about issues of clarity versus uncertainty in that statement. Thank you.

CHAIRMAN BERNANKE. Thank you. President Bullard.

MR. BULLARD. Thank you, Mr. Chairman. I support alternative B for today. I have just a few comments. I would say the general tenor of the data during the intermeeting period has been positive, and, despite the angst expressed around the table, I actually think the Committee is in a great position at the current juncture.

Continuing good news will put us in a fairly good position to adjust the pace of purchases at future meetings. I think a strategy of responding to incoming data by adjusting the pace of purchases will signal to markets the Committee's judgment concerning the pace of healing occurring in the economy. This will, in a sense, be good news and create a positive dynamic in the economy. I would very much take care to only taper in response to good news. We need to declare small victories when we get them, and they have been few and far between in the past few years. This will maintain the credibility of our approach and will create the right dynamic going forward.

Inflation is currently low according to our preferred measures, and on this I agree with President Rosengren. This certainly bears watching. We definitely need to defend our inflation target from the low side. In my own forecast, I see inflation over 2 percent in 2014, but I'm going to need to see some incoming data during 2013 and the first part of 2014 to get to that.

Let me talk for a minute about open-ended purchases. Let me say, categorically, this is an absolutely brilliant policy. [Laughter]

MR LACKER. The U.K. use of the word or the U.S. use of the word?

MR. BULLARD. The Committee is benefiting enormously, as many have mentioned here, from the automatic stabilizer or the automatic adjustment process that goes on by leaving this program open ended. When bad news comes in or the economy seems threatened by external events, markets immediately adjust without us lifting a finger. They adjust the length of time that they think we're going to continue purchases, and this provides a stabilizing influence on the economy from where it would otherwise be. Conversely, as the data come in stronger than expected, which we're certainly hoping will happen during the next couple of months, the private sector is forced to pare back its view of what monetary policy accommodation will look

like. So the open-ended nature has benefited us tremendously, and on this I agree with some of the comments that President Evans was making earlier.

Let me talk about the size of the balance sheet. President Kocherlakota said that everybody's got a cap. I don't think that's a good way to think about this. The size of the balance sheet relative to GDP is around 20 percent. I don't have the exact number in front of me, but it's around 20 percent. The Bank of England, the Bank of Japan, and the ECB are all around 30 percent. I think we have room to maneuver here. Whatever dangers lurk out there, these other central banks would have encountered them already, but I don't think having absolute caps is sensible. What we should do is just say that we do not wish to go further into uncharted territory if we do not have to, but we're balancing that, obviously, against the performance of the economy. But I wouldn't just say that there's some size of the balance sheet that is too big. I don't think that's a good way to think about it.

Let me come back to remittances. I was unconvinced by the talk around the table yesterday. Let me reiterate we are headed for a train wreck on this issue. We're talking about an exit strategy that pays large amounts of money, tens of billions of dollars, to large banks and to foreign banks at a time when we pay nothing to the U.S. Treasury. I think that is not a sustainable situation. We need to do more in the name of maintaining the reputation and credibility of the Federal Reserve to manage this situation. Other central banks around the world have handled this effectively, as we saw in one of those staff memos. I think smoothing remittances is absolutely the right way to go. I would not characterize this as managing earnings. I would say that what we're doing is provisioning for losses that you can see coming from a mile away. You should provision ahead and with the understanding that there's interest rate risk out there. If we could get this going in the right way, we could just take this issue completely off the

table. I think this issue, despite comments around the table, is impinging on people's thinking about policy, and it shouldn't. And so if we did the smoothing in the right way, we would take this issue off the table, and it wouldn't be part of the policy discussion.

Let me talk for just one minute about the fiscal implications of monetary policy. I disagree with attempts to characterize monetary policy as facilitating a better fiscal position for the U.S. government. My view is like this. We have a 2 percent inflation target. That produces seigniorage revenue, which in the steady state would be around \$20 billion in normal times. This is what the literature often refers to as the inflation tax. This is the only contribution of the central bank to the long-run fiscal situation in the United States. Monetary policy is neutral in the medium and long run. Stabilization policy mitigates fluctuations to keep the economy closer to the balanced growth path than it would otherwise be, but this has no implications for real revenue to the government over the business cycle because the highs are lower than they would otherwise be and the lows are higher than they would otherwise be. You're attenuating the business cycle. So I don't think that we should claim that there's anything that the central bank can do to improve the fiscal situation of the U.S. government.

Let me turn now to the issue of other accommodation. President Kocherlakota and others have said, well, maybe what we should do is taper purchases a little bit and replace with other types of accommodation. The other main tool that we have at our disposal is forward guidance, and we haven't talked a lot about forward guidance at this particular meeting. President Kocherlakota suggested perhaps doing more with this tool. For instance, you could promise a slower pace of increase in rates when the time comes to increase rates.

Let me reiterate my view on this. I think forward guidance is more suspect as a policy tool than QE. Forward guidance is a double-edged sword. Staying closer to the zero policy rate

for longer may boost the economy. That's possible, but it may also send a signal that the economy will continue to perform poorly for a long time. That expectation, that signal that we have been sending over the past couple of years has dogged us. This can lead, as I've talked about extensively here, to a bad equilibrium or a bad steady state in which rates just stay at zero and inflation declines to negative territory. I view the overuse of forward guidance as being possibly counterproductive for this Committee. Given the bad choice between forward guidance and quantitative easing, I prefer the asset purchase program to the forward guidance. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. President Bullard, the state-contingent forward guidance doesn't address your concern about the signal? Because we're saying we're going to keep rates low until—

MR. BULLARD. No, I do think that that has been helpful. That has been helpful and has helped to mitigate this problem, but I still think that if you try to make a lot of promises out into the distant future, you face some risk that you're saying that the economy is going to be bad into the future.

CHAIRMAN BERNANKE. Okay. President Lacker.

MR. LACKER. Thank you, Mr. Chairman. I fully support maintaining the federal funds rate target at 0 to 25 basis points. I wanted to say something positive. [Laughter]

I remain unconvinced about the value, efficacy, benefits, or whatever we call it, of asset purchases now, and I'd favor moving toward tapering as soon as possible. I think it would be feasible at this meeting, but I appreciate the comments about surprise and all.

I want to comment about one thing. We've talked a lot at this meeting, and it came up at the previous meeting, about the notion of holding MBS to maturity. One idea that I think I heard

in yesterday's discussion was that one value this would have is that it would take sales off the table, and that would help with regard to the risks posed by agency MBS REITs. To me, connecting our holding of MBS to the risks of agency MBS REITs is a terrible precedent and a dangerous notion. It suggests that market participants should look to buy whatever we buy and then box us into not being able to sell, because they can lever up and make themselves fragile and then box us into not selling. And I think that's kind of a moral hazard that we should treat exceptionally cautiously. If anything, that suggests we should sell sooner and get out of it more gradually before the risks in the agency MBS REITs get larger. More broadly, that dilemma is why I've argued against us holding things other than Treasuries. This is why I think historically we've wanted to stay out of markets because our decisions about disposition of those things—I know we all recognize this—have distributional implications that are tangential to monetary policy.

Now, there was a lot of discussion yesterday about the relationship between financial stability concerns and monetary policy. Market participants have all sorts of views, and they take positions based on all sorts of views, and some of those are levered. And so investors are investing in entities that are taking positions based on some views about how financial asset prices are going to evolve, and some of those outcomes are going to depend on decisions we make. For financial stability, you want resilience in the market, and you want to view those folks as likely to suffer the consequences of the decisions they make. You don't want them perceiving there to be some put involved. I think the farther we go in holding non-Treasury assets and the longer we hold them, the greater is the market's dependence on our having them in our portfolio and having them not be in private-sector portfolios. I think that it's going to make the adjustment to us backing out of those assets more costly for them. For me, this suggests we

should shift our portfolio away from MBS sooner rather than later. I'd even consider just swapping them out for Treasuries in a steady program over time.

So in this connection, I would note that our foray into housing finance began at the end of November 2008. The situation was really in the depths of the crisis, where considerations about the disruption and functioning of markets were very real. The functioning of the MBS market is not at all a concern in the same way now. If anything, we view it as functioning well now, and our purchases might impede functioning rather than aid functioning. It looks like our housing finance journey may last more than a decade. You know, if we hold these to maturity, it will be more than 10 years that we've been involved in holding MBS. Obviously, it has nothing to do with market disruption now. I think it has to do with aiding the housing market.

I'd also note in this connection a statement that we issued jointly with the Department of Treasury in the first half of 2009 in which both of us avowed that it was inappropriate for the Federal Reserve to steer credit to particular sectors. It just seems clear to me that housing per se is a particular sector as articulated in that document. And I've always had a hard time squaring our MBS purchases with that joint statement. Is that statement not operative anymore or what? I think we owe it to the American public, and we haven't done it at all, but we owe them an explanation squaring our MBS purchases with that document or else rip it up and tell people it's defunct. Those are my comments, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. Governor Yellen.

MS. YELLEN. Thank you, Mr. Chairman. I support alternative B and also the approach that you describe pertaining to your press conference remarks.

I think we should continue our asset purchases at an undiminished pace. We have thoroughly discussed their efficacy and costs, and as I indicated yesterday, I consider our

purchases to be efficacious. The evidence we have received since the program started in September is in line with my initial expectations.

On the costs side, as I indicated, I do see some costs, but I consider them manageable at this point. Moreover, I think we have learned nothing substantially new about costs since the program began. I hope we can revisit our exit strategy next time because I agree with Presidents Kocherlakota and Stein. I noted yesterday that I do see the potential to mitigate some of the costs that concern me by revising our strategy pertaining to asset sales. We will, of course, need to continue monitoring efficacy and costs going forward, and I remain open to revising the program should our assessment change.

With respect to the labor market, I consider it essential, as alt-B does, to reaffirm our commitment to continue asset purchases until we have seen a substantial improvement in the outlook for the labor market in the context of price stability. I completely agree with President Kocherlakota and President Evans that our credibility here is at stake, and it is just critical that we not degrade our credibility by failing to make good on a promise that we made in September. As I indicated in my economic remarks, I certainly do not see this criterion as yet being met, but there has been some improvement in the labor market. Labor market slack did diminish during the late summer, and payroll employment growth has picked up in recent months.

My forecast, like that of the Tealbook, envisions growth barely exceeding potential and little further improvement in the labor market over this coming year as increased fiscal drag offsets the improved momentum we're seeing in domestic demand. And my forecast for inflation one to two years out is still that it will continue running below our 2 percent objective.

But going forward I certainly am open to adjusting the pace of our asset purchases over time, depending on the progress that we do see in meeting our economic objectives. The dealer

survey suggests that the dealers expect us to vary the pace of our purchases as economic performance changes, and that's an approach I support, and, for that reason, I do support in paragraph 4 including the new language that makes that sentence explicit. In other words, we're really explicitly telling markets that we are prepared to vary the pace of our purchases as we see ourselves getting closer to being able to say that the outlook is substantially improved.

I very much hope that the performance of the labor market will exceed my expectations and that I will be able to say in the coming months that the outlook for economic growth and the labor market has strengthened. If that happens, I certainly see the potential for us to reduce the pace of our purchases even before we have concluded that a substantial improvement in the outlook for the labor market has been completely achieved.

CHAIRMAN BERNANKE. Thank you. I understand coffee is ready, and we've made good progress this morning. Why don't we take a 15-minute coffee break?

[Coffee break]

CHAIRMAN BERNANKE. Okay. Let's recommence, and I'll turn to Governor Duke, if you're ready.

MS. DUKE. Thank you, Mr. Chairman. Last December, I supported the flow-based LSAPs, based in part on staff analysis indicating that \$500 billion in purchases, an amount consistent with stopping in June, would be beneficial and assuming that the labor market forecast would be consistent with a substantial improvement in the outlook having been achieved by then.

Since then, labor market conditions have come in better than forecast. So I can support alternative B at this meeting in the expectation that we'll begin tapering purchases in June. And during the break, I was talking to President Williams out in the hallway, and we realized that his view and mine are not that different; if I expect to taper in June and he expects to taper in

August, there's not that much difference. So why am I so fixated on June? I think it's because we don't have very many alternatives coming up to make such an adjustment. Obviously, this is an action that we should take at a meeting that has a press conference where the action could be further explained. This meeting seems too soon. The September meeting could come on the heels of a nasty debt-limit standoff, as Governor Powell pointed out yesterday, or an extension of just-sort-of-okay results, as Governor Stein pointed out this morning, and December would be too late.

So how do we get there in a way that doesn't impair confidence or our credibility? First of all, I think the graph in the Tealbook of the projected path of unemployment that we had when we first made the decision to start purchases last September, compared with the current projection, does show substantial improvement. Sure, some of the improvement is due to revisions in the data we had at the time, but job creation held up remarkably well as we approached the fiscal cliff and, more recently, in the face of increases in payroll and income taxes. If job creation follows the path in the Tealbook, creating 500,000 jobs in the next three months in spite of sequestration, I think that would justify a step-down.

Mr. Chairman, I'm pleased that you plan to explain in your press conference that a step-down is still adding accommodation in a flow-based world, because it's only the potential for a step-down to cause markets to revise expectations for the ultimate size of the program that reduces accommodation in a stock-based view. But as I've said repeatedly, I think market expectations got ahead of where we should have anchored them. I think tapering with this communication would send the most confidence-enhancing message of any of the tapering communications that I can envision. But if we don't get this opportunity, I think the MBS market might provide us with another face-saving opportunity. By June, we could begin to see

fluctuations in mortgage origination volume that would cause us to reduce our MBS purchases, and, if so, I don't think we should add to Treasuries but just use that as an opportunity to step down just a bit.

In addition, I agree with a number of you that we should review our exit principles with a possible eye toward pairing a step-down in purchases with a commitment to hold the securities longer. When we originally designed these exit principles, we thought we already knew the final size and composition of our balance sheet. Now that we know it will be bigger and contain more MBS, it's appropriate to reconsider our sales strategy, which I'm fully willing to do but with three cautions.

First, if we're going to modify our MBS sales strategy, I think it should be used in conjunction with a step-down in purchases because, as such, it could be used to cushion the blow of lower purchase expectations by offering the additional accommodation of holding them longer. However, if we announce that we intended to hold them and we didn't reduce purchases, then that would add still more accommodation and cause markets to extend their expectations even further. Second, I can envision saying that we no longer plan to sell MBS over the three to five years after the first rate increase, but it might be difficult to fully design a new exit strategy precisely because we don't know yet what these purchases will ultimately look like in total. And the third caution, which may work against the first, is that in the past, every time we started talking about exit, markets took it as a sign of the end of accommodation, and this could get markets focused even further on normalization and cause them to change their position. Market participants seem pretty certain that purchases will continue at the current pace until at least the end of this year. Market expectations are determined, of course, by what we tell them. I don't

want us to deliver a substantial shock to the markets. The best way to avoid that risk is by keeping markets as fully informed as possible about the Committee's preferences.

If the Committee does, indeed, view tapering in June as a real possibility, the FOMC statement, the Chairman's press conference, and the minutes will all offer opportunities to guide markets. For my part, if labor market conditions continue to improve as they have recently and as we forecast, I would expect tapering to begin in June. Of course, if the conditions improve more quickly or more slowly than we expect, I would support adjusting purchases accordingly. I know I presented this view in the go-round yesterday, but I wanted to be sure that the minutes reflect this position as one expressed by a member.

Turning to the specifics in the statement, I actually agree with President Williams and President Evans that the changes in paragraph 3 create a lot of redundant discussion of the labor market, inflation, and costs and efficacy, and so I would get rid of the changes both at the beginning and the end. I am fine with "decided to," but put back the strike-out that begins "to support a stronger economic recovery." I don't think those two changes add a whole lot, based on our discussion, and if we take those out, it will emphasize the last line added in paragraph 4, which for me is the money line, which says "as well as the extent of progress toward its economic objectives." So I would make those two changes.

Consistent with that idea of drawing focus to the changes in paragraph 1, which are expected, and in paragraph 4, which will get more attention, I would not do the "pick up over time" suggestion in paragraph 2 that President Lockhart offered, although I wouldn't object to it otherwise. And then President Lockhart's suggestion that we do "slowdown" rather than "a pause" in paragraph 1—I really still think it was a pause, and I like that characterization. Other than that, I would agree with President Lockhart's suggestions.

And then President Williams suggested substituting “benefits” for “efficacy,” and I am so glad to hear someone as learned as Dr. Williams suggest “benefits” rather than “efficacy,” because I think “benefits” is a much more accessible and understandable term, so I would prefer “benefits.” Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. Governor Tarullo.

MR. TARULLO. Thank you, Mr. Chairman. I think once again Narayana put his finger on the issue that we face with this statement but, more importantly, maybe, with the next several meetings. He characterized the tension between the cap and credibility. I’m going to put a slight gloss on what he said because I think that there was a sense among many, though not all members of the Committee, that the reception of the September and December actions was not quite what they thought they were signing up for in agreeing to those actions. Thus, they were in a situation in which I think a critical mass, although, again, not all of the Committee, wants to reshape some of the external expectations even while trying to maintain the very important value of credibility.

To achieve that, I think what we should collectively be aiming for here in this statement and in the Chairman’s press conference is what he referred to in his opening remarks this morning as providing some optionality. Now, optionality does not mean a change in policy, although it will mean some change in perceptions. If you think about it, if you hold a position and you get no options, that’s your position. If you hold a position and you have an option, you may sell. So it will, in some sense, dial down expectations a little bit at the margin. But I think—and here I’m not speaking personal policy preferences but just trying to put together everybody on the Committee—there’s probably a majority, though certainly not everybody, who would feel more comfortable if the external expectations were not \$500 billion but maybe closer

to the \$750 billion or \$800 billion that Bill talked about at the last meeting, and not everybody likes that. Well, how do you get there? I think you do have to create a little bit of optionality so that you retain the ability in the next couple of press conference meetings if you want to dial down, to taper some. But, at the same time, if the majority of the Committee decides not to do that, you would not have already moved so as to undermine that credibility.

I think in a way, John, ironically this is a moment in which a little bit of uncertainty in those who read the statement and hear the Chairman's press conference is actually sort of a good thing. On the one hand, I, personally, would not want to say anything strong enough to send a signal that has everybody speculating after this meeting, "they may be tapering, they may be tapering." On the other hand, if optionality is the aim, then you've got to do a little bit to, again, emphasize improvement in the labor market and suggest that we're going through a decision process, at least during press conference meetings. So how does the statement feed into that? Well, I think there have been a couple of changes, and as Betsy says, probably the most important is the last clause in paragraph 4.

With respect to the proposals a couple of people made to go back to the language of the earlier statements, again, personally, I don't have a particularly strong view on it one way or another. Over the coffee break, as I was listening to people, I got a sense that some of those who feel like expectations got out ahead of where they and the Committee are were of the view that the introductory language in the beginning of paragraph 3 gave a little bit more prominence to the efficacy and costs issue than they felt had been heard by the public before. By the way, is the decision to have no doughnuts an effort to get people to act more quickly within the meeting so they can get to lunch? If so, it was a brilliant tactical decision. [Laughter] Again, I'm not expressing my own preference, but if one option is to go back to paragraph 3 of the earlier

statement, another option might be, in accordance with Charlie Evans's suggestion, to eliminate the single word "current," which at least pulls it back a little bit. Then, as Dennis and I think some others referred to, balance that by also eliminating "continue to" in paragraph 4.

Those are very minor changes that probably don't go to the center of what John is concerned about, but I would end by saying part of our aim now should be to try to come together with a working consensus on what we're saying and the kind of optionality that we're trying to create for ourselves. We do all have different views, obviously, but it's important that no matter which of our views prevails, that the Committee as a whole does maintain its credibility. Part of that at this point means preserving some optionality, else we risk a situation in which some months from now, there's a real split that gets emphasized to the world, which I actually think would be decidedly suboptimal. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. Governor Raskin.

MS. RASKIN. Thank you, Mr. Chairman. As I described in the economic outlook go-round, the economy is showing some signs of improvement, and with accommodative monetary policies that we have put forth, I expect growth to proceed at a moderate pace. I have yet to see convincing evidence that we've moved into a self-sustaining recovery or that the outlook for the labor market has substantially improved. Therefore, with inflation remaining low and steady, and the outlook for inflation remaining anchored at this juncture, I support the continued accommodation described in alternative B.

The benefits of our accommodative policy have clearly had a positive impact on financial conditions. Since September, interest rates and exchange rates are down, and equity and house prices are up. These improved conditions are starting to show through to the real economy. While difficult to measure in real time, the rebound in housing markets and business investment

is likely responding, at least in part, to the lower interest rates and the improved outlook that accompanied the mix of policies we initiated in the late summer. At the same time, many of the costs associated with these policies currently appear manageable, and I hope we rise to the challenge of thinking about ways to address them. Therefore, for purposes of this meeting, staying on the current policy trajectory appears to me to be the best course of action.

The internal discussion today about exiting and tapering has been very useful in contemplating our asset purchases. In addition to the fact that we're still far from both our inflation and our unemployment targets, we have to stay mindful of the cost of prolonging economic weakness, which could potentially be quite damaging to the economy. Although we have yet to see it emerge, persistently weak labor markets could lead to permanently bad outcomes. We also want to be mindful of the costs associated with a premature tapering and the tools we will substitute or lean more heavily on once we initiate that tapering.

In terms of discussing costs at the press conference and in the minutes, I'd underscore that the consideration of costs is not a one-day exercise but a continuous one. I wouldn't think it helpful for markets and the public to walk away with the view that there was any particular event or newly emerging concern that prompted such a careful and extensive discussion of costs by the Committee at these meetings. In fact, that is not why we considered costs so extensively, and I'd take some care to not leave that impression.

Regarding the moving text here in alternative B, one unsung virtue of the wording—the part of the elephant that I see—is the more positive spin on our stopping rule for asset purchases. Instead of saying, “if the outlook for the labor market does not improve substantially” in paragraph 4, this alternative now says “until the outlook for the labor market has improved substantially.” It's a subtle change, but one that is more in keeping with my view that purchases

are not a punishment by policymakers for poor outcomes [laughter], but rather are a source of meaningful support. We are communicating with the signal that we will not stand back and let the economy falter, but that we fully expect it to recover. But offsetting this slightly more positive signal, I do think that the new language in paragraphs 3 and 4 together could send a new signal, as Presidents Evans and Williams and others have noted. I think it's going to create some initial puzzlement but one that ultimately will be interpreted to reflect a sentiment toward a reduced flow, which is a signal toward tightening.

Without mentioning that we are taking MBS sales off the table or taking a different compensating accommodation, neither of which we're prepared to do today, the signal toward tightening is even stronger. This signal itself could be problematic if economic conditions do not improve. We don't want to be poised to taper only to learn that the economy can't yet support it. Tapering should be done only in response to economic conditions; it should not be automatic. I'll let the Chairman review for us the current options on the table in terms of how we piece together the right signal, but I do want to make sure that the statement does not reflect anything automatic. Thank you.

CHAIRMAN BERNANKE. Thank you. Governor Powell.

MR. POWELL. Thank you, Mr. Chairman. I will support alternative B at this meeting. If the employment numbers through May are close to the range in the past five months, we ought to take the opportunity to modestly reduce the pace of purchases, and I believe that the time to move to alternative C will be in June or, at the latest, September.

I also believe it is time to revisit the exit strategy that was agreed to at the June 2011 FOMC meeting and support a change in that policy to let the MBS portfolio run off. I also support selling short-term Treasuries after liftoff as described in the exit memo. These changes

would reduce financial stability risk, shorten the time to normalization, and reduce the risk of low remittances and accounting capital, all at what I see as very limited or no cost to policy. And I think it's important that those changes be announced at the same time the Committee announces an initial tapering of purchases. As others have noted, changes to the exit strategy have a feel of adding accommodation and the tapering sends the opposite message. Together they send a balanced message that leans to a reasonable extent, one would hope, in the direction of slowing the increase in accommodation. I think it would be a mistake to announce the exit strategy separately. To do so would add more accommodation and make it even harder to begin to taper without surprising the market. And I think we would be throwing away a very practical solution to a difficult problem.

Second, I think that our stopping rule for asset purchases needs clarification in the direction of adding flexibility on both aspects of the rule. First, the market's assessment of the substantial improvement test is hardening quickly. The sense of that is that nothing will stop our purchases other than satisfying that test. And as far as the nature of the test is concerned, it is, of course, true that the Committee will consider a number of employment-type measures, and output measures as well. It would be a mistake to work that into a multipronged test, each prong of which must be satisfied for us to taper purchases. I would begin to talk about that publicly in a way that preserves as much flexibility as possible, starting at this press conference.

In terms of my own sense of the test, it is beyond argument that labor market conditions have improved since September. The unemployment rate has come down about ½ percentage point more than expectation. Payroll employment is stronger, averaging 200,000 for the past five months. The six-month trailing number through about September was closer to 130,000 or 135,000. Other aspects of the market are stronger, including hours worked and the level of

employment. And, as I said, if we get payroll numbers in that range for the June meeting, I can see no reason why we would not taper other than the failure to prepare the market for that.

Second, the current cost–benefit test has turned out to be ineffective. In the context of an open-ended purchase program, it effectively says that we see no practical limit to the size of the balance sheet in the absence of market turmoil. By the time we see market conditions as an actual threat to financial stability, it will be too late. And let me say that I don't think it will ever be appropriate for us to say that the tools have stopped working. I just don't think that's something that we would do or should do. And, again, I would handle this aspect of the test in a way that restores some flexibility.

I remain concerned, as I mentioned yesterday, that if the economy doesn't cooperate, then we are on a road to a much bigger balance sheet, given the open-ended nature of the program and the market's understanding of our stopping rule. I found President Kocherlakota's framework to be enormously constructive and potentially very useful in addressing my concerns. First, at the beginning, thinking about this as a two- or three-meeting process is very helpful. Again, my concern is with the open-ended nature of the purchases and the lack of a plan in the event that the economy does not cooperate. So I really like the idea of working on other margins, different tools, a range of tools, and variations in the timing and pace and form of withdrawal. I like those a lot.

As far as the press conference is concerned, I do think it is important to begin to adjust market expectations. I realize that is a delicate thing, and my level of risk aversion is such that, faced with very much the same situation that President Evans was faced with at his doctor, about 15 years ago I walked into the doctor's office wearing my surgical gown and was handed a piece of paper. The doctor read it to me and asked me to sign that I understood that I might die at what

I felt was a very elective thing. I handed it back to him unsigned, handed him my gown, walked out, and went back to work. [Laughter]

MR. TARULLO. And you are alive.

MR. POWELL. That's why I'm here today. I would say, Mr. Chairman, you mentioned four dimensions you were going to work on in your press conference, and I have a couple of thoughts to add to that.

First, I thought that the idea of broadening the range of tools as an independent aspect to the level of accommodation was a very constructive one, and I wonder whether we couldn't work that in. I realize it's late in the day to be suggesting that. But for today's press conference, the idea that you can preserve accommodation through a range of tools, and we may vary the use of particular tools in doing so, would be very, very helpful in setting up the trade in June or September that we may reduce the pace of purchases, but we will cover that move in a way by changing the exit strategy—varying the pace of purchases, varying the form of the exit, that sort of thing.

And the second thing, which may be less useful than that but still potentially useful, is the idea of stressing the word “outlook.” If you read market assessments of this, the way this test works, and if you read a journalist's assessment, they don't talk about outlook. They talk about improvement in the labor market. That is a freebie in a way, just to stress that. I offer those thoughts for your consideration. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Thank you. Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you, Mr. Chairman. I support alternative B at this meeting. To me, the current set of policies seems to be working. As I mentioned yesterday, I conclude that the efficacy of the LSAP program is at least as high as I expected in September,

and the costs are no higher than I expected at that time. We are getting significant positive benefit in terms of financial conditions, and the improvement in financial conditions does seem to be lending support to the economy. And I think that support is needed now, given the sharp tightening of fiscal policy. In terms of going forward, I do hope the economy and labor markets will cooperate and allow us to turn down the pace of asset purchases at the June meeting. But we shouldn't prejudge that outcome now. It should be dependent on our assessment of benefits and costs and the degree of progress we are making toward our objectives.

Hope is not a strategy, as my predecessor liked to say a lot. So I do agree with Governors Stein and Powell and others that we do need to do some contingency planning. What happens if we don't see the improvement that we are hoping to see in the labor market? What are we going to do then? What are we going to pivot to? Because I think that will also help us think through the consequences of that pivot should we decide to take it. Is it really something that we are actually comfortable with or not?

As all of you know, I do support early review of our exit strategy, and I think there is a very strong case for not selling agency MBS. It would provide more stimulus. It would reduce the risk of a sharp rise in long-term rates and problems with market functioning. But I also do agree with President Lacker that mortgage REITs are the last reason why we should keep agency MBS on our balance sheet because there really is a moral hazard problem if we are not going to do something because there is some bad business model structure out there that somehow is going to intimidate us. I want the record to show very clearly that nothing we do on agency MBS has anything to do with agency mortgage REITs.

In terms of the language, my view is to always do the least changes to the statement that achieve your objectives because when you are introducing changes in the statement that don't

really go toward achieving your objectives, all you're doing is introducing noise and confusion and risk that the market will take it wrong. So on paragraph 3, I actually am partial to President Williams's observation that we are making paragraph 3 a lot more complicated without actually providing any clarity. I would be perfectly content to go back to the original formulation, with virtually no changes in paragraph 3. That would be striking the first sentence in red, going back to the original sentence, and then striking the last sentence because the last sentence just repeats the first sentence. In terms of the "will continue to" versus "intends to" language, I favor keeping the "will" rather than shifting to the "intends to" because otherwise people are going to say, "Why did they shift from 'will' to 'intends to'?" And what does that mean, the difference between "will" and "intends to?" It's a very subtle shift, but I think you are just introducing a lot of noise.

I think the money line in paragraph 4 is the last line, "as well as the extent of progress toward its economic objectives." That's the line that is actually the hook and that's the thing that needs to stay in if we want to change expectations. I don't understand why we would want to get rid of the "continue to" because it seems if you get rid of the "continue to," you are saying that we weren't doing this before, but now we are doing it. And that's not right. We have been doing this for a while. People knew that at this meeting we were going to consider efficacy and costs. So getting rid of the "continue to" confuses me because it implies that all of a sudden we're doing something that we weren't doing before.

In terms of the press conference, I am generally supportive of what you propose, Mr. Chairman. The one exception is that I would be a little careful about talking about how, if we are dialing back purchases, we are still adding accommodation because it's the accommodation relative to expectation. I'd be pretty cautious about going there. I think we want to make it clear

that the adjustments to the flow could go up or down. I don't think we want the market to assume that everything is monotonic, that once we start to move in a given direction that all of the things just start happening in phase. We want to make sure that there is an awareness that if conditions were to worsen again, we could actually up the purchase rate down the road.

We also want—as others have said, and I said yesterday—to make it clearer to people that this is about the outlook not the actual outcome, and it's about confidence in the outlook. So my outlook might not change, but I might be more confident in that outlook. That outlook might show slow improvement in the labor market and, if I became very confident about that outlook, that would also cause me to be more willing to ratchet down asset purchases.

The big challenge of the press conference, I think, is to make it clear to the market that adjustments to the flow downward will reflect greater optimism about the outlook, not worries about the benefit-and-cost tradeoff. We want to do this in an affirmative way that makes people feel that we are getting more comfortable with our progress as opposed to that we are running out of ammunition or we are getting more scared about the efficacy of our tools. It is very, very important to make sure it gets taken in the affirmative way that most of us think is appropriate. Thank you, Mr. Chairman.

CHAIRMAN BERNANKE. Okay. Thank you very much. I think there is a very strong majority for continuing the policy.

Let me address, I think, what is the most important question, and I have had in the last few minutes some back and forth in my own mind, which is the question of alternative B, paragraph 3. One way to deal with this, as Governor Tarullo suggested, would be to compromise between B(3) and B(4) and to cut “current” out of B(3) and “continue to” out of B(4)—offsetting changes.

Listening to the last few folks, I would like to ask whether there is any willingness to follow President Williams's suggestion and use the old B(3). And I'll tell you why I think that might be the best thing to do. It's not the complexity; it's not the differences in wording. What is the headline? What do we want people to take away from this? We want them to take away that we will respond to changes in the outlook, and we expect to be tapering not because we expect to discover new costs between now and June, but because we expect the economy to be getting better. So I think even those of us who are very eager to slow the process of purchases would like to do that because of economic strengthening rather than because of elevation of the costs and risks of the program. I don't want to double-cross anybody. I was talking to my colleagues here to the left about these changes. I don't want to make changes unless people are very broadly comfortable with them. Governor Powell, how do you feel about that?

MR. POWELL. I would say I like it the way it is without "current." Having said that, I'm perfectly comfortable with that. If you have a feeling like the one you just expressed, I'm okay with that.

CHAIRMAN BERNANKE. Okay. Thank you. Again, it's not a question of market impact or whatever. It's just a question of what message we want to send. The message we want to send is that we think we might taper, but we think we might taper because we think the economy is getting better, not because we've found some fatal flaw. Jeremy, is that okay?

MR. STEIN. Yes. I certainly agree that that is the desired path. I thought Dan put it well, which is we'd like to come out of this with a little bit more optionality. And so I'm sort of trading the two, but I agree with Jay. If you feel this is the more constructive way to go, I'm happy to go along with it.

CHAIRMAN BERNANKE. Are others okay with that change?

VICE CHAIRMAN DUDLEY. So paragraph 3 goes back essentially to the way it was before.

CHAIRMAN BERNANKE. We just get rid of the changes in B(3) and go back to exactly the way it was in January. So it will say, “. . . to support a stronger economic recovery and to help ensure that inflation, over time, is at the rate most consistent with its dual mandate, the Committee”—well, I’ll tell you what. We can keep “decided to,” if that will help you. President Fisher.

MR. FISHER. Actually, I favor what you suggested, Mr. Chairman. The old first sentence basically says what we stuck in the last sentence. So there’s not a whole lot of change there. In other words, what was crossed out here, you’re suggesting we go back to the old language we had. Is that correct?

CHAIRMAN BERNANKE. Right.

MR. FISHER. Yes. Well, if you look at the last sentence, this is—

CHAIRMAN BERNANKE. That comes out.

MR. FISHER. Yes. It comes out because it’s in the first sentence in the old statement.

CHAIRMAN BERNANKE. Yes.

MR. FISHER. So there’s not much change there.

CHAIRMAN BERNANKE. We’re getting rid of the part about the “current assessment of the likely efficacy and costs.”

MR. FISHER. I like your recommendation. In fact, I had argued it with my own staff, and I got talked out of it. But I would keep it the way it was.

MS. DUKE. I absolutely think it should go back to the original.

CHAIRMAN BERNANKE. All right.

MS. DUKE. But I do like “decided to.”

MR. FISHER. I like “decided to.”

CHAIRMAN BERNANKE. All right. My proposal is to go back to the original, put in “decided to,” but as a compensation for that, I don’t think I want to change to “intends to” as well, if that’s okay.

All right. That is the biggest thing I wanted to raise. As far as the other concerns, I am indifferent about “pause” versus “slowdown.” Mr. Wilcox, do you know what the current estimate of fourth-quarter GDP growth is?

MR. WILCOX. Six-tenths.

CHAIRMAN BERNANKE. Six-tenths.

VICE CHAIRMAN DUDLEY. It sounds like a pause to me.

MR. WILCOX. Six-tenths. That would be an annual rate, as always.

CHAIRMAN BERNANKE. Any reaction? [No response] Okay. Well, we had “pause” before. On “economic growth” and “pick up over time,” I don’t think we can do that, since we haven’t done it before, and we have always had this pattern of projections. I don’t feel strongly about “continue to” in the next-to-last line of B.4. Anybody have a view on that? The suggestion was to cut that.

VICE CHAIRMAN DUDLEY. But my view is just that we are continuing to. To say we “will” acts like all of a sudden we’re—

CHAIRMAN BERNANKE. Okay.

MS. DUKE. I like “continue to” because everybody knows we have just had a discussion of costs and efficacy. And so I do like the fact that that is a continuing conversation. If you don’t, just striking “as always” seems a little bizarre.

CHAIRMAN BERNANKE. Okay. Let's leave "continue to." Let's see, President Fisher, I think I still have the view that your C(1) is a little bit too strong.

MR. FISHER. I'm actually happy with the conversation, Mr. Chairman, particularly given the way you're going to interpret it to the press. Be positive. Vice Chairman Dudley made a very important point. The tone should not be that we have run out of stuff, the tone should be that we see improvements.

CHAIRMAN BERNANKE. Right.

MR. FISHER. I'm happy. Thank you, Mr. Chairman, for considering that.

CHAIRMAN BERNANKE. I have mixed feelings about "benefits" versus "efficacy." I don't think we want to change it now.

Just a comment on Governor Powell's remark about tools. I am somewhat constrained by the fact that I can't raise possibilities that haven't been discussed in the Committee. Now, one thing I have already, for better or worse, raised in public was not selling MBS. But I will almost certainly say something about the fact that the Committee will be looking at the exit principles over the next few meetings, and, if asked about MBS, I will say that is one possibility. Yes?

MR. KOCHERLAKOTA. Mr. Chairman, and maybe this pushes too far, but I think that it is useful to reiterate a lesson that we have heard many times around this table that the decisions we make about our exit strategy actually do have implications not just for exit but also for the stimulus we're supplying today. So mentioning that connection could be helpful.

CHAIRMAN BERNANKE. The connection you would make in public would be with respect to the accommodation related to exit.

MR. KOCHERLAKOTA. Yes.

CHAIRMAN BERNANKE. Not to smoothing remittances or something like that.

MR. KOCHERLAKOTA. No. I'm just saying that our exit strategy, what we decide about that, has implications for the current level of accommodation.

CHAIRMAN BERNANKE. Exactly.

MR. POWELL. And MBS sales specifically. I'm not sure if we mentioned that connection with respect to MBS sales, but I think we can.

CHAIRMAN BERNANKE. Okay. President Fisher.

MR. FISHER. I apologize. I'm a little confused here. Are you ruling out selling MBS?

CHAIRMAN BERNANKE. No. Absolutely not. Okay. So to summarize, I believe that we have no changes in B(1), no changes in B(2) except the one that is shown there already. For B(3), we are getting rid of all of the changes except for "decided to." We're going back to the January B.3., but we'll say, ". . . the Committee decided to continue purchasing." And I guess no change in B(4) either. Is that everyone's understanding? And no changes in B(5), where there were no changes proposed. All right? Debbie, would you call the roll?

MS. DANKER. Yes. This vote is on the version of the statement that the Chairman just described and the associated directive.

CHAIRMAN BERNANKE. Would anyone like to hear it again? [No response] Okay.

MR. WILLIAMS. Thank you for asking.

MS. DANKER.

Chairman Bernanke	Yes
Vice Chairman Dudley	Yes
President Bullard	Yes
Governor Duke	Yes
President Evans	Yes
President George	No
Governor Powell	Yes
Governor Raskin	Yes
President Rosengren	Yes
Governor Stein	Yes
Governor Tarullo	Yes
Governor Yellen	Yes

CHAIRMAN BERNANKE. Thank you very much. What time is lunch?

MS. DANKER. In five minutes.

CHAIRMAN BERNANKE. Lunch will be available, for those who would like to stay.

There is no program or anything during lunch.

You know, we have changed the timing. The statement will now come out at 2:00 for every meeting. My press conference, for meetings where there is a press conference, will start at 2:30, and, if you are interested, it will be shown in the Special Library. The only other thing I have to do is remind you that the next meeting is Tuesday and Wednesday, April 30 and May 1. Thank you.

END OF MEETING