

**Meeting of the Federal Open Market Committee on
November 1–2, 2016**

A joint meeting of the Federal Open Market Committee and the Board of Governors was held in the offices of the Board of Governors of the Federal Reserve System in Washington, D.C., on Tuesday, November 1, 2016, at 10:00 a.m. and continued on Wednesday, November 2, 2016, at 9:00 a.m. Those present were the following:

Janet L. Yellen, Chair
William C. Dudley, Vice Chairman
Lael Brainard
James Bullard
Stanley Fischer
Esther L. George
Loretta J. Mester
Jerome H. Powell
Eric Rosengren
Daniel K. Tarullo

Charles L. Evans, Patrick Harker, Robert S. Kaplan, Neel Kashkari, and Michael Strine,
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

Brian F. Madigan, Secretary
Matthew M. Luecke, Deputy Secretary
David W. Skidmore, Assistant Secretary
Michelle A. Smith, Assistant Secretary
Scott G. Alvarez, General Counsel
Michael Held, Deputy General Counsel
Steven B. Kamin, Economist
Thomas Laubach, Economist
David W. Wilcox, Economist

Thomas A. Connors, Troy Davig, Michael P. Leahy, Stephen A. Meyer, Ellis W.
Tallman, Christopher J. Waller, and William Wascher, Associate Economists
Simon Potter, Manager, System Open Market Account

Lorie K. Logan, Deputy Manager, System Open Market Account

Matthew J. Eichner,¹ Director, Division of Reserve Bank Operations and Payment
Systems, Board of Governors; Michael S. Gibson, Director, Division of Banking
Supervision and Regulation, Board of Governors; Nellie Liang, Director, Division of
Financial Stability, Board of Governors

¹ Attended the discussions of the long-run monetary policy implementation framework and financial developments.

Margie Shanks, Deputy Secretary, Office of the Secretary, Board of Governors

James A. Clouse, Deputy Director, Division of Monetary Affairs, Board of Governors

Trevor A. Reeve, Senior Special Adviser to the Chair, Office of Board Members, Board of Governors

Andrew Figura, Joseph W. Gruber, and Ann McKeehan, Special Advisers to the Board, Office of Board Members, Board of Governors

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

Eric M. Engen and Michael G. Palumbo, Senior Associate Directors, Division of Research and Statistics, Board of Governors; Gretchen C. Weinbach,² Senior Associate Director, Division of Monetary Affairs, Board of Governors; Beth Anne Wilson, Senior Associate Director, Division of International Finance, Board of Governors

Antulio N. Bomfim, Ellen E. Meade, Robert J. Tetlow, and Joyce K. Zickler, Senior Advisers, Division of Monetary Affairs, Board of Governors; Brian M. Doyle, Senior Adviser, Division of International Finance, Board of Governors; Jeremy B. Rudd, Senior Adviser, Division of Research and Statistics, Board of Governors

Jane E. Ihrig³ and David López-Salido,³ Associate Directors, Division of Monetary Affairs, Board of Governors; John J. Stevens, Associate Director, Division of Research and Statistics, Board of Governors

Min Wei, Deputy Associate Director, Division of Monetary Affairs, Board of Governors

Stephanie R. Aaronson and Glenn Follette, Assistant Directors, Division of Research and Statistics, Board of Governors; Elizabeth Klee, Assistant Director, Division of Monetary Affairs, Board of Governors

Eric C. Engstrom, Adviser, Division of Monetary Affairs, and Adviser, Division of Research and Statistics, Board of Governors

Penelope A. Beattie,³ Assistant to the Secretary, Office of the Secretary, Board of Governors

Dana L. Burnett, Section Chief, Division of Monetary Affairs, Board of Governors

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

Kurt F. Lewis,³ Principal Economist, Division of Monetary Affairs, Board of Governors

² Attended the discussion of the long-run monetary policy implementation framework.

³ Attended Tuesday session only.

James M. Lyon, First Vice President, Federal Reserve Bank of Minneapolis

David Altig, Ron Feldman,³ Jeff Fuhrer, Beverly Hirtle, Glenn D. Rudebusch, and Daniel G. Sullivan, Executive Vice Presidents, Federal Reserve Banks of Atlanta, Minneapolis, Boston, New York, San Francisco, and Chicago, respectively

Michael Dotsey, Antoine Martin,³ Susan McLaughlin,³ and Julie Ann Remache,³ Senior Vice Presidents, Federal Reserve Banks of Philadelphia, New York, New York, and New York, respectively

Deborah L. Leonard,³ Ed Nosal,³ and Anna Paulson,³ Vice Presidents, Federal Reserve Banks of New York, Chicago, and Chicago, respectively

Patrick Dwyer,³ Assistant Vice President, Federal Reserve Bank of New York

Andreas L. Hornstein, Senior Advisor, Federal Reserve Bank of Richmond

Anthony Murphy, Economic Policy Advisor, Federal Reserve Bank of Dallas

Jonathan Heathcote, Monetary Advisor, Federal Reserve Bank of Minneapolis

**Transcript of the Federal Open Market Committee Meeting on
November 1–2, 2016**

November 1 Session

CHAIR YELLEN. Good morning, everybody. As usual, this meeting will be a joint meeting of the FOMC and the Board of Governors. I need a motion to close the Board meeting.

MR. FISCHER. So moved.

CHAIR YELLEN. Thank you. Without objection. And, as many of you know, Nellie Liang and Mike Leahy have announced that they will be retiring, and this will be their last FOMC meeting. Nellie began her career at the Board in 1986 when she joined the Division of Research and Statistics as an economist, and she worked on a variety of financial issues over the course of her career. Nellie was a key participant in crafting the Federal Reserve's response to the financial crisis. She helped lead a number of crisis-era programs, including the 2009 Supervisory Capital Assessment Program, or bank stress tests, which played an important role in increasing public confidence in the banking system and set the template for our ongoing CCAR program. In 2010, she was appointed founding director of the newly created Office of Financial Stability Policy and Research, which went so well that it is now the Division of Financial Stability. As director, she led the effort to establish our new financial stability monitoring and policy framework. Nellie started attending FOMC meetings in 2005 and has attended a total of 53 meetings.

Mike first joined the Board as a research assistant in the Division of International Finance on a break from his Ph.D. work. After returning to graduate school and completing his studies, he rejoined IF and then rose steadily through the ranks, becoming deputy director in 2012. Along the way, Mike made innumerable contributions to the work of the division, the Board, and

the FOMC as one of our leading experts on exchange rates and monetary policy. Including today's meeting, Mike has attended 55 FOMC meetings since his first meeting in 2004.

Nellie and Mike, we are all truly grateful for everything that you have done for the Federal Reserve, and we wish you the best in your well-deserved retirements. [Applause]

Before turning to the first agenda item, I would like to recognize Governor Fischer as chairman of the communications subcommittee.

MR. FISCHER. Thank you, Madam Chair. I would like to provide some advance notice on changes to the policy on external communications that the subcommittee on communications will be proposing when we conduct our annual review of FOMC organizational documents in January. In particular, we would like to align the start of the blackout period more closely with the start of our serious discussion of the monetary policy alternatives.

Under our current practice, Committee participants receive the first draft of the alternative policy statements on the Friday 11 days before the beginning of the FOMC meeting. That is assuming the usual Tuesday–Wednesday meeting schedule. But our blackout period on external communications commences at midnight eastern time 7 days before the beginning of the meeting. The circulation of the draft policy statements marks the start of our deliberative process for the coming FOMC decision, a process that the blackout period is intended to foster and to protect. That means that we currently face a gap between the time our deliberations begin and the start of the blackout period. And we are investigating ways to close this gap. In the meantime, I urge all of us to be very careful in our public communications—which I'm sure we all are most of the time—particularly during the time period in question.

In addition to this modification, in January we will also be suggesting some clarifications of the blackout policy, particularly as it relates to the staff and their possible participation in

conferences and during the blackout period. The subcommittee will circulate a memo describing all proposed changes sometime before the December meeting. Thank you.

CHAIR YELLEN. Any questions or comments for Governor Fischer? Okay. Then let's turn to the first item on our agenda, which is "Long-Run Framework for Monetary Policy Implementation." Troy Davig is going to start off our presentations.

MR. DAVIG.¹ Thank you Madam Chair. We will be referring to the materials titled "Material for Briefing on Long-Run Monetary Policy Implementation Framework." The briefings today summarize the work of the latest phase of the long-run framework project. As you are aware, this has been a Systemwide project featuring contributions from the Board and all Reserve Banks. In addition to the presenters at the table, there were several additional coauthors on the main memos, including Ron Feldman, who is also present and available to answer questions. Following on the foundational work presented at the July meeting, which covered money markets, foreign experiences, and lessons from the crisis, this phase of the project focused on issues related to possible policy rate targets and operating regimes as well as considerations regarding the balance sheet. In general, the combination of these elements comprises the key aspects of an operating "framework."

The scope of this project was outlined now over one year ago, with three broad objectives listed on page 3 of your briefing packet. The first project objective was that any framework needs to achieve an appropriate degree of short-term interest rate control, including in periods of financial distress and in a manner robust to structural changes in the financial system. As the briefings by Jane Ihrig and Antoine Martin will highlight, this objective can be achieved using different policy rates and with a range of operating frameworks, which could vary in the use of ceiling and floor facilities, the level of reserves, and the breadth of counterparties.

The second objective was that a framework should enhance the ability to achieve macroeconomic and financial-stability objectives at the effective lower bound. Here the work reveals that the ability to effectively respond to the effective lower bound does not create sharp distinctions across operating regimes, though some operating regimes would require adjustments at the lower bound. In addition, maintaining operational readiness is important, particularly if the Committee intends to possibly use asset purchases or other tools that are not used routinely as part of the day-to-day operational framework. In terms of balance sheet policy, Deborah Leonard and David López-Salido will discuss how the balance sheet can be used to support interest rate control as well as macroeconomic goals and financial stability.

¹ The materials used by Mr. Davig, Ms. Ihrig, Mr. Martin, Mr. López-Salido, Ms. Leonard, and Mr. Laubach are appended to this transcript (appendix 1).

The third objective was that a framework should support the System’s ability to address liquidity strains in money markets and support overall financial stability. Regarding liquidity strains, the work suggests there may be advantages to having separate lending facilities for different types of liquidity provision as well as a broad set of counterparties.

Tradeoffs often exist when decisions about one aspect of the framework can have implications for others, though there are exceptions. For example, the briefings will discuss arrangements that allow for some separation between decisions about the balance sheet and the policy rate, such as in the current framework. Decisions about various aspects of a framework, of course, can also have important implications from a political economy perspective.

In addition to the three project objectives I just discussed, there was a set of additional objectives listed on the top of page 4 of your packet that are addressed in today’s briefings. Finally, the Committee’s normalization principles and plans provided an additional set of criteria, also listed on page 4. In general, the issues discussed in the memos do not necessarily call for any near-term decisions about a long-run framework or for a need to make decisions about changes to the existing framework. Looking ahead, today’s discussion will help inform any additional staff work or dimension of the project that warrants further analysis. Thank you. With that, I will now turn the briefing over to Jane.

MS. IHRIG. Thanks, Troy. As noted on slide 6, the memo titled “Interest Rate Targets and Operating Regimes” analyzes several interest rates that you may wish to consider using as a policy rate and analyzes operating regimes designed to promote money market conditions consistent with the target policy rate. Antoine and I would like to thank Ron Feldman—our co-lead—and many staff from around the System who helped develop the ideas we are about to discuss.

The memo’s goal is to illustrate tradeoffs across a variety of policy implementation frameworks with respect to a few considerations, including the objectives Troy just outlined, to help the Committee begin evaluating features that it may want in a long-run framework. To start, on slide 7 we review some choices of policy rates. The policy rate serves the function of communicating the stance of policy as well as supporting transmission of monetary policy to broader financial conditions. The memo considers several overnight rates that can be grouped into money market rates and administered rates.

In terms of an unsecured rate, the Committee could continue with the federal funds rate as the policy rate or move to the overnight bank funding rate, or OBFR, which the Federal Reserve began to publish in March. A secured rate could be a general collateral Treasury repo rate, and the administered rates could be interest on reserves, such as excess or required, or an overnight reverse repurchase offering rate, an ON RRP rate.

The choice of the policy rate is an important factor affecting the selection of operating tools and the counterparties with which the Federal Reserve interacts to achieve interest rate control. This point can be seen by looking at the three illustrative frameworks presented in the memo. Your next slide summarizes case 1, in which the policy rate can be an unsecured market rate or the interest rate on excess reserves, and a key feature of the operating regime is that the Federal Reserve operates on the flat portion of the reserve demand curve. This case encompasses the current framework.

In this regime, floor tools, such as interest on excess reserves and the overnight RRP facility, are the main mechanism through which the framework influences the level of market interest rates. Ceiling tools could be useful to contain rate volatility, should it emerge, although a high level of excess reserves would put downward pressure on market rates. Reserve requirements and fine-tuning open market operations would be unnecessary in this framework.

A question, though, is: What is the appropriate level of reserves? Policymakers would need to evaluate tradeoffs with relatively large and small balance sheets with respect to issues such as financial stability and macroeconomic objectives that Debby and David will soon discuss as well as payment system efficiencies and political economy risks.

Case 2, described on your next slide, has similarities to the pre-crisis system. The policy rate can be an unsecured market rate or the interest rate on required reserves. The Federal Reserve would operate on the steep portion of the reserve demand curve and actively manage the supply of reserves to control interest rates. A key tool in this type of framework is reserve requirements, either mandatory or voluntary, to establish a fairly stable and predictable downward-sloping reserve demand curve. Discretionary open market operations would also play an important role in offsetting volatile autonomous factors affecting the supply of reserves.

Ceiling and floor tools can play important roles in this framework to limit the volatility of interest rates. Indeed, operating on the steep portion of the reserve demand curve could lead to greater interest rate volatility than in the previous case. Historically, the discount window was intended to limit upward spikes in the policy rate, and Antoine will discuss a possible variant of the discount window that could help establish a more effective ceiling. In terms of a floor, interest on excess reserves would be the primary tool in the framework. In times of stress, the Federal Reserve could use sterilization tools to remain in this regime or use interest on excess reserves, or possibly an overnight RRP facility if the tool was in the regime, to transition to a floor system.

Case 3, which is noted on slide 10, focuses on the repo market. The policy rate in this case could be a measure of the general collateral Treasury repo rate or the overnight RRP offering rate. The operating regime would focus on the supply and demand conditions in the repo market. As discussed in some of the staff memos, the quantity of reserves and the setting of interest on excess reserves would remain

important factors influencing repo market conditions. In this framework, an overnight repurchase facility may be desirable to limit unwanted upward spikes in money market rates, and an overnight reverse repurchase facility would be desirable in order to limit downward spikes in repo rates.

The number and type of counterparties as well as the cap and offering rate settings on an overnight RP and overnight RRP facility would affect the interest rate control. If the objective was to maintain the policy rate within a reasonable broad range, the framework could function very much like the current one, but if, instead, you wanted to target a much narrower range, or a point target, then fine-tuning open market operations might be desirable.

It would be important to consider how the use of standing and discretionary open market operations affect the level of reserve balances, which influence the effect of unsecured rate volatility. Policymakers may prefer to operate with abundant reserves in this regime for this reason, and, in this situation, reserve requirements and discretionary open market operations may not be necessary.

Your next three slides evaluate the three cases with respect to the long-run framework objectives. As mentioned by Troy, one key conclusion is that, in normal times, interest-rate control can be achieved in the case of a wide range of potential policy rates through the appropriate choice of operating regime tools, and the policy rates will likely also effectively transmit the stance of policy to broader financial conditions and the real economy. Interest rate control would be maintained at the effective lower bound as well, although it might require some changes in operating regimes in some cases.

Turning to your next slide, the memo highlights a difference between the regimes with respect to how they mitigate liquidity strains. Regimes that operate on the flat part of the demand curve for reserves, such as in case 1, can easily accommodate liquidity injections, as the increase in the level of reserves does not affect money market rates much. In contrast, when operating on a steep portion of the demand curve for reserves, as in case 2, interest rate control can be maintained by using reserve sterilization tools. Alternatively, this framework could transition to case 1 by raising the level of interest on excess reserves. In a repo regime, you could rely on the overnight RRP facility and interest on excess reserves to support the policy rate.

Other long-run framework objectives are mentioned on the next slide. In all cases, burdens of mandatory reserve requirements could be reduced or eliminated. Reserve requirements could be set to zero in case 1 and possibly case 3, while voluntary reserve targets could be considered in case 2. All regimes support active money markets, although only regimes that operate on the steep portion of the demand curve for reserves would support an active interbank market. Finally, payment system efficiency is achieved in different ways across the regimes. In particular, frameworks featuring high levels of reserve balances facilitate early payment settlements, a state of affairs that delivers this objective directly. Meanwhile, regimes characterized by low levels of reserve balances would rely on

the Board's existing payment system risk policies to achieve payment efficiencies through the provision of free collateralized daylight credit. I will now turn the presentation to Antoine to summarize the key considerations across the cases.

MR. MARTIN. Thanks, Jane. Slide 14 provides a summary of some of the salient considerations associated with each of the three cases. The first two rows concern the policy rate. As noted in row 1, the choice of policy rate would be familiar in cases 1 and 2, particularly if the Committee chose to continue targeting the federal funds rate or move to the closely associated overnight bank funding rate. The interest rates paid on reserves, both required and excess, have been used in FOMC communication, so they are also familiar. In case 3, a market repo rate or the overnight RRP offering rate, which represent risk-free rates, would be less familiar to market participants and a more significant change.

Row 2 notes that case 1, using the federal funds rate as the policy rate, would not be robust to a significant reduction in federal funds lending by Federal Home Loan Banks. Those concerns would be mitigated by the OBFR, particularly if that rate could be broadened to include onshore wholesale deposits. These concerns would be lessened in case 2, as an interbank market would likely reemerge. There are few robustness concerns associated with a repo rate.

The next three rows concern properties of the operating regime. In row 3, case 1 would be particularly simple to operate in normal times, even if the Committee wanted to supply a smaller quantity of reserves than at present. Case 2, while familiar from the pre-crisis experience, is more complicated. Case 3 would be least familiar, although the experience of the last few years suggests that it could work like the current operating regime.

As noted in row 4, since the level of reserves doesn't affect interest rates much in case 1, injecting liquidity in times of market stress would not be an issue. In contrast, sterilization tools would be needed in case 2, or the regime would have to transition to case 1. Liquidity provision may not be an issue in case 3 if this framework operated with the supply of reserves intersecting the flat part of the demand for reserves. For similar reasons, cases 1 and 3 could remain unchanged at the effective lower bound, as noted in row 5, whereas case 2 would likely have to transition to a framework like case 1 in instances of large-scale asset purchases.

Row 6 concerns reserve requirements. These requirements could be set to zero in case 1, as they would not play any role in a regime that operates on the flat portion of the reserve demand curve. To operate on the steep part, as in case 2, reserve requirements could be maintained, or you could consider voluntary reserve targets, which would reduce some of the costs associated with reserve requirements. Reserve requirements could also be set to zero in case 3 if operating with abundant reserves.

Finally, row 7 discusses political economy risk. Some risks are associated with having a relatively large balance sheet, as could happen in cases 1 and 3. Case 2 likely represents the lowest amount of political economy risk, because it could be

accompanied by a smaller balance sheet and money market rates would be above IOER.

Slide 15 discusses considerations for a ceiling tool that may be relevant for any of the cases Jane reviewed, with some focus on the discount window. Historically, the discount window has been used for three purposes: to help support interest-rate control, to provide liquidity to address broad-based market funding pressures, and to provide liquidity to individual firms facing idiosyncratic liquidity shocks. Stigma—the reluctance of an institution to access a central bank’s standing lending facility out of concern that, if detected, it could be interpreted as a sign of financial weakness—is perhaps most closely related to the third role. But because use of the discount window does not distinguish the motivation, the presence of stigma for that one purpose likely prevents the discount window from performing all roles effectively.

Policymakers may want to consider options to reduce stigma. One approach, as Troy mentioned, is to establish separate facilities, one for each role, which may allow some tools to work more effectively. The memo provides two examples of facilities that may act as a more robust ceiling for interest rate control. Policymakers could consider introducing a depository institution repo facility (DIRF) or a financial institution repo facility (FIRF). These facilities would be established under Section 14 authority for open market operations. More work could be done on considering the effectiveness of these facilities and other options could also be considered.

These ceiling tools could be used alongside the discount window, which would only address individual liquidity needs, and a version of the term auction facility, or TAF, which could be considered for broad-based liquidity needs. Slide 16 considers the degree to which these types of liquidity backstop might be incorporated into the framework. For example, the discount window and swap lines are “integrated” into the current operating regime—that is, they are continuously available as part of the monetary policy implementation framework. A potential drawback of integration is that integrated tools are more likely to lead to moral hazard compared with other approaches. The degree of integration could range from fully integrated tools to those that are less integrated and made available only under some preannounced conditions. Or, tools could be left inactive, such as the TAF is now, with no specific preannounced conditions under which it would be used again.

Slide 17 discusses the breadth of the counterparty framework. In normal times, a narrow set of counterparties may reduce the risk of distorting markets but could be seen as providing privileges to a few institutions. A broader set of counterparties for liquidity provision tools could be viewed as more inclusive but might also increase the risk of moral hazard or of political scrutiny. However, in times of stress and perhaps in normal times, it might be advantageous to have broader reach in markets, for both OMO and liquidity facilities, to help with interest-rate control and transmission. These tradeoffs would need to be considered as the Committee moves forward with building a long-run framework. I will now turn the discussion over the David to begin the presentation of the balance sheet workgroup’s findings.

MR. LÓPEZ-SALIDO. Thank you, Antoine. Debby and I will now present findings made by the balance sheet workgroup, which we co-led with Fabio Natalucci. As noted on slide 19, we were tasked with exploring a range of issues that are relevant in determining the longer-run size and composition of the Federal Reserve's balance sheet. I will start with a discussion of the roles that you might want the balance sheet to play in the long-run framework. These roles include interest rate control, achieving macroeconomic objectives, and supporting financial stability. Debby will then discuss the implications that choices about the balance sheet objectives may have for the design of the System Open Market Account as well as the fiscal and political economic considerations related to use of the balance sheet as an active policy tool.

In slide 20, if effective interest rate control is the only role assigned to the balance sheet, its size would likely be determined primarily by currency in circulation, other autonomous factors, and the level of reserve balances associated with the central bank's operating regime. As Jane and Antoine illustrated, interest-rate control can be achieved with either a small or a large balance sheet. Just as the choice of the operating regime can influence the size of the balance sheet, decisions to use the balance sheet as an active policy tool to achieve macroeconomic goals or promote financial stability may also have implications for the operating regime. For instance, if policymakers wished to maintain elevated levels of reserves to foster financial stability, they would need to rely heavily on policy tools such as IOER, overnight RRP, or voluntary reserve targets to control interest rates effectively.

Slide 21 addresses the balance sheet's use to support macroeconomic objectives. A large research literature has documented the point that, through a number of channels, large-scale purchases of longer-term assets can lower term premiums and long-term bond yields and boost prices of various other financial assets. These changes in financial conditions support stronger economic growth and higher inflation. The experience of central banks since the crisis suggests that asset purchases have appreciable macroeconomic benefits when the effective lower bound binds, especially in the event of stressed market conditions.

Economic theory would suggest using all available tools, especially in the presence of multiple goals. However, policymakers would have to coordinate the use of multiple policy tools. Communicating the nature of the central bank's multidimensional "policy reaction function" could be challenging. Moreover, the ongoing use of asset purchases could affect financial markets in ways that are difficult to anticipate.

Policymakers may therefore assess the tradeoffs between the benefits and costs of active use of the balance sheet differently at the effective lower bound versus away from it. One possible approach would be to use the changes in the size and the composition of the balance sheet to achieve macroeconomic objectives only when the policy rate is constrained at the effective lower bound or during periods of stressed market conditions, and then revert to its passive role and prior structure at other times. This strategy would seek to preserve space that permitted future use of expanding the

balance sheet by holding a relatively small balance sheet and a low level of duration risk outside the effective lower bound episodes.

There may also be benefits of using the balance sheet actively away from the effective lower bound, although the case may be less clear. In a post-crisis “new normal” characterized by a low equilibrium real rate, there will be less room than in the past to cut the policy rate in response to a recessionary shock, and there may be more frequent, and potentially longer, spells at the effective lower bound. An open question is whether a permanently large balance sheet would permanently reduce the risk premiums and thus it would raise the equilibrium real risk-free rate. If that is the case, from an *ex ante* viewpoint, holding a large balance sheet that bears a relatively high level of duration risk away from the effective lower bound might create additional scope to cut interest rates in the event of a recessionary shock. This strategy might help to limit the frequency of episodes at the effective lower bound. However, this same strategy could present, *ex post*, some costs of having less space to expand the balance sheet further should short-term rates still fall to the effective lower bound.

In either case, the macroeconomic effectiveness of any purchase or sales program will depend a great deal on the public’s understanding of the Committee’s reaction function and its stopping rule for using balance sheet tools, in conjunction with forward guidance on the short-term interest rate.

I will now turn to ways the Federal Reserve’s balance sheet could be used to promote financial stability. I would like to preface this discussion by noting that, currently, there is only a small research literature on this topic and no real consensus. As shown on slide 22, policymakers might consider several financial stability objectives. During periods of stress in financial markets, asset purchases could be used to promote market liquidity and improve market functioning. The Federal Reserve’s first asset purchase program, initiated at the height of the crisis, likely helped along these dimensions.

Outside periods of stress, the balance sheet might also, in principle, be used preemptively to reduce the vulnerabilities in the financial sector. One of those vulnerabilities could arise from privately created, short-term, money-like assets. In normal times, investors perceive such assets to be safe and liquid, but sudden changes in investors’ perceptions can lead to stressed market conditions. Those changes were powerful catalysts for instability during the financial crisis. In light of these considerations, a recent literature has suggested that a greater supply of publicly provided money-like assets may be able to crowd out excessive creation of runnable, private money-like assets. Nevertheless, a great deal of additional research would be necessary before we would be able to assess the magnitude of the potential benefits of displacing privately supplied money-like assets.

Another vulnerability relates to the potential for excessive private maturity and liquidity transformation that arises from the shape of the yield curve. Some researchers have suggested that the Federal Reserve could flatten the yield curve by

buying long-term securities, and therefore, by increasing the costs of short-term borrowing relative to the yields on longer-term assets, reduce the amount of maturity transformation taking place in the private sector. However, there is very limited evidence on the responsiveness of liquidity and maturity transformation to changes in the yield curve. Finally, some observers have suggested that the Federal Reserve hold relatively few high-quality liquid assets in its portfolio to expand the quantity of the same assets available to financial institutions. Others have suggested that the Federal Reserve can “lean against the wind” in the housing market by adjusting its holdings of agency MBS and therefore influencing mortgage market conditions. This policy might be beneficial if the housing sector is viewed as an important channel affecting financial stability. Thank you. Debby will now continue our presentation.

MS. LEONARD. Thank you, David. David reviewed a number of roles the balance sheet could potentially play in the Federal Reserve’s future operating framework. Your eventual decisions about these roles will have implications for the design of the SOMA portfolio. Some instructive cases are summarized on slide 23.

A simple case might be to use the balance sheet passively to support short-term interest rate control and to deploy it as an active tool only when short-term rates are constrained by the ELB or during times of financial stress. Maintaining a portfolio in normal times that is somewhat greater than currency in circulation and other autonomous factors—but not substantially so—and that has a short average duration would preserve capacity to conduct maturity extension or large-scale asset purchase programs. Active use of the balance sheet at the ELB or in stressed market conditions would then mean expanding the portfolio’s size, lengthening its maturity, or changing its asset composition—then reverting to its previous structure when conditions warrant.

A limitation of this strategy is its assumption that the balance sheet can be normalized before it is expanded again. Under this approach, the portfolio’s size and composition are not necessarily choice variables; they depend on economic developments. With a persistently low r^* suggesting that spells at the ELB may become more frequent or persistent, there is a risk of an ever-increasing balance sheet.

Using the balance sheet to support macroeconomic objectives while away from the ELB or to promote financial stability in normal times would likely entail a relatively large balance sheet—driven by needs to supply a large quantity of Federal Reserve liabilities or to hold a large stock of assets—in order to achieve desired objectives. Different objectives, though, lead to different portfolios. For example, using the balance sheet as a macroeconomic tool away from the ELB might suggest holding a large amount of longer-term securities in order to apply downward pressure on term premiums. In contrast, positioning the portfolio to be able to flatten the yield curve suggests holding a large stock of shorter-term securities that could then be sold when the need arises. Meanwhile, a desire to increase the quantity of HQLA available to the private sector suggests weighting securities holdings toward agency MBS.

In slide 24, policymakers might consider a range of possible guiding principles for portfolio management, particularly insofar as there is some leeway in determining the composition of SOMA assets within the narrow limits established by the Federal Reserve Act. Three principles that guided portfolio management before the crisis were safety, market neutrality, and liquidity. The weight each of these concepts holds in a future portfolio will depend in part on your choices about operating regimes and long-run balance sheet objectives. Strategies that require substantial holdings of longer-term Treasury securities or agency MBS mean accepting some financial risk and potentially distorting relative prices or promoting credit allocation across sectors in order to achieve their policy objectives. While portfolio liquidity provides flexibility to sell assets in response to shocks, the need for sterilization capacity may be less important in an operating regime in which IOER and ON RRP can provide interest rate control. Even so, maintaining some short-term liquid assets in the portfolio might remain a priority if you see such holdings as potentially helpful in meeting policy goals in some economic or market circumstances.

Maintaining operational readiness in key financial markets might conceivably be considered a new principle, perhaps suggesting ongoing maintenance of at least a small agency MBS portfolio if you believe you could need to operate in this market sometime in the future. Return and transparency could conceivably become more prominent principles if the Federal Reserve runs a permanently large balance sheet. Transparency about balance sheet policies is important not only to enhance policy effectiveness, as David mentioned, but also to enhance accountability, by enabling the public and the Congress to judge whether the Federal Reserve's actions are consistent with its stated objectives. This is all the more important in light of possible fiscal and political economy issues that could accompany certain balance sheet strategies.

As noted on slide 25, monetary policy has fiscal implications regardless of the size and composition of the central bank's balance sheet. However, maintaining a persistently large balance sheet and using it as an active policy tool would accentuate fiscal and political economy issues.

One issue is the division of responsibility for debt management decisions between the Federal Reserve and the Treasury. Changes in the size and composition of the central bank's balance sheet can alter the liability structure and funding costs of the government. Different goals for the central bank and fiscal authority may, in certain circumstances, lead each to act in ways that are at cross purposes with one another.

A second set of issues pertains to the costs of funding a permanently large central bank balance sheet. Interest paid by the central bank to its counterparties can generate political pressures if such payments are viewed as unfair, unwarranted, or a subsidy. Additionally, to the extent that interest payments on central bank liabilities are simply a component of the government's overall interest expense, one might ask whether central bank liabilities are the least expensive way to finance the public debt.

Another set of issues arises when one considers the Federal Reserve as an independent entity that generates a stream of remittances to the Treasury. If the term

premium is positive, a larger and longer-duration balance sheet should lead to levels of income and remittances that are higher on average, but possibly more variable. Purchasing assets while term premiums are negative across the yield curve implies expectations of future negative net income associated with those assets. Of course, monetary policy has general equilibrium effects that have broad fiscal implications, including effects on public revenues and expenditures and rates at which the government finances its debt. Simulation results presented in our memo show how the overall fiscal impact of a large balance sheet can remain positive even when Federal Reserve income is weak.

Moreover, negative net income is not an impediment to executing monetary policy so long as losses are not so large as to impair the central bank's solvency—measured by the sum of net worth and the expected present discounted value from seigniorage. Nonetheless, balance sheet strategies that heighten the risk of losses could jeopardize the Federal Reserve's independence or ability to pursue its policy mandate should concerns about income losses call into question policymakers' commitment to raising rates when economic and financial conditions call for it. Thank you, and Thomas will now conclude the briefing.

MR. LAUBACH. Thank you, Debby. As Troy mentioned, the staff memos and presentations prepared for this meeting and for the July FOMC meeting are the culmination of over a year of effort by a large number of staff across the System. In total, the staff delivered over 500 pages of analysis on a very wide-ranging and complex set of topics. There will be a quiz before lunch on the details of these staff memos. [Laughter] Apart from the memos, over the past year the staff also hosted a number of research and policy conferences and other events to build a broader and deeper understanding of the issues; to draw on the insights and perspectives not only of staff throughout the Federal Reserve System, but also academics, market participants, and analysts at other central banks; and to inform the public.

As you might imagine, a project this large and complex required a more formal and extensive project management approach than is typical of FOMC projects. On behalf of the Executive Committee, co-chaired by Simon and myself, I'd like to thank everyone who helped keep the long-run framework trains running on time, including all the members of the Operating Committee—and particularly Julie Remache, the OC chair. I'd also thank all of the workgroup leads, the project management office, and a number of staff that helped with information technology and other technical and meeting support.

The very broad focus of the long-run framework project has provided a strong foundation for the analysis of related issues in coming years. The possible questions we provided for your discussion, shown on slides 27 to 29, are intended to elicit your views on any tentative conclusions you draw from the materials we presented so far. Going forward, we expect that follow-on work will be more targeted and focused on particular topics. These more targeted efforts will likely be conducted following the usual approach of convening a relatively small group of System staff as necessary to

work on particular topics over an FOMC cycle or two. And with that, we'd be happy to take your questions. Thank you, Madam Chair.

CHAIR YELLEN. Before beginning our discussion, I, too, would like to express my sincere thanks to all of the staff across the System who have contributed to the long-run framework project. A great deal of thoughtful work has gone into this project, and the documents we received for this meeting are clear, well organized, and highly informative. As we complete this phase of our work on the long-run framework, I would like to congratulate the staff for a tremendous effort.

To set the stage for a discussion, I think it's useful to review the timeline for when decisions about our longer-run implementation framework will likely need to be made. Clearly, there is no urgency at the moment. Our current implementation framework is working well and should continue to work well for the foreseeable future. So when might we need to act to either change or affirm our framework? It seems highly unlikely that we would need to take action while we are continuing our reinvestment policy. And even after we cease reinvestments, it will be quite some time until shrinkage of the balance sheet would force decisions. As noted in Tealbook B, the staff assumes that reinvestments will cease once the target range for the federal funds rate reaches $1\frac{1}{4}$ to $1\frac{1}{2}$ percent. Under the baseline, this occurs in the third quarter of next year. Thereafter, reserve balances decline at a pace of roughly \$650 billion per year. In the Tealbook projection, it will not be until late 2019 that reserve balances move below \$1 trillion, a level that is probably still ample enough to keep us operating on the flat portion of the reserve demand curve, as in our current floor-based system.

Now, waiting until reserves become scarce to make any decisions is surely not advisable, particularly as the public will long before then want some idea of where we are headed. That said, we still have much to learn about the future operation of money markets in the new

regulatory environment, including gaining insight into the factors that will affect the supply and demand for reserves. The significant changes in money markets over the past few months in response to the reforms affecting money market mutual funds is a good reminder that the world may look quite different in some important respects a year or two down the road.

Many of the questions that are before us today need not, and probably should not, be settled now. That being said, I think it is important that we remain engaged in considering these issues, and it's my hope that we can identify some specific areas for improvement in our implementation framework that will yield benefits regardless of our longer-run decisions. It will also be useful to get a sense of your general views on the bigger-picture questions regarding the choice of our policy rate, the operating regime, and use of the balance sheet. I am looking forward to hearing your views on these important issues. And with those remarks, let's start off with Q&A, and then we will go into a round of comments. Any questions for the staff? Vice Chairman.

VICE CHAIRMAN DUDLEY. I agree with all that you said, Madam Chair, in terms of not having to make decisions right now. But presumably there are some decisions that you might want to make now, just because there might be consensus and there might be a deadweight loss of not making that decision. The one that seems most obvious to me, potentially, is the reserve requirement. It doesn't seem, in the current regime, that required reserves has any great value, and it has administrative costs. It results in fewer high-quality liquid asset sales. I have a general question for the staff or anyone else. Do people feel like all this has to necessarily be deferred if there is consensus on issues like required reserves? I presume a determination on required reserves is a Board decision.

MR. MARTIN. Certainly, if the Committee felt comfortable raising them again later, should it decide to operate on the steep part of the demand curve, there would be a number of benefits to setting them to zero temporarily or permanently.

MS. IHRIG. I also think a significant amount of time would be required to get from here to a place like that. You could actually ask the staff for a proposal for what would be needed to get from here to there and continue thinking about it. So you wouldn't have to necessarily make a formal decision immediately. You could ask the staff for further work.

MR. POTTER. The only thing I would say is that it might signal something that you don't want to signal. So there have to be some overall context, I think, for a decision like that.

VICE CHAIRMAN DUDLEY. Thank you.

CHAIR YELLEN. Other questions for the staff? Okay. Seeing none, this is an opportunity to comment. I think, more or less, everybody has indicated that they would like to comment, so let's begin our go-round. Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you. I very much appreciate all of the work the staff has done on the long-run framework. I thought it was an extremely thoughtful and comprehensive, an absolutely excellent piece of work.

I think it is important to consider where we're headed, because it will influence what capabilities we have to have in the future. As the Chair has said, obviously time is on our side here, because we'll likely be in the current floor system for several years at a minimum, and any consensus that was reached by this Committee wouldn't necessarily be binding on future Committees. So that's relevant as well. But I still think it's worthwhile to do the work to have a good sense of where we're headed.

To answer the most important question, I think we should have a regime in which there are sufficient reserves in the banking system so we're operating on the flat portion of the demand curve. In my mind this type of regime has several important advantages. First, it's operationally quite simple. One doesn't have to forecast all of the autonomous factors that affect reserve balances and then add and drain reserves each day or week to keep the supply of reserves in balance with demand.

Second, it enables the financial system to operate more efficiently. Excess reserves facilitate larger liquidity buffers and reduce payment frictions. It also reduces the amount of interbank activity in which reserves are created from bank to bank. The memos talked about the robustness of the money markets. I think having robust money markets makes sense, but I don't see any bank activity per se as having a lot of value. It adds complexity to the system, but I don't think it adds value to the financial system. There are some regimes in which there's a lot of activity that takes place in moving reserves from banks that are long in reserves over to banks that are short of reserves that I don't think actually ends up generating a lot of benefits to the economy at large.

Third, a floor regime is robust at the effective lower bound on short-term interest rates. If you had a corridor system, reserves added by QE and special liquidity programs would have to be drained in order to maintain monetary control, and we saw in 2008 that this can be difficult to do. Sometimes you can actually lose monetary policy control.

Also, I think a corridor regime has one important negative aspect that maybe could be highlighted a little bit more. In 2007 and 2008, we were reluctant to enact large programs, and we didn't enact programs that were open-ended, because we were worried about how we would actually offset, by corresponding draining operations, the reserves added through such programs.

I think this is important, because open-ended backstop programs may actually be more effective than programs that are finite in magnitude in terms of supporting financial stability. That's because such backstops encourage private market participants to stay engaged rather than pull away, and the fact that they want to stay engaged, I think, does reduce the risk of financial panic somewhat.

Under a floor regime, we can expand the balance sheet without risk of losing monetary policy control or needing to conduct offsetting reserve draining operations, and I think that's important. Now, clearly, we don't need a \$4.5 trillion balance sheet to have such a regime. I agree with the staff that the amount of excess reserves could come down considerably. In conversations I've had with the staff, the general view has been that if you had \$1 trillion of excess reserves, you'd be highly confident that you'd have more than sufficient reserves to ensure that you'd stay on the flat part of the demand curve in a wide range of environments. I think you want to have enough with a margin of safety, and that would make a lot of sense.

With respect to some of the other issues raised in the long-run framework memos, many of them are second order relative to this issue of floor versus corridor system. For example, I think we could target any number of short-term interest rates, or we could have an administered rate, such as the IOER rate or the overnight repo rates, to serve as our short-term interest rate target. At the margin I prefer using an administered rate, such as the IOER rate or the overnight RRP rate. In enacting monetary policy, we don't care about the level of money market rates per se, but instead we care about the effects of our policy stance on financial market conditions more generally. So moving to an administered rate would appropriately shift the focus away from any particular level of a particular money market rate. I understand the IOER rate raises some governance issues, but I don't see why the Board of Governors wouldn't just decide to defer to

the FOMC on this matter or decide that the IOER rate would be set at a given spread relative to the overnight RRP rate. If we were to decide not to use an administered rate, which is my preference, I would prefer to shift away from the federal funds rate to another money market rate. The federal funds rate has become increasingly idiosyncratic. For me, I would either prefer the overnight bank funding rate or the GC Treasury repo rate.

Due to my preference to make a floor system permanent, I would also be completely in favor, as I said in my question earlier, of eliminating the reserve requirement, and I don't really see why we wouldn't just get on with that right now, because it does create a deadweight loss in the sense that it has a lot of administrative complexity, and required reserves, unlike excess reserves, don't count as high-quality liquid assets. It seems to me like there's a real gain in just getting rid of the reserve requirement.

I also think that if we were to adopt a floor system on a permanent basis, it might be worthwhile to review whether reserves should be part of the leverage ratio calculation. As I see it, there are two reasons to consider excluding reserves from the leverage-ratio calculation. First, the banking system does not control how many excess reserves it must hold. We do that by our policy decisions. I'd like to have a regime in which we didn't have to worry about whether a quantitative easing program would lose its effectiveness because the expansion of bank balance sheets was causing the leverage ratio to bite, thereby undermining the incentives that banks had to expand their lending.

Second, excluding excess reserves from the leverage-ratio calculation would create greater incentives to arbitrage the gap between other money market rates, such as the federal fund rate and the interest rate paid on excess reserves, and this would make monetary policy more efficient in that we'd be paying banks a lower interest rate for any given degree of

monetary policy stringency. Banks that hold more excess reserves are not riskier. Including such reserves in the leverage ratio calculation in my mind doesn't achieve any meaningful benefit in terms of safety and soundness of the banking system that we oversee.

So, two final thoughts. First, I'm not a big fan of actively using the balance sheet as a tool of policy when we're not at the effective lower bound on interest rates. While I understand we could, in theory, use the balance sheet to affect the shape of the yield curve, I think this benefit is offset by the fact that having two active tools would make communications more difficult. I also worry about our ability to anticipate how expectations would be affected by such balance sheet operations. If we were to change the balance sheet, would the reaction be mild or would we generate a taper tantrum? The balance sheet is simply a tool that we don't have much experience with. My preference is to keep it mostly in the background, except when we're at the lower bound and it is most needed.

Second, I do think we should continue to work on what we can do to rehabilitate our lender-of-last-resort facilities. I'm not sure what the right way forward is, but getting rid of stigma would be useful. One option would be to operate the TAF auctions on a regular basis, presumably at very small volumes at a rate slightly above the IOER rate. This would be similar to the foreign exchange swap operations that take place around the world today. They're little used during normal times but available to be used as needed if stress increases. Having a standing facility eliminates the tough decision of whether to bring it back or not and the difficult signal that it sends, because it would already be there. I think that has a benefit.

Another issue with respect to the lender of last resort is our inability to lend to broker-dealers outside of setting up a special 13.3 facility. There's obviously no easy solution here. I don't see the Congress as readily giving us this authority, but I do wonder whether the FDIC

might be more amenable to discussing Section 23(a) waivers now that it is on the hook when a SIFI with a broker-dealer has to be resolved under Title II, Single Point of Entry resolution. In the current regime, the inability to get funds to a distressed broker-dealer without invoking 13.3 remains a real vulnerability. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Lacker.

MR. LACKER. Thank you, Madam Chair. The materials provided by the work groups make clear that there are a number of alternative monetary operating regimes that achieve very similar results with regard to interest-rate control. When comparing alternatives, I place considerable importance on simplicity and transparency, because these characteristics facilitate clear communication with the public and support monetary policy independence. So I find myself drawn to a relatively parsimonious regime in which the interest rate on excess reserves, an administered rate, is our main policy instrument and enough reserves are supplied so as to operate constantly on the flat portion of the demand curve. Such a regime would achieve our interest-rate control goals in a way that is easy to communicate and requires little or no supplementary tools. Such a regime would also minimize operational challenges and complexity, and the admittedly limited evidence we have suggests that the link between interest on reserves and other short-term interest rates is quite strong.

This type of parsimonious framework could work with a balance sheet that is small relative to where we currently are but relatively large compared with the pre-crisis balance sheet. Based on the preliminary quantitative assessments provided by the work groups, the volume of reserves needed may fall somewhere in the \$600 billion to \$800 billion range. We would be able to learn, though, as we implemented such a regime, more about how much is required, and the exact amount might vary over time. But we should be able to manage it with a program of just

occasional outright purchases and sales of Treasury securities and without having to conduct day-to-day market interventions, as we did with our previous regime.

There are a number of valuable features of this parsimonious regime. It would obviate the need for reserve requirements. I endorse Vice Chairman Dudley's suggestion that we get on with that if we can. It would also obviate the need for the overnight reverse repurchase program, which I think is superfluous in the current set-up. A particularly valuable feature is that the volume of reserve balances should be enough to accommodate the System's payment settlement needs without much use of daylight credit from the Federal Reserve. This would make for a more efficient payments system and would reduce the risk of large credit extensions necessitated by operational failures, as occurred in 1985 or on 9/11.

I also believe that flexibility and resilience are important because it can be hard to predict how the financial system is going to evolve. The ongoing shift from prime to government money market funds you mentioned, Madam Chair, is a good example. Another is the erosion of Eurodollar volume that is now necessitating a reexamination of scope of our newly minted overnight bank funding rate. A framework that relies on an administered rate in the flat portion of the demand for reserves seems more likely to be robust to potential changes in the structure of money markets or banking regulations that might affect the behavior or economic significance of various market rates.

Of course, using an administered rate as our main policy rate does not mean that we have to ignore market rates. It might make sense, perhaps for an interim period, to continue to articulate our expectations that certain market rates will trade in a certain range determined by the IOER rate. But if so, I think that we should state such expectations broadly enough to make clear that we do not take much signal from highly transitory fluctuations in particular rates, such

as the blips we often see at quarter-end. Although we should be attentive and well informed about such fluctuations, they can have many sources, and most have little or no implications for the stance of monetary policy.

Another reason to set policy in terms of an administered rate is the fact that there are counterparty credit risk premiums embedded in many market rates. These may be generally negligible in normal times, but at other times, movements in market rates reflect changes in the distribution of risk premiums charged to private-sector borrowers. August 2007 was a good example of an episode in which broad shifts in perceived credit risk affected market rates that were usually virtually risk free. The interest rate on reserves, by contrast, allows us to conduct monetary policy by managing a clearly risk-free overnight rate whose interpretation is unobscured by changes in the creditworthiness of market participants.

Just a word about governance. I agree with Vice Chairman Dudley. The one drawback you might see to a purely administered rate regime that depends on the interest rate on excess reserves is the awkwardness of the IOER rate being set by the Board of Governors and not the FOMC. But, similarly to the way we've handled the discount window rate since 2003, I think a solid commitment by the Board to follow the lead of the FOMC should suffice. And you could always pursue legislation, but I hesitate to recommend that.

A simple floor mechanism would allow us to control a risk-free short-term interest rate with essentially no routine Federal Reserve credit extension—that is, no standing lending facility. It would represent essentially an agnostic stance with regard to balance sheet policies and lending programs. In contrast, some other regimes may require a standing lending facility to establish a ceiling, perhaps a soft one, on targeted market rates, although I would argue that in the pre-crisis regime, the discount rate played virtually no material role in controlling the market

interest rates we cared about, such as one-year borrowing rates. So, for me, it's not obvious that it was integrated in any meaningful sense. It was there, and I'm not sure what a discount rate that hadn't been integrated would look like. It seems like it would look pretty much the same as the one we had. So it seems to me as if it's sort of tangential to interest rate control for our purposes.

More broadly, a parsimonious regime would allow us to cleanly separate decisions about our monetary policy interest rate and how we control that from decisions about other potential uses of our balance sheet, such as purchasing assets to compress yield spreads or intervening in credit markets in response to either market developments or institution-specific risks. In a parsimonious regime, our decisions about such programs would be unencumbered by fear of interfering with our control of risk-free short-term interest rate. The benefit of separating decisions about balance sheet programs and credit market intervention from our interest rate targeting mechanism stems from the fact that there are really distinct considerations that are involved for each. For one, interest rate control is aimed at macroeconomic objectives, and credit market interventions are presumably aimed at microeconomic objectives.

I think one clear lesson arising from the crisis is that credit programs are clearly more politically controversial than interest rate setting. Credit market programs have distributional effects that seem different in nature from the distributional effects associated with changing our interest-rate target. The latter have differential effects on borrowers and savers, which have come to be widely regarded as unavoidable consequences of the central bank's core monetary policy role. The former, the distributional effects of credit market programs, have differential effects on different classes of borrowers. They're less familiar to the public and are inessential to the control of risk-free interest rates.

Setting aside political considerations, assessments of the economic effects of interest rate setting and credit programs are on far different footings as well. There's an enormous research literature on central bank interest rate policy. The efficacy of central bank credit market interventions is another matter entirely, and I think it's quite fair to say that the subject can hardly be regarded as settled. Most of you know I'm not a big fan of central bank lending, but this isn't the time and place to rehash that. I certainly understand that many people came away from the crisis with strongly held beliefs about the utility of central bank credit market intervention, but this Committee has never really discussed a comprehensive retrospective assessment of cost and benefits. This area is likely to be the subject of a great deal of additional research in coming decades. In the meantime, we can avoid having to take a stand by choosing a parsimonious mechanism for controlling interest rates and leaving as a separate matter the fascinating debate about other uses of our balance sheet. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Lockhart.

MR. LOCKHART. Thank you, Madam Chair. Let me add my thanks to the staff for the excellent suite of memos and the presentation we just heard, which was helpful and very clear. In approaching the subject of the implementation framework for policy in the long run, my first reaction to the questions was to limit comments to purely practical considerations under the assumption that the balance sheet will likely be large—that is, on the flat part of the demand curve—for quite some time. I am a little skeptical about constructing a long-term framework that's disconnected from the feasible time horizon for its implementation. If this time horizon is long, our implementation practices are likely to become institutionalized and impractical to abandon. Options that might seem easy to implement in the abstract could be more difficult and costly in reality. Ease of transition may be a consideration in designing a long-term framework.

In later discussions down the road, the Committee may want to engage the question of the transition path. Nonetheless, the more my team and I worked through the memos and questions, the more I saw some value in laying out tentative thoughts on an idealized framework, even if short-term considerations could make its implementation elusive.

In thinking about such a framework, I am inclined to narrow the options to just those that focus on an unsecured interbank funding rate. Although I can see some merit in expanding the focus to the broader market represented by the secured rate option, I think issues like volatility argue for sticking closer to the *status quo*.

In an ideal situation, I lean toward operating with the quantity of reserves at or near a point on the flat part of the demand curve in which the volume of reserves is smallest and the balance sheet is, accordingly, as small as possible. I am inclined to avoid operating at positions on the curve with more reserve scarcity because of the concern about payment systems efficiency. I also prefer to operate in the area on the curve of smallest balance sheet consistent with ample reserves—that is, the flat region—for reasons related to the concerns of financial stability and the functioning of short-term funding markets. As a safeguard of global liquidity in various states of the world, I think the Federal Reserve should hold as small a fraction of outstanding safe assets as feasible. One other reason to operate with the smallest possible balance sheet, consistent with being in the flat region of the curve, is mitigation of political economy concerns that could arise with sizable payments to financial institutions.

Conditions associated with the balance sheet setting I've described are likely to make an active federal funds market less viable, so I envision moving in the direction of the OBFR as the policy target. A framework that stays on the flat part of the curve would necessarily involve the IOER rate as an implementation tool. With the OBFR as the policy target, it makes sense to me

to maintain an ongoing overnight reverse repo facility with the aim of enhancing monetary control by providing a deposit facility for a wider set of participants in short-term money markets, including the Eurodollar market. An ongoing ON RRP facility would serve as a complement or even a replacement, in time, for the IOER rate.

Regarding balance sheet composition at my preferred position on the demand curve, I envision a relatively neutral asset side of the balance sheet. By “neutral,” I mean holdings are distributed across maturities in rough apportionment to outstanding issues. And in my idealized framework, I prefer an asset portfolio in steady state being close to composed exclusively of Treasury securities, as that avoids any credit allocation. That said, I could see maintaining a small MBS operation as a form of contingency readiness.

One final thought: Some of the options we are considering include elements in conflict with our earlier public positions. I think it’s advisable for the Committee to consider when and how to indicate any shift in thinking about these previous positions presented in the September 2014 normalization principles as well as public statements on the overnight reverse repo facility. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Williams.

MR. WILLIAMS. Thank you, Madam Chair. I, too, found the briefings and the memos very valuable. However, I have a somewhat different take on where we are on these issues. I noticed that in the briefing it was described as the “long-run monetary policy implementation framework,” and that was the task that you were assigned and carried out. I actually think we need to be thinking much more seriously about the long-run monetary policy framework itself, and this ties into a lot of the comments that David López-Salido made in his presentation.

I'm going to focus primarily on macro stabilization and macroeconomic objectives, and my main concern, as always, is how are we going to conduct monetary policy successfully, achieving our inflation goal and our macroeconomic goals, in a world of a very low r^* ? I'll note the staff's view today is that the equilibrium nominal funds rate is $2\frac{3}{4}$ percent. I agree with that. If you look at the recent research that Kathryn Holston, Thomas Laubach, and I have done, and at research by economists at central banks around the world using similar methods, many people are finding that r^* is much lower today than in the past in many countries. And it's a global phenomenon.

This brings me to concerns about our monetary policy framework. First, if you think about our balance sheet of more than \$4 trillion and the massive QE in other countries, that is presumably adding, at least according to our models and our analysis, quite a bit of stimulus to the U.S. economy and to the global economy more generally. If you look at the methods for actually estimating r^* , whether it is the model with Thomas and Kathryn or models, such as those developed at the Richmond Federal Reserve, DSGE models, and others, they generally do not take into account the effects of QE on demand. It's just part of where the IS curve is, if you will. Then, if you actually think about going from massive QE stimulus in the United States and around the world and taking that away, going back to the baseline, you're talking about reducing a significant amount of stimulus in the global economy and the U.S. economy in particular, which arguably, using the methodology either of the work of my work with Thomas or other people's work or DSGE models or whatever, generally would imply that r^* will be lower in the future, not where it is today.

I am really picking up on what David López-Salido said. He described it the opposite way; a large balance sheet will boost r^* . But if you actually look at how the methodology of

these research papers work, because they don't take into account the balance sheet generally, it actually is arguing that that boost to r^* is already built into our estimate. So I would argue that there is up to $\frac{1}{2}$ percentage point lower r^* out there once we take away QE in the United States, and more generally globally, which would argue a nominal neutral federal funds rate maybe of 2 or $2\frac{1}{4}$ percent or so. And that does bring a huge challenge to carrying out monetary policy. If we keep the balance sheet elevated to keep r^* higher, like David López-Salido said, we don't have as much room to use QE to stimulate. If you look at the very nice paper by Dave Reifschneider a few months ago, it does point out, if we can get our balance sheet back down and if r^* isn't lower, we actually have a lot of room for stimulus. But in my interpretation, I fear that there's not nearly as much room for stimulus. There are limits to how far QE can go in terms of the assets that we can buy under current law and the amount of outstanding MBS.

These considerations make me think that, really, we need to be seriously discussing the monetary policy framework. And we should be focusing our discussions and our decisionmaking on that framework, meaning what our inflation target should be and whether we should be thinking about price-level or nominal GDP targeting or other approaches to overcome the effective lower bound. And from that will flow naturally some of the decisions about what's the right size of the balance sheet, what's the right policy framework.

From my point of view, I agree with the Chair that we are not in a rush to make these decisions about what I think of as mostly tactical aspects of the operational sides of monetary policy. I think instead we should not be making public statements about what our operational or implementation side of our framework would be until we really have thought through some of these longer-run issues in connection with what our objectives and our actual monetary policy framework itself should be. Thank you.

CHAIR YELLEN. Thank you. President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. My comments actually follow very closely those of President Williams. I would say there does seem to be a surprising amount of consensus when the Presidents to my right and left actually agree on being on the flat part of the demand curve. [Laughter]. There does seem to be somewhat of an emerging consensus.

There was an awful lot of material. The staff did a fantastic job pulling it all together. I'm going to deal with only part of that, because I'm trying to keep my comments parsimonious. [Laughter] Let me start by focusing on the balance sheet and make some conditioning assumptions. I assume that if and when we again hit the effective lower bound, tools other than negative interest rates will be our first line of defense. I make this assumption for three reasons. First, I view the results arising from the experience of other nations as quite mixed. Second, I do not believe that currency will be eliminated or retail deposits will stop being sticky at a zero rate. Third, these regimes disproportionately affect banks, which in turn affect monetary policy transmission and financial stability, often in perverse ways. I also make the assumption that in the near term, this Committee will not be willing to raise the inflation target, even though I personally think we set the inflation target too low. Finally, I take as given that the short-term equilibrium interest rate will remain lower than it has been historically.

In a world with low equilibrium interest rates, it is worth revisiting how frequently short-term rates are likely to hit zero and how long they may stay there. The business cycle is unlikely to have been tamed. If we look at the Tealbook and private forecasters' assessments of the probability of a recession in the next few years, it would be risky to assume that no recession occurs over that horizon. Thus, it is reasonably likely that even if we were to shrink the balance sheet relatively soon, the next recession could easily occur before the current surplus of excess

reserves is fully removed. With a low real interest rate and a low 2 percent inflation target, we will not have much room to lower short-term rates.

This may well cause us to, once again, hit zero short-term rates and to need alternative monetary policies to stimulate the economy, most likely by engaging in large-scale asset purchases to lower longer-term rates and rates other than on Treasury securities. Thus, if my assumptions are right, I think it is, at the least, prudent risk management to assume that large-scale asset purchases, in conjunction with hitting zero for short-term rates, will be our standard recession-fighting tools. Thus, I see the balance sheet varying but with high average excess reserves that grow during recessions and recede during recoveries. If we are quite likely to have a large balance sheet, then our operating framework should make clear and seek to optimize policy in a framework that acknowledges that we will be operating in a world of large excess reserves.

What factors other than the business cycle should be considered in determining the size and composition of the balance sheet? I would continue to hold some long-term Treasury securities and mortgage-backed securities, the latter in order to maintain operational expertise in preparation for economic downturns, when we may resume large purchases or sales. Also, we have successfully used the size, composition, and duration of the balance sheet to support the economy during recessions. Some of the staff memos point out that such purchases may have smaller effects during expansions, in part because they will not be helping to improve market function. But there is no reason to believe that these factors can affect the economy only during economic downturns or only in one direction. Thus, I would maintain sufficient balance sheet compositional mix and duration to address both macroeconomic stabilization and financial

stability concerns. However, to signal or influence these concerns, we would need to continue to hold MBS and long-duration securities in our portfolio.

I would prefer to have a broader discussion on rates once we have more clarity on the balance sheet strategy. My current thinking is to communicate policy primarily through the administered rate that we control. Because the only administered rate controlled by the FOMC is the overnight RRP rate, I would focus on that rate as a floor unless the interest rate on excess reserves at some point in the future becomes a tool of the FOMC. My own view is that we closely monitor short-term rates but not necessarily target them.

I would postpone the discussion of liquidity facilities. I think we should make decisions about the balance sheet first. In particular, what are the size, composition, and duration of our balance sheet going to be should we experience a long period of recovery, knowing that in a recession the size, duration, and composition of the balance sheet will likely be altered by the severity and nature of that recession? How we need to think about liquidity facilities depends on the decisions that we make about the balance sheet during good times. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Powell.

MR. POWELL. Thank you, Madam Chair. I'll go through the three sets of questions expeditiously, if not parsimoniously. The first set of questions asked for views on the key design elements, and I would want to start with a rate that's highly robust and likely to remain so over time. Although our current system is working at the moment, I think that for the longer term, the federal funds rate is unlikely to meet that test. There are a couple of near-term problems with the arbitrage trade that represents nearly all of the current activity in the federal funds market. First, the spread between the IOER rate and the federal funds rate generates criticism that it's

subsidizing banks, mainly large foreign banks. Second, the arbitrage trade is vulnerable and could easily disappear, thanks to potential market concerns about European banks, or, for that matter, the banks themselves could pull back if regulatory changes make a trade unprofitable. If the federal funds rate does become idiosyncratic or goes away entirely, we'll be left without a viable policy rate as well as with \$11 trillion or \$12 trillion of OIS swaps that are priced off the federal funds rate. The plan developed in our work with the alternative reference rate committee is to move new OIS trading to either a GC repo rate or the overnight bank funding rate, depending on which rate that committee picks, we expect, in early 2017. For existing OIS trades, we will then work with the industry and with ISDA to get the chosen rate into swap agreements as a backup in case federal funds fails. But the fact that we're even talking about this says nothing good about the quality of federal funds as a benchmark. Bottom line: I would be inclined to look for a more robust alternative.

Of the two possible administered rates, either of them could make sense to me. The IOER rate could work particularly, I think, in a narrower spread to overnight RRP, which probably means a larger RRP. And I agree with others that the governance issues there could easily be managed. We could also pick the overnight repo rate if that facility is to be with us for the longer term, a possibility that is more real to me now in a lower-for-longer world. As for market rates, the overnight bank funding rate is a plausible alternative, although OBFR transaction volumes have fallen by roughly half this year, thanks to money market reform, and, as I think Antoine indicated, it would probably be necessary to broaden the scope of that rate.

The most robust rate—and I guess this makes me a case 3 person—and most relevant as a source of funding could well be a GC Treasury repo rate, depending on whether it's triparty or includes bilateral transactions. The size of the underlying market could run anywhere from

\$300 billion to \$700 billion or more per day, and unlike the markets associated with the unsecured overnight rates, the repo market is and is likely to remain an important source of funding for a wide set of financial institutions. Of course, if we do target a repo rate, it would make sense to deal with an expanded set of counterparties that are active in the market, and I'm fine with an operating framework that recognizes that we're no longer mainly dependent on banks for financial intermediation.

The memo asks next whether we would prefer to operate on the flat or steep part of the demand curve for reserves, and I'm well aligned with essentially all that's been said on this. We face both a larger balance sheet and interest rates that will be well below historical norms for the foreseeable future, and this reality has important implications for the operating framework. I do lean toward a world of plentiful reserves, but one that is no larger than it needs to be. But, regardless of what one might see as the ideal end state, the long-run framework, I believe, should assume that we're going to be operating indefinitely in a world of plentiful reserves.

I frankly think that the Tealbook balance sheet projections—I understand how they're derived and appropriately derived from the mechanical interest rate rule and assumptions based on what the Committee has said—are out of touch with market expectations as well as the latest SEP numbers. The surveys of the primary dealers and market participants that came out last week suggest that reinvestments will continue in full until April 2018 and estimate that the SOMA will be at \$3 trillion at year-end 2019, unless there's a return to the effective lower bound, in which case the SOMA will have increased to \$4.9 trillion.

Of course, in the Tealbook we achieve equilibrium and there are no recessions—again, a perfectly natural assumption—but there will be a recession, and if one happens, think about this for a second: If you just roll over the probability of recession for a few years, there's roughly a

two-out-of-three chance that there will be a recession in the next four years. The SEP says that we'll start from a low level of rates. We'll go back to the effective lower bound. I strongly suspect that we'll be there for an extended stay and ultimately resort to another LSAP, and then we'll be very cautious about liftoff and move gradually in raising rates.

If you add all that up, what you get is a balance sheet that is probably just about as likely to grow as to shrink in the years ahead. That is not a world that I embrace or want. But it just seems to me that is the likely world in which we live. So reserves are likely to remain abundant, even allowing for some uncertainty with respect to the level at which they would become scarce.

Now, I think that does suggest that the overnight RRP will need to be more long lasting than I had anticipated, and I'm inclined to consider that. So far, it has provided an effective floor and done so without distorting markets. I think we will need a dynamic cap on the facility if it's going to be around for longer, and I also think we should consider narrowing the corridor between the IOER rate and the overnight RRP rate in order to address that perception of subsidization.

The second set of questions, more briefly, relates to the possible alternative liquidity arrangements that could mitigate stigma and create a ceiling, and let me say I'm open to any changes that would help lower the stigma of borrowing from the central bank. It isn't clear to me that the suggestions in the staff memos could accomplish that, because it's hard to avoid stigma when you're borrowing at a penalty rate. But I encourage that these ideas receive more examination and analysis. I also think it may be worth considering the idea of price liquidity along lines similar to what the Reserve Bank of Australia does. The idea would be to require U.S. banks to pay ex ante for discount window access, and then because they paid for it, they

ought to be able to use it without stigma. I'm sure there are problems and holes with that, but it's another idea that I'm sure we have considered and should continue to do so.

In the meantime, I don't see it as particularly necessary to have a solid ceiling if we're in a floor system. I think that's less of a consideration, and we didn't particularly, I think, as others have pointed out, have a hard ceiling in our previous regime.

The third set of questions relates to the long-run size and composition of the balance sheet. I strongly prefer that we use LSAPs only at the effective lower bound. I think we've learned that it's easier to grow a big balance sheet than it is to return to normal size. So I would use LSAPs only when conventional policy is exhausted. I am open to the idea that a larger balance sheet could have some financial-stability benefits, but these are relatively new ideas, and as David López-Salido said, this is a new and fascinating literature and small literature that has not reached a real consensus. So I think it's premature to get close to embracing anything like that.

As I've mentioned, in any case, I think we're going to have a larger balance sheet. I am open to the idea of continuing to hold a residual amount of MBS for the reasons that President Lockhart suggested—in other words, only to maintain a certain amount of expertise. It's not something I feel strongly about. And I'm not attracted to the idea of intervening to manipulate the shape of the yield curve for financial-stability reasons.

Finally, I would look at the idea of gradually shortening the duration of the portfolio mainly to diminish our effect on fiscal outcomes. I do realize this is a form of tightening, and I would look at it longer term, and I would want to do it gradually and in consideration of the fact that it is a form of tightening. And with that, I'm done. Thank you.

CHAIR YELLEN. Thank you. President Evans.

MR. EVANS. Thank you, Madam Chair. I have a set of relatively small and idiosyncratic comments. I'm going to deliver them anyway. [Laughter] I will say they feel smaller after hearing President Williams's and President Rosengren's comments. I think they really hit on a very important issue. I think President Williams is right. It's very important to assess our monetary policy framework if we're expected to be in a low- r^* environment. Both President Rosengren and President Williams pointed to the fact that, in our present position, there's not a lot of room to reduce short-term policy rates, and that's going to be the case even if we get it up somewhat. So compared with our past experience, I think that's likely to continue to be a problem. I know it's not popular, but having a discussion about whether or not we have the right inflation objective or some other price level targeting regime would be very useful, especially in view of where we are with the long-run framework.

Back to the idiosyncratic comments. Thanks to everyone involved in producing these insightful analyses and memos. My staff and I had a good dialogue that challenged my understanding and preferences regarding possible future policy frameworks. In particular, the memos clarified a number of operational issues related to our monetary framework, and I found this useful. However, most of my comments today will reflect either a curmudgeonly nostalgia [laughter] for our previous operational framework or concerns about strategic risks that would come with a big change in our operating regime. The memos touched on many of these questions as well.

First, the operational issues. I previously expressed sympathy for a framework with a smaller balance sheet and scarce reserves so that we can go back to targeting the market rate in a sufficiently well-ordered federal funds market. Such plans seem consistent with the Committee's June 2011 exit principles as well as their update in September 2014. Back then, the

Committee indicated that when increases in policy rates are well under way, we will cease reinvesting maturing securities and let the balance sheet gradually shrink. Many observers likely have assumed that this would lead to reserves becoming scarce and the funds rate tightening relative to the IOER rate. If this occurred, we'd be back to something similar to our previous operating system.

But the long-run framework analysis suggests it's quite possible that a robust federal funds market may not reemerge even if we return to a scarce reserves environment. One reason is that some elements of the post-crisis regulatory environment appropriately favor secured or term funding to meet the liquidity coverage ratio. As a result, depositories seem likely to rely less on unsecured overnight borrowing on the federal funds market to meet reserve requirements, and without a vibrant market, it may not be desirable to target the federal funds rate.

If it's impractical or undesirable to return to a tightly controlled target for the federal funds rate or the overnight bank funding rate, then it seems like we are led to using the IOER rate or an overnight secured rate like the Treasury repo rate as our formal policy target. I understand the arguments in favor of running such a system with a large balance sheet, and I can appreciate that operating on the flat part of the reserves demand curve is appealing from the point of view of interest rate control. I spent a good deal of time with my staff discussing something close to the third illustrative framework, an operating regime in which the target was a range for the repo rate and which included IOER, a large balance sheet, and a floor and ceiling facilities.

While I won't say that this is my preferred outcome, mulling over this regime highlighted a number of general framework issues for me. For example, our paramount aim is to pick a target rate that we can hit accurately as well as one that is a root pricing kernel for the interest rates that determine the degree of accommodation or restraint in the real economy. From a

technical market standpoint, I see that targeting a repo rate and working with a broad set of counterparties has some appeal. But I wonder whether such a choice also could have implications for financial markets beyond basic monetary policy control.

So I think there are benefits arising from better understanding the scale and composition of the financial market activities that we would be encouraging under these frameworks. For example, would our actions inadvertently change risk spreads in a way that might not be socially optimal? If our actions change risk spreads, we have to ask whether such changes in our framework are necessary for us to achieve our policy transmission goals, and if they are, whether we can communicate them in a way that the public would not perceive as simply promoting the interests of Wall Street.

Herein lies one of my main concerns, and perhaps this is just the nostalgia I mentioned at the outset for a simpler, smaller operating system, nostalgia for a system in which banks, both large and small, can see the way monetary policy interacts with them by a familiar and transparent federal funds market. I think the memos plausibly describe how we will achieve monetary policy control with our operating procedure targets, something like a Treasury repo rate and a floor system with IOER. Dealers and large and small banks will all see their funding conditions tightening or easing together as we alter our policy rates. So technically it all should work, but I worry that shifting the public focus of policy from well-known interactions with depositories to rates in the repo market might be seen as primarily benefiting Wall Street with no material benefit to Main Street. This would be a perception problem. A long U.S. history of criticizing central banks centers precisely on issues like this. Go back to the founding of the Federal Reserve and remember the contentious issues related to city versus country banks, as recounted in Friedman and Schwartz.

Admittedly, even in the pre-crisis period, explaining monetary policy transmission was not an easy task. Still, the required reserve constraint that banks faced was relatively easy to describe to the public. In contrast, the Treasury repo rate transmission mechanism might conjure up to the naïve, like myself, visions of subsidies to Wall Street or meddling with capital market pricing adjustments.

Finally, I worry about the political economy risks to our independence if we run a large balance sheet. Fiscal authorities have proven adept at discovering new pots of funding that do not obviously disadvantage their constituents the way that higher taxes do. Even when the balance sheet was smaller, the Federal Reserve was sometimes used as a piggybank to finance expenditures. A scarce reserve system is not a panacea, but surely the risk is higher under a large balance sheet.

To sum up, I'm coming around to the idea that the future might look more like the present. However, I think my fonder memories of our old operating framework are more than simply curmudgeonly nostalgia. My misgivings underscore some risks that we may need to better understand and assess. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Bullard.

MR. BULLARD. Thank you, Madam Chair. Let me thank the staff for these valuable summaries of key issues facing the Committee. I know a lot of work went into this, and I think this is going to provide fodder for thought for the Committee for a long time. I have a broad comment, and then I'm going to get to more specific comments. I think my broad comment is consistent with what many around the table are saying, but perhaps my statement will be a bit stronger.

Normalization, as originally conceived by this Committee, is not proceeding as planned. The pace at which we are going, which is about one 25 basis point increase per year, is almost imperceptibly slow. The balance sheet is unlikely to decline via ceasing reinvestment any time soon. I think it would be better for the Committee to state that we are not thinking in terms of a normalization program and that we instead think that the current level of the policy rate and the current size of the balance sheet are approximately correct, in light of the macroeconomic situation prevailing today and likely to prevail over the forecast horizon.

In my view, this makes many of the issues addressed in the long-run framework project somewhat less urgent, as it appears that it may be many years before we are in a policy situation that is meaningfully different from the one that exists today. And in this I agree with Governor Powell's assessment just a moment ago and those of many others around the table. At a minimum, I think that these issues would need to be discussed in detail when we are closer to a decision point on how we want to deviate from what we're doing currently. That said, I'll now turn to some brief comments centered on the questions posed to the Committee.

Regarding the first question, the so-called key design elements, I have a mild preference for a floor system with no reserve requirements and in which we use the overnight reverse repo rate as the policy rate. I would prefer no gap between the overnight reverse repo rate and the IOER rate—the so-called no subsidies condition.

Concerning liquidity provision, the second question, I prefer to leave the discount window operations as they are. I would be willing to consider a continually operational TAF with periodic testing, which could then be more fully utilized in the event of severe financial stress.

Finally, considering asset purchases as a policy tool for the future, I think it is a reality that asset purchases are the Committee's most effective tool once the zero bound has been reached and are likely to be implemented by the Committee should we return to recession in the years ahead. However, because this is a discussion about the FOMC's long-run policy framework, we may want to put more weight on three possibilities that could provide partial substitutes for asset purchases: number one, price-level targeting; number two, nominal GDP targeting; and number three, targeting long-term interest rates more directly. It seems to me that the future of the Committee probably lies in one of these directions more than in the asset purchase direction, or at least as much probability should be assigned to these possibilities as to extensive use of asset purchases over the next decade or so, let's say.

Now, if I turn back to limiting the discussion just to the balance sheet question, I have three further comments. Number one, I think we should turn to asset purchases only after the effective lower bound has been reached, as several here have said. I would rank asset purchases well ahead of a negative nominal interest rate policy in terms of likely effectiveness. Number two, concerning the balance sheet as a financial-stability tool, as the staff suggested, I think this deserves further study. I found former Governor Stein's comments at the Jackson Hole symposium interesting, but the topic requires additional research. And, finally, on the long-run composition of the balance sheet, I would like to go with all Treasury securities, with an average duration under five years. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Harker.

MR. HARKER. Thank you, Madam Chair. I'd also like to thank the team for some great work. You provided a real wealth of information that was very thought-provoking, so I want to thank you.

In my thinking, we can start making some progress by first identifying some design aspects that appear desirable across a wide range of frameworks and, thus, once selected, would not constrain our choices in the future. Second, I would like to pose some questions and offer some thoughts on the higher-level issues. Progress on these issues has the potential to drive the design of much of the long-run framework and, thus, substantially narrow our choices. In doing that, I will comment on the questions posed by Thomas and Simon's memo.

What are the possible aspects of the framework that are desirable pretty much independently over the overall design and that could occur sooner rather than later, not waiting for the full implementation of a long-run framework? Some of these have already been mentioned. In my view, it seems desirable to get rid of remaining reserve requirements. They are outdated, impose a costly burden on both banks and us, and foster avoidance practices. Reserve requirements may only be essential in a corridor system with a very small balance sheet such as we employed before the crisis, and I don't envision returning to that system any time soon.

Second, I think that the memo's discussion of alternative arrangements for liquidity provision belongs in this category. We should better delineate the goals of interest rate control and liquidity provision, both broad and idiosyncratic, into separate facilities. In terms of establishing a ceiling on rates, whether one prefers a deposit institution repo facility or the financial institution repo facility, may depend on the overall framework. But in any case, a separate facility designed exclusively for interest-rate control would potentially avoid stigmatizing borrowing. Similarly, as others have said, I view the TAF as the best way to provide broad liquidity, as it avoids stigma, and it should be kept operationally ready for

situations deemed appropriate by the Committee. Further, the discount window should be used exclusively for those idiosyncratic liquidity needs.

Finally, as others have mentioned, I think it's important that we're ready to move away from the federal funds rate to the overnight bank funding rate, the OBFR, because we may actually find ourselves with no choice but to do so. The federal funds market is basically one change in business practices, either by the Federal Home Loan Banks or foreign banks, from pretty much disappearing. We should continue the effort spearheaded by the New York Federal Reserve to expand data coverage to onshore deposits, which would facilitate communication and avoid the perception that the Eurodollar market is a foreign market. In contrast, I am particularly uncomfortable with the general level of rates option. It may be difficult to achieve, as various rates can diverge from time to time, and communicating why a particularly weighted composite average is good policy would not be easy, as I don't think we have any idea what those weights should be.

Let me now delve into some of the higher-level questions and some tentative answers that could help drive many of the operational choices we face. An important question is whether we should actively use the balance sheet for financial stability concerns in normal times. If so, then many aspects of the operating regime will be subservient to financial-stability issues. For example, decisions on how much public money-like assets should be provided would basically determine the size of the balance sheet, and concerns over maturity transformation would affect this composition in terms of maturity.

I think, as the staff emphasized, we know very little about how the size and composition of our balance sheet affects financial stability. Furthermore, providing for an allocation of government liabilities with a particular term structure would require coordination with the

Treasury, which I find to be problematic. Similarly, I would also avoid buying MBS or other credit market assets, as doing so distorts asset allocation and opens up the door to political pressures for supporting various borrowers and lenders at the expense of others.

More generally, I would not be in favor of the balance sheet being an instrument in normal times. Coordinating both tools would pose challenges, and it would be difficult to communicate the exact reasoning for any policy mix, because, theoretically and empirically, we don't know with enough certainty what the effects of the balance-sheet changes will be.

Another issue that others have discussed surrounds the use of negative interest rates as opposed to LSAPs as the primary alternative tool for additional policy accommodation at the effective lower bound. If we view negative rates as our first line of defense at the lower bound, then the operating regime must be ready for them. I am not a big fan of negative interest rates. They may send alarming signals, could be politically unpalatable, and are potentially damaging to commercial banks' balance sheets. When necessary, I would much rather resort to asset purchases, but that implies that we must be willing to unwind past LSAPs as part of the normalization process or we could end up with an excessively large balance sheet, with negative remittances and their associated political risk becoming increasingly likely.

Another central question for me is the use of voluntary reserve targets. Theoretically, they appear attractive because they can be used at any desired level of the balance sheet, expanding our choices while providing for an active interbank market. An active interbank market would allow us to return to money market conditions—maybe I am a curmudgeon, too, President Evans—that prevailed before the crisis and still allow for fairly precise control over short-term rates. In the language of the memo, we would be able to operate on the steep part of the demand for reserves at the level of our choice. VRT would, thus, also put policy on familiar

grounds and separate considerations of balance sheet size from interest rate adjustments. But—and I emphasize “but”—there are issues concerning whether the VRT chosen by the banks will always be consistent with our desired level of reserves. It is not totally clear whether the Desk will need to perform large and frequent open market operations for the funds rate to be consistent with the desired target. The extent to which this had the potential to cause problems will depend on the degree of interest-rate volatility we are prepared to accept. Thus, VRT is not “ready for prime time,” but I do think it’s worth further study.

My final big-picture issue is whether actively targeting a repo rate is really a viable alternative to targeting the OBFR. Such a move would potentially have large implications for the operating regime and balance sheet size. Although the memo circulated made a good start on this complex topic, I don’t consider this a viable option at present. Basically, I don’t think we possess a deep enough understanding of the changing regulatory environment and the market structure effects of a permanent Federal Reserve presence in the repo market to proceed confidently at this moment. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Madam Chair, and thank you to the working group for this great work. Let me mention three aspects of discussions I have had with my team as we wrestled through some of these issues.

The number one issue we talked about was how hard it is to discuss these issues separately from talking about the realities of monetary policy. In particular, and to return to what President Williams talked about on r^* , our view is that unless there are fiscal policy structural reforms, infrastructure spending, or other actions, r^* , all things being equal, is going to be low

for an extended period of time. If that's going to be the reality, it's harder to have this discussion.

Assuming there are other economic policy actions that help improve prospective economic growth rates and, therefore, give us more operating maneuverability, my team and I totally agree with an objective to operate on the flat part of the demand curve for reserves, with a balance sheet ideally smaller than the one we have today—and I might even go so far as to say as small as possible, but certainly smaller than the one we have today—with the Federal Reserve owning as small a percentage of safe assets as is feasible. Like others, I'm much more comfortable with our owning Treasury securities than MBS. The Treasury market is a big liquid market, and the Federal Reserve owning sizable portions of Treasury securities is unlikely to affect the dynamics of that market materially. My concern is that we could have a big effect, and we probably already are, in the MBS market. So while we may have some minimum working level of MBS, I'd prefer to keep it as small as possible. With those objectives, we also came to the view that an administrative rate or the OBFR might make more sense as a target than the federal funds rate. And, clearly, we would need to employ other tools, such as the IOER rate.

The biggest issue we wrestled with, though, is—I guess I've learned a new acronym, PE—the effect on the political economy. In particular, we debated extensively the need for the Federal Reserve to be independent and the importance to this country of a strong, independent central bank. My concern is that if the Fed's balance sheet stays large and there's a prospect of it getting larger, certainly away from a crisis, we are likely to induce accusations that the Federal Reserve has overstepped its bounds, which I fear will reduce our scope to act in a crisis when action is actually needed. I think a large balance sheet, or a sizable balance sheet, is probably going to be accompanied by calls for review of our communication practices, transparency, and

how we deal with our various constituencies. So all things being equal, I, for one, would like to see us take every opportunity to reduce the size of the balance sheet, and I'm very leery of alternatives that would call for a larger balance sheet, for fear that it might ultimately reduce our independence and our ability to act when there is a crisis. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Tarullo.

MR. TARULLO. Thank you, Madam Chair. I'd like to associate myself with the perspective introduced by Presidents Rosengren and Williams and echoed, at least briefly, by Presidents Evans and Kaplan. That is to say, I think the most important thing for us to be focusing on now is, as President Williams said, not necessarily the implementation framework but the framework. President Williams's point, which he made today and has made in his paper, is that in a world of low r^* , one needs to think about what your monetary policy framework is and consider alternatives that heretofore haven't been particularly attractive to people. I think what President Rosengren did in complementing President Williams's approach was basically to ask us to hypothesize that some external event causes a recession in the relatively near term and ask how we would respond. Those are somewhat distinct things to ask about, but I think they fit together. And, indeed, those concerns have informed my position on meeting-to-meeting monetary policy, that is, my concern that we have relatively few tools to deploy—or at least attractive tools to deploy—in the event that we were to get a recession. So I very much agree with them and with President Williams's point that a lot of the implementation issues will, if not fall easily out of that analysis, be a little bit more obvious and the choices perhaps a bit more circumscribed.

I might note, in that regard, that I thought Rob framed it exactly right. We can hope that other things happen—that there's fiscal stimulus, that there's structural reform—but we can't

count on it, and so we need to be thinking about options. And a related point is, it's not enough to say, "Oh, gee, there are downsides to some of the options that are out there." Well, yes, negative interest rates have downsides. A higher inflation rate has a downside. Nominal interest rate targeting has a downside. But so, too, as many people have pointed out, does further growth of the balance sheet have a downside, and it might not even be particularly efficacious if the slope of the yield curve hasn't risen very much. Another LSAP may well not even do the trick were we to take on some of the additional political vulnerability. So I just want to reinforce the most important point to focus on.

As a corollary, I will say I wouldn't dismiss all of the balance sheet issues out of hand—even though I agree with those who have said that it's sort of provisional and we don't really know about the effects—precisely because of my first point, which is we just don't know what kind of tools we're going to have and what the downsides of those tools are going to be. I think looking at some of the issues associated with maintaining a larger balance sheet or at whether there would be utility in having different durations on the balance sheet and buying and selling those is very much worth consideration, precisely because we might find ourselves constrained in our overall monetary policy and have to use a tool that does have some costs but whose benefits might be more important.

I do have one quite discrete suggestion, though, in the context of the particular memos that the staff has done. There was a passing reference in one of the memos to the possibility of changing the qualifications for those who participate in the ON RRP program, and some of you may recall that my concern at the outset of our institution of the ON RRP was the potential for counterparties using the Federal Reserve as a place to run from other short-term funding destinations when stress built up in the economy. I was particularly concerned about prime

money market funds doing that, yanking their CP from large banks and sticking it in the Federal Reserve at the first sign of stress. The SEC's reform package, coupled with the reaction of the industry and of investors, which was, I will say, greater than what I certainly had anticipated has provided an opportunity now, as prime funds are what, Simon? Down to about 200?

MR. POTTER. Institutional funds, 200.

MR. TARULLO. Yes, institutional prime down to about 200. So this may be an opportunity for us to narrow the formal qualifications for being a counterparty, for example, to a fund that invests only in government securities, but to do so in a fashion that doesn't have an enormous practical effect, because that's what most of the funds are now. I would hope that maybe we could pursue that a little bit in the shorter term, so that we don't lose the opportunity to do it, particularly if the prime funds have a bit of a resurrection over the next year or so if investors perhaps come back or spreads change or something of the sort.

The other thing I'd say is that neither of the issues that Vice Chairman Dudley raised at the end of his comments—that is, to make a change in the leverage ratio or regulatory requirement, or to be able to lend to broker-dealers—is within the authority of this Committee. So I don't feel the need to comment at length. But at least on the leverage ratio point, I did want to say I'm not quite sure I would have framed the issue the way Vice Chairman Dudley did. First, the whole purpose of a leverage ratio conceptually is not to focus on issues of risk. So the risk-free nature of reserves is not really relevant to the conceptualization of a leverage ratio as part of a complementary set of capital requirements. Second, although it is true that the banking system as a whole does not have the ability to affect the amount of reserves in the system, the activities and conduct of any particular bank do have an effect on the relative reserve holdings that it has, and there are regulatory benefits that come from having those reserves. So, in some

sense, as in many areas, this is a balancing that the banks need to engage in. But third, and maybe most importantly, it seems to me premature to draw any judgments on this right now not only because of the debate that's going on in this room today, but also because, not having implemented all of the risk-based reform requirements, we don't really yet have a good picture as to the degree to which the large banks that very much want a change in the leverage ratio will be scraping up against that in a way that we would regard as counterproductive. So it's obviously something that people are watching, but there are other ways to deal with a problem that may be established over the years other than the exclusion of one asset from the denominator. And that's sort of the way in which regulators, particularly those from noncentral banks, have leaned, even though central bankers sort of like the idea that their asset is the one that would get excluded. Finance ministries like the idea that their asset is the one that would get excluded. And you can see why, as a conceptual matter, academics have tended to say that's why you don't exclude anything. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President George.

MS. GEORGE. Thank you, Madam Chair. I, too, thank the staff for their work over the past year to bring the discussions we've had in July and today. I will also jump on the President Williams bandwagon, because as I looked at this material, I found the various tradeoffs left me thinking about what's the appropriate starting point for a framework, in view of the realities we face today. I think there are many ways we could go about it, as some have already suggested, but I thought about it in the context of the size of our balance sheet in the longer run as one approach. In light of the importance of this issue, it's worth certainly more discussion among this Committee to get a sense of where we're ultimately going.

As it relates to the questions the staff asked, I see the benefits of a leaner balance sheet. Political issues that arise with payment of interest on a large stock of reserves and credit allocation pose a number of risks that come with a very large balance sheet. In addition, if the equilibrium real rate remains low, a leaner balance sheet would give us more scope to use large-scale asset purchases if we are, again, at the lower bound, rather than expanding the balance sheet further into uncharted territory or contemplating negative policy rates.

Of course, transitioning to a leaner balance sheet poses its own challenges. While I understand this work is about the framework in the long run, it seems one part of the discussion that could be missing is talking about the costs and benefits of a possible transition to a leaner balance sheet. A lean balance sheet, however, does not need to resemble its pre-crisis composition. From this standpoint, I'm not sure we necessarily need to operate on the steep portion of the demand curve for reserves. If we remain on the flat portion, then it may make sense to consider an alternative policy rate, including the OBFR.

In this case, a reconsideration on the longer-run plans regarding the overnight RRP facility is also warranted. I could imagine a scenario with a leaner balance sheet, a standing ON RRP facility, and the OBFR as the target. The leaner balance sheet would provide a lower cap on the ON RRP facility, and that would give me more comfort if it were to be integrated into our framework on a more permanent basis. Of course, there would be significant changes that would require a communication to the public and a revisiting of the current normalization principles and plans.

In terms of the liquidity provision options, the tradeoffs between providing backstop lending, interest rate control, and moral hazard are not new ones. I think further analysis would be needed, and I'm interested in how separate facilities might support different liquidity needs in

the future. And as some have commented, I, too, believe that thinking about the TAF as a standing facility has some merit. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Mester.

MS. MESTER. Thank you, Madam Chair. I am going to add my two thumbs up to the Federal Reserve System staff for their efforts and insights. Obviously, it was a Herculean effort, and the memos that you provided are very useful in helping guide us through a lot of these issues. I think the memos make a fairly compelling case that a number of different long-run frameworks would allow us to implement monetary policy effectively with sufficient interest rate control and transmission to market rates. So the choices are dependent on our preferences about other issues, and a few of those issues loom large for me.

First, I would prefer that the Federal Reserve not have a large footprint across markets in normal times. Our design of the framework will affect financial market participants' behavior and the structure of financial markets. While the Federal Reserve should promote the orderly functioning of markets, we should not choose a framework that will lead us to displace private-sector financial markets. I don't think the Federal Reserve should be the main intermediary. We should be the lender of last resort, not first resort. For example, I believe if the Federal Reserve were to crowd out all private-sector maturity transformation with an aim of promoting financial stability, as discussed in the staff's balance-sheet memo, we might actually find ourselves with less financial stability, as firms wouldn't be taking actions to ensure they could obtain liquidity from the markets, nor would they have incentives to monitor one another.

Also, it's an open question as to what the efficient size of the financial sector is. If an excessive volume of private short-term Treasury security-like liabilities are being created in the market, we need to know more about why these assets are being demanded. It is not clear to me

that, if the Federal Reserve were always to meet the market's demand for such assets, we wouldn't be engendering inefficient expansion of the financial sector and encouraging more risk-taking, not less.

Associated with this, I lean toward frameworks that are less complex—I guess “parsimonious,” perhaps. Rather than a single structure that can handle all possible contingencies and that would be costly to maintain, I prefer a framework that would work fairly well in normal times but be nimble enough to be augmented by additional tools during times of market dysfunction and stress. I support the Desk's efforts to expand the number of counterparties with which we normally engage, but I don't think we should broadly expand all of the types of financial institutions with which we engage in normal times.

With the equilibrium interest rate expected to remain lower than it was before the crisis, the probability of returning to the effective lower bound on the policy rate has increased. We need to be operationally prepared to engage in asset purchases in these situations when we've reached the lower bound. But, in normal times, I prefer not using asset purchases as a standard tool of policy. We have less experience with this tool, and it isn't clear how to achieve appropriate coordination of the policy rate and asset purchases away from the lower bound. So I'd prefer the simpler approach: keeping asset purchases for extraordinary times.

Second, political economy issues loom large for me. I'd like to maintain the separation between the Federal Reserve and the Treasury to the extent we can. I believe that if we run policy with a large balance sheet, we have to acknowledge that we would more likely be subjecting ourselves to increased political pressures to take on a wider array of assets than I'd feel comfortable with. The Federal Reserve's long-standing desire to avoid allocating credit to particular market segments has served to protect the independence of monetary policy from

short-run political influence, and I believe this independence has served the public well. Our commitment to avoid this type of pressure would be to bring the asset composition of the balance sheet back to comprising solely Treasury securities. This is the goal stated in the Committee's published normalization principles.

An all-Treasuries portfolio is feasible in a corridor framework, but it isn't clear to me whether such a portfolio is feasible in a large-balance-sheet floor framework. The staff memo says there's uncertainty about the level of reserves at which the demand curve for reserves flattens out. It would be good to have some numerical estimates of the shape of this demand curve and how it might change with the level of interest rates. Banks currently hold \$2.3 trillion in reserves. What's the effective minimum size of reserves for our being able to run an effective floor system? And, in such a system, would the Federal Reserve be able to operate with a portfolio of only Treasury securities without holding a very high share of outstanding and new issues of Treasury securities, which we would want to avoid? I think we need to know more about this before we can make some tactical choices about the framework.

The political economy issues that would arise if the Federal Reserve were to issue its own short-term liabilities, so-called Federal Reserve bills or Fed bills, also makes going down that path undesirable to me. And, as I mentioned earlier, I'm not convinced they would necessarily lead to more-stable financial markets.

Third, communications issues are also important to me. I appreciate the memo on communications that was circulated to the research directors. Communications considerations also lead me to think simplicity is better. Even if we were to choose an administered rate as our target, we will need to provide the public with some guidance on a market rate by which we gauge the stance of policy. I think communications would be simpler if we use a market rate as

our target. If we opt for a floor system, then the IOER rate would be an important tool for implementation, but our communications would focus on the market rate. I'd be interested in further work on how the public would understand a shift in the interest rate we might choose as a target, perhaps drawing on foreign experience.

Associated with communications is governance related to our choice of the interest rate target. Since gaining the ability to pay interest on reserves, we have successfully dealt with the governance issue arising from the fact that the IOER rate is set by the Board of Governors, while the FOMC has purview over monetary policy. Our normalization principles are clear that the FOMC sets the target range for the funds rate and uses the IOER rate to move the funds rate into that target range. Even though we internally agree that the FOMC is responsible for monetary policy, I'd be concerned about the communications issues that would arise if the IOER rate were chosen as our target rate. That is another reason I prefer choosing a market rate as our target. The funds rate is most familiar, but using it as a target would depend on whether the interbank market remains robust enough so that the rate is tied to other market rates.

Finally, I support the approach we've taken of first focusing on the long-run framework and evaluating the costs and benefits of each option. But before we can make a final choice, we're going to need to have a better understanding of the transition costs when moving to the desired framework. For example, if we desire to move back to a corridor system, we'd need to shrink the balance sheet substantially. What would be the appropriate transition path? What would be the costs? Perhaps a lower equilibrium real funds rate, as discussed earlier, would be the outcome.

These considerations are important. We need to think about the transition costs and paths, and I would welcome the staffs to begin to work on that. It may be that some things are

going to be ruled out because we really can't get there from here within any appropriate time frame. And I also would appreciate thinking more about what would be our appropriate long-run framework in a low- r^* environment. I think there are other aspects, other than the operational issues that the memos cover, that are important. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kashkari.

MR. KASHKARI. Thank you, Madam Chair, and I'd like to thank the staff as well for the excellent work. I appreciate a lot of the comments around the table about focusing first on the broader framework and then on the implementation issues. I think that would be worth spending time exploring.

One thing that I'm struggling with—and this may be a topic more for tomorrow than for today—is that many people around the table are concerned that we are in a low- r^* environment for the foreseeable future, yet at the same time there seems to be momentum building for raising rates. I find those two things somewhat inconsistent, but maybe we can talk about that tomorrow.

In terms of implementation, it strikes me that switching costs are high because there's a big downside risk if something doesn't work. So we shouldn't make changes unless there is a compelling reason to make changes. The FOMC had compelling reason during the crisis to switch from a corridor system to a floor system, and that shift was successful. But in light of that, as the staff said, all the various frameworks seem to work, and what we are doing now seems to be working pretty well, there doesn't seem to be a compelling reason to make a big change any time soon. I think the Chair mentioned this in her comments.

For me, when I look at where we are and where we're going, I favor a more passive framework, something that requires lower-frequency activity and lower cost. And that pushes

me toward staying in the floor environment, preferably with an administered rate, under which we focus our market rates expressed in a range, so that we're not in and out of the markets very actively. To me, like many others, this also raises governance questions, but I think they can be addressed. And I would encourage the staff to do some work to see how we could maintain the FOMC's role in that environment. Like many others, I do think the discount window seems to be broken, and I would encourage us to do more work on what reforms could look like.

In terms of the balance sheet, I, too, view the large-scale asset purchases as a tool to use when we are at the effective lower bound or in periods of market stress. I'd like to see the balance sheet return to maybe not pre-crisis levels, but as small as necessary to stay in the floor environment. I am not excited about getting into the active yield curve management business. I think it's hard enough to manage short-term interest rates and to express our reaction function to markets, let alone actively managing the yield curve. I think it implies a level of wisdom that maybe we may or may not have.

Finally, I am skeptical that a large balance sheet is necessarily good for financial stability. I understand the theory of crowding out maturity transformation, but if we're simultaneously pushing up asset prices, it isn't at all clear that a large balance sheet is a net benefit for financial stability. But, again, it's worth doing more work on. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Fischer.

MR. FISCHER. Thank you, Madam Chair. Like everyone, I am grateful to the staff for its work in producing this comprehensive set of documents. This is an important stage in thinking through how we're going to move ahead and where we're heading. I'm sure that wherever we're heading is not a final destination, but that there's going to be many more changes in the financial system as time goes by.

I'm certainly happy, for the moment, to live with the current system, the IOER rate floor with abundant reserves combined with the overnight RRP facility. That system seems to be working pretty well at the moment and should continue to be a viable option for some time into the future. And I'd guess that it may be close to the system to which we converge 5 to 10 years down the road.

But we should acknowledge the potential political cost of paying interest on a large stock of reserves as well as another PE problem, which is that a large balance sheet is a standing invitation to even the most financially conservative of governments to raid the central bank. Two of the central banks that were raided were the Swiss central bank and the German central bank, whose gold reserves got to be worth too much and the government took funds away. Big balance sheets are politically problematic at times, and we need to be careful about that. I'd support efforts to shrink the size of the balance sheet, but it's not clear how far we should go, and we're going to have to work on that in the months and even years ahead.

In doing that, I was interested, as the study points out, that Australia and other countries are actually doing different things. For example, the DIRF and the FIRF, the standing facilities that allow either depository institutions or financial institutions to run a balance at the central bank, are being used in the United Kingdom and in Europe. It would be interesting to know how useful they are in determining the size of the reserves. Similarly, the statement that was made about how Australia is dealing with stigma was very interesting. I think it's very similar to the main proposal that's made in Mervyn King's recent book on how to reform the entire financial system. Again, we need to know how well these things are working, if they've started to work at all. The Australian one sounds particularly interesting, because I couldn't quite figure out how the three proposals we had for different facilities that would handle different uses of reserves

would deal with the stigma problem. I think that is absolutely critical because when a bank has a good reason for running into trouble and we don't want it to collapse, lending to it makes sense, and it would be useful not to have the stigma.

On the LSAPs and when we use them, I'm not quite sure of the logic of what we're saying. If we are going to be prepared to use LSAPs, I don't see why we should run ourselves all the way down to zero and then start using the LSAPs. That means we're more likely to hit the effective lower bound than we would be otherwise, and I'm not sure we want to be there if reasonably sized operations in the assets that we have could be used to prevent us getting to zero. I think we need to rethink the view that we have to change regimes very sharply rather than slide into them with the hope that by sliding, you increase the probability that you're not going to get to where it looks like you're going.

I want to talk a little bit more about the balance sheet as a tool for managing financial stability concerns. There are suggestions that we should structure the balance sheet in such a way that it makes it easier for us to intervene in a variety of circumstances or in a variety of industries that might get into trouble. Obviously the one that is clear is housing, and we're already doing that as part of our portfolio. I don't think we should go too far on this because we're going to look like micromanagers of the economy if we've got this little fund for that industry and another little fund for another industry, and so forth. Anyway, the financial markets kept working to some extent even during the Great Financial Crisis. So I think that our normal mode of operation, which is to set the interest rate and to leave it to the markets to decide on the allocation of the resulting changes in credit, is the right mode, both politically and economically. And the politics are very complicated. We're not elected officials, and when we start deciding

that we should be intervening in this industry or the other, we would be making decisions that are much closer to being political than what we do when we deal with the overall balance sheet.

I don't think it's a big problem if the balance sheet, which obviously would continue to include short-term government obligations, included long bonds. This is related to the fact that the model that we use for most of our simulations and forecasts actually relies on the long rate to affect output and not the short rate. Now, either the model is wrong, and possibly that's the end of that story, or if the model is right, then I think having long-term bonds could be useful. And then, at least at present I don't think we should get rid of the MBS in a given morning, but I'm not sure we want to keep a big supply of MBS there. We can intervene in that market, if the need arises, with our general balance sheet. I also suspect that the more we go into specific areas, the more political problems we're going to have, and that we just shouldn't do it.

Monetary policy should be macroeconomic, not microeconomic. Thank you.

CHAIR YELLEN. Thank you. Governor Brainard.

MS. BRAINARD. Thank you, Madam Chair. Let me join everybody else in thanking the staff for the very thoughtful memos. The key considerations associated with our longer-run framework entail important tradeoffs, and the information needed to weigh them is necessarily very incomplete as a result of the unusual circumstances, which we still find ourselves in today, that led to the expansion of the balance sheet and a number of fundamental changes that have taken place concurrently. Short-term money markets continue to evolve, as does the demand for reserves, while the effect of our balance sheet on liquidity and maturity transformation and on economic activity more generally is difficult to estimate. This is especially true because the regulatory environment affecting money markets changed dramatically during the same time period, and technology is changing these markets in important ways.

I want to associate myself with the consideration introduced by President Lockhart that in this environment, it's very difficult to evaluate the desired end state without taking into account the initial conditions that we're starting from and considerations associated with the transition path. I also would associate myself with the sentiment introduced by President Williams that it is impossible to separate these considerations from considerations regarding the appropriate monetary policy and macroeconomic framework. Indeed, it was the dawning recognition of the substantial change in the neutral rate of interest that led us initially to change the language in paragraph 5 last December to say, essentially, that we would not contemplate any reinvestment until normalization was well under way. And I think markets have responded to that as we anticipated.

I will, having said that, try to assess the thought experiment that you put on the table for us. But, again, I hope that, as we go forward, we'll be able to integrate those different elements. Let me just briefly touch on the balance sheet. I agree with our current principles, which state that the balance sheet should be no larger than necessary to effectively conduct monetary policy. But it is very uncertain what this minimally necessary level is, and I doubt it is as small as levels maintained before the financial crisis, for many reasons. Money markets have changed materially, with significant activity outside the interbank funds market. We will want to maintain our ability to influence these markets, which will likely require having a larger balance sheet in steady state. In addition, the demand for safe assets is higher than in the pre-crisis period, and the crisis brought into sharp relief the risks associated with private-sector money-like instruments. Together, these developments suggest that the demand for reserves is likely to remain elevated above pre-crisis levels. In addition, the need for accommodation in the proximity of the effective lower bound will likely be greater, because the neutral rate is markedly

lower than before the financial crisis. And this means we will likely want to leave space for balance sheet expansion under exigent circumstances. Echoing sentiments expressed by others, I would observe that this, perhaps, is the best tool under those circumstances.

When considering the operating regime, I would prioritize maintaining and, where appropriate, enhancing the facilities we have for interest rate control and, importantly, for liquidity provision. Maintaining several tools will be useful, regardless of the interest rate target we choose. Of course, we will want to continue with the interest rate on reserves, which will likely continue to be an important tool. The second is the overnight RRP facility. As a great deal of money market activity takes place outside the interbank market, it will be important to continue operating this facility or at least maintain it in a state of operational readiness, although I prefer the first. I'd also be open to creating an RRP facility to enhance interest rate control, though I regard this as somewhat less important. We also need liquidity facilities, as the crisis made clear. It's not clear that the discount window can be fully adequate because of the stigma associated with it. One possibility that many have supported, and I do too, would be to supplement the discount window with a standing auction facility. In addition, as we learned from the crisis, in certain circumstances it may be important to be operationally ready to act as a lender of last resort to a wider range of financial market entities beyond our traditional counterparties. Ensuring that our operating tools can achieve interest rate control, access to liquidity, and financial stability will likely mean working with a wider range of counterparties while structuring these interactions to minimize moral hazard.

Regarding the target rate, the current configuration of the funds market is highly unusual. It's difficult to say how stable the market will be in the period ahead, but it seems unlikely the funds rate will be the most effective way to implement and communicate policy. Certainly we

wouldn't have chosen the funds rate if we had started from scratch in today's conditions. The same appears to be true of the OBFR. Eurodollar lending has dropped noticeably of late as money market reform has gone into effect. It's also hard to imagine moving at this juncture to a regime in which we choose the repo rate as our target. This strikes me as a quite dramatic change, and so, of necessity, given the initial conditions, it seems likely we're going to remain in circumstances in which we have several rates.

Finally, again, I want to say that the analysis did a very nice job on abstracting from current circumstances. It really helped to clarify some of the tradeoffs. Now that we've seen that analysis, as we go forward we'll probably benefit greatly from having analysis that integrates considerations of the monetary policy framework with the long-run operating framework as well as taking into account possible transition costs. Thank you, Madam Chair.

CHAIR YELLEN. Thank you, and thanks to everyone for your thoughtful comments and suggestions. I'll wrap up our discussion with a few comments of my own on the three questions. However, I want to say at the outset that I agree with Presidents Bullard, Rosengren, Williams, and other participants who have weighed in on the larger issues pertaining to our monetary policy framework. I certainly agree that in light of our growing recognition that the equilibrium real funds rate is likely to remain low for a long time, we need to think about a broader range of issues. Let me just say, I am more than open to further work and discussion on these topics in the coming months.

Turning to the questions, regarding the first one, I, like most of you, prefer a floor system that involves us operating on the flat portion of the demand curve for reserves. Such a system is very simple to operate, and it may foster an efficient payments system. In view of the likelihood that we may again hit the effective lower bound in response to future adverse shocks, it's clearly

advantageous that such a system seamlessly accommodates large-scale asset purchases. I certainly hope that we will have a chance to shrink our balance sheet substantially before that happens—namely, another adverse shock—but it’s something we can’t count on. I think that reducing mandatory reserve requirements to zero also seems worthy of further evaluation, especially in light of improved liquidity regulation.

With respect to the choice of a policy rate, I don’t yet have a clear preference, although selecting an administered rate has considerable appeal for the reasons Vice Chairman Dudley articulated. There is no particular short-term interest rate that is invariably especially relevant to the transmission mechanism. That depends on the overall state of financial conditions. The federal funds market is idiosyncratic and vulnerable to structural changes and shifts in the business models of Federal Home Loan Banks, and I worry that activity may erode further over time. However, I do think we need to think carefully about possible unintended consequences of making changes—for example, something a couple of you mentioned, a tightening of the overnight RRP–IOER rate spread that could significantly alter the functioning of the federal funds market and other unsecured markets. One issue that featured prominently in our earlier normalization discussions was whether there would be market or legal ramifications stemming from the drying up of activity in that market, as many financial contracts reference the effective federal funds rate. As Governor Powell mentioned, there may be solutions—I hope there are—to this potential problem, especially if we communicate our intentions well in advance of any change. But I think it is important to proceed carefully.

On the second question on liquidity provision, it’s possible that facilities like the depository institution repo facility, or DIRF, could enhance interest rate control by providing an effective ceiling on short-term interest rates, although providing such a ceiling is less important

in a floor system. That said, stigma and reluctance to borrow at the discount window have been long-standing issues, and we may need to do more work in this area before settling on appropriate options. Regarding the financial institutions repo facility, or FIRF—I think that’s a novel idea and might be useful in some frameworks. But I do think we need to be cautious about using our authorities for open market operations when they could be viewed as lending facilities for nonbank firms.

Turning to broad-based liquidity strains, the term auction facility did prove to be quite effective during the crisis, because its design features helped overcome stigma, and I think in light of that experience, the TAF should remain part of our toolkit. Whether it should be a standing facility or a contingent one is an open question, although in either case, it appears that the facility could be rapidly deployed if needed. A problem with contingent facilities is that the act of using them may be taken as a dire signal and reinforce negative market dynamics. But a standing facility also could have costs, including increasing moral hazard and altering the current role of Federal Home Loan Banks in the financial system. As I can foresee a role for the TAF regardless of our future choice of long-run framework, we could consider whether any enhancements are worth making in the next couple of years and whether some regular small-value testing of the facility is appropriate. But again, hereto, I don’t think there is much urgency.

Finally, on the third question, as I articulated in my speech at the Jackson Hole symposium, I believe large-scale asset purchases are an essential part of our toolkit. They played an important role in fostering recovery from the crisis, and we very well may need to use this tool again in the future, particularly if scope for conventional interest rate cuts remains limited. My inclination at this point would be to deploy asset purchases in conjunction with hitting the effective lower bound on the policy rate, rather than as a separate tool.

Regarding financial stability, I do support using the balance sheet to address acute stress in the financial system, as we did during the crisis, but I really think the bar should be quite high for using the balance sheet as a routine tool to pursue financial stability objectives. Maintaining a large balance sheet to crowd out private money-like assets and flatten the yield curve is intellectually intriguing, but from a practical perspective, our knowledge in this area remains very limited. And, as a general point: Sustaining any proactive use of our balance sheet requires the understanding and support of the public—which is no small thing. Even in times of crisis, when the cost of inaction loomed large, our actions drew a great deal of criticism. In normal times, pursuing such policies could simply lead to a change in our statutory authority. Such an outcome would be particularly unfortunate, because it could eliminate our ability to use the full range of tools when they are most needed.

Let me stop there. As I noted at the outset, we need not be in a hurry to make decisions about our long-run framework, and our deliberations will surely be informed by another year or two of experience. As we wrap up this phase of work on the long-run framework, let me again express my gratitude to the staff. And, at this point, I would suggest that the senior staff, based on the views expressed today, consider any potential areas in which we could make improvements over the next year or two without materially constraining our choices down the road. I think we have had a very good discussion, and we are entitled to take a break for lunch [laughter], which is available next door. We will reconvene in a little bit less than an hour, at 1:30.

[Lunch recess]

CHAIR YELLEN. I think we are ready to get going again, and we are going to now move to “Financial Developments and Open Market Operations.” Let’s call on Simon to begin the presentation.

MR. POTTER.² Thank you, Madam Chair. Over the intermeeting period, domestic asset prices were largely range-bound, although inflation compensation increased amid a rise in oil prices. Markets have largely priced in a December rate hike with little drama, and market participants appear focused on global risks, including concerns over the sustainability of monetary policy stances abroad and political and financial stability in Europe and China.

Over the intermeeting period, the market-implied probability of an increase in the target federal funds rate at or before the December FOMC meeting drifted higher. The probability is currently around 70 percent, as shown by the dark blue line in the top-left panel of your first exhibit, about 30 percentage points above the level seen just before the October 2015 meeting, the light blue line. The current market-implied probability of a hike at or before the December FOMC meeting is arguably about as high as can be expected, in view of the time remaining ahead of the December meeting and intervening risk events, which include the U.S. election and two employment reports. In the Desk’s most recent surveys, the average probability of a hike by December was a touch lower, at about 60 percent. Meanwhile, the market- and survey-implied probabilities of a rate hike occurring at this meeting are essentially zero, with market participants pointing to the lack of a press conference and the upcoming election as effectively eliminating the possibility of a rate hike.

Looking past 2016, the market-implied path of the target federal funds rate is little changed over the last few months, as shown in the top-right panel, and continues to suggest that investors expect a very gradual normalization path. The expected path implied by the Desk surveys, the pink diamonds, is also little changed. Both the market- and survey-implied rate paths remain well below the path implied by the median SEP diamonds, especially over the longer horizon. As we have discussed, a large portion of this gap is attributable to the SEP being a median of modal paths based on continued economic expansion, while Desk survey responses represent a mean expectation for the path of the policy rate. Indeed, respondents to the Desk’s surveys continue to assign a roughly 25 percent probability of a return to the effective lower bound before the end of 2019.

Market participants continue to debate the notion of tightening in an era of unconventional monetary policy. Some investors date the first tightening step by the FOMC to May 2013, the so-called taper tantrum, while others look to the end of balance sheet expansion two years ago. Of course, a more conventional view is that the first tightening took place last December. The middle-left panel shows how indicators of financial conditions have changed since two possible dates for the start

² The materials used by Mr. Potter and Ms. Logan are appended to this transcript (appendix 2).

of tightening. Two indicators stand out: first, the consistent decline in the 10-year Treasury yield, and, second, the large increase in the exchange value of the dollar before liftoff. These movements could, at least in part, be explained by the evolving policy stance of advanced economy central banks. But market participants are still working to understand the implications of a tightening that to date is more reflected in exchange rates than interest rates for the reserve currency.

Over the intermeeting period the dollar appreciated broadly, as shown in the middle-right panel, but only $\frac{3}{4}$ percent on a trade-weighted basis. Some special factors produced this modest trade-weighted appreciation. For example, the Mexican peso appreciated 4 percent because of shifts in expectations for the outcome of the U.S. presidential election, and the Russian ruble appreciated roughly 3 percent, in large part because of an 8 percent increase in oil prices.

The increase in oil prices also contributed to a rise in measures of inflation compensation, as shown in the bottom-left panel, with the five-year, five-year-forward breakeven up about 20 basis points. While acknowledging the disconnect with theory, market participants continue to emphasize that spot inflation affects far-forward inflation compensation, as long tenors offer the most liquidity and are thus traded most actively.

Inflation compensation also increased in other G-4 countries, as shown in the decomposition of changes in 10-year nominal sovereign yields in the bottom-right panel. While the increase in oil prices was reportedly the primary driver of these changes, investors also noted a perceived shift in the willingness of global monetary policymakers to tolerate higher levels of inflation. Market participants highlighted Chair Yellen's discussion of the merits of running a "high-pressure economy," Bank of England Governor Carney's comments on his willingness to overshoot the inflation target, and the BOJ's explicit commitment to overshoot its inflation target.

Nevertheless, forward measures of inflation compensation remain well below target levels, except in the United Kingdom, and market participants remain focused on the efficacy and sustainability of monetary policy stances abroad, especially for the Bank of Japan and the ECB. The top-left panel of your second exhibit summarizes recent policy announcements from the Bank of Japan and the ECB. Overnight, the Bank of Japan announced no change in its stance but acknowledged that inflation would take longer to reach the target than previous forecasts.

In addition to announcing a commitment to overshoot its inflation target in September, the Bank of Japan introduced a yield-curve-control framework of targeting a 10-year nominal JGB yield of around 0 percent. Doubts remain over whether the Bank of Japan can reach its inflation target, and many suggest there is tension between the 10-year yield target and the Bank of Japan's commitment to expand the monetary base by around ¥80 trillion per year—that is, both a price and quantity target for its asset purchases. As part of its new regime, the Bank of Japan introduced a fixed-rate operation to purchase mainly on-the-run JGBs with no pre-

specified limit. However, this tool has yet to be used, as the 10-year rate has remained around zero.

The ECB made no changes to its policy framework. However, most market participants expect that at its next meeting in December, it will formally extend its asset purchase program past March 2017. An extension would require adjustments to the program parameters to increase the universe of eligible assets for purchase. These adjustments could include a removal of the minimum yield floor, an increase in the issue and issuer share limits, or a shift in the distribution of purchases away from the capital key.

Outside of concerns over the effectiveness of monetary policy, a series of other medium- to long-term risks continue to garner attention. In the United Kingdom, a considerable amount of uncertainty remains regarding Brexit—specifically, what the implications will be for the U.K. economy and political cohesion in Europe. Over the intermeeting period, comments from elements of the U.K. government increased the perceived likelihood of a hard exit from the European Union, which would significantly reduce economic linkages between the regions. This increased likelihood of a so-called hard Brexit led to a broad-based depreciation of the pound, including 6 percent against the dollar, and contributed to the roughly 50 basis point widening in 10-year U.K. inflation breakevens, as shown in the top-right panel.

In addition, the British pound experienced a flash-type event during the early hours of the Asian trading session on October 7, depreciating abruptly by roughly 9 percent against the dollar before retracing in a matter of minutes. The event follows similar sharp moves in the dollar–yen and euro–dollar currency pairs last year and reinforces concerns some have about the robustness of liquidity in the world’s most heavily traded currency pairs.

Despite uncertainty associated with Brexit, U.K. and euro-area economic data have been quite resilient in the wake of the referendum, at least thus far. Some investors speculate that if Brexit appears positive for the U.K. economy in the short-term, other European countries may face similar internal political upheavals. Market participants view the December constitutional amendment referendum in Italy and elections in Germany and France next year as key risk events for the euro area and broader European project. On top of these political risks, investors had renewed concerns about the stability of the European financial sector. Over the period, market participants were focused on Deutsche Bank and its capital adequacy. The bank’s stock hit a multidecade low and its CDS widened well above its peers, as shown in the middle-left panel. Deutsche Bank has experienced deterioration in market participants’ assessment of its business model, recently highlighted by reports of hedge fund clients moving relationships away from it amid speculation over the level of a settlement with the U.S. Department of Justice.

While there have been limited spillovers from Deutsche Bank thus far, the concerns over its capital adequacy are symptomatic of Europe’s broader banking-sector challenges. The middle-right panel shows that the price-to-tangible book ratio

for Europe's banking sector—a common valuation metric—remains well below ratios for U.S. banks. The low valuation reflects concerns about European banking business models amid low or negative interest rates and an oversaturation of banks in the region. Euro-area banking assets account for roughly 300 percent of GDP, compared with about 100 percent of GDP in the United States. Michael Palumbo and Steve Kamin will talk further about banking-sector valuations in their briefings.

Outside of Europe, market participants remained attentive to China. As shown in the bottom-left panel, the RMB depreciated 1½ percent against the dollar over the intermeeting period. Meanwhile, the RMB declined about ½ percent on a trade-weighted basis. Market participants have become less focused on the short-term financial stability risks that China poses to the rest of the globe, largely because they seem more comfortable with the new exchange rate policy and the official sector's general capacity to control short-term stress. However, many view the continued depreciation of the RMB against the dollar as reflective of ongoing capital outflow pressures. Market participants suggest mainland Chinese investors are increasingly searching for offshore investment opportunities in anticipation of continued currency depreciation and the possibility of enhanced capital controls. In the face of these capital outflow pressures, China's foreign reserves have declined notably since 2014, as shown in the bottom-right panel, as substantial FX intervention has been used to slow the pace of depreciation. While fears of another sharp devaluation in the near term are reportedly minimal, if the dollar were to appreciate in the coming months, many expect that capital outflows from China would accelerate and could ignite global financial market instability. Finally, investors are keenly focused on the Party Congress next fall when the extent of President Xi's power is likely to be revealed. This could have important implications for further financial liberalization in China. Lorie will continue the briefing.

MS. LOGAN. In exhibits 3 and 4, I'll cover money markets and Desk operations. The implementation of SEC money fund reform continued to be the primary focus in money markets over the intermeeting period, with the compliance deadline for the reforms on October 14 passing without material disruption in funding markets. However, the large reallocation of assets away from prime funds over the past year and the corresponding shift in liquidity management of the remaining prime fund assets have significantly affected the structure of some short-term markets and the cost of funding for some borrowers.

As shown in the top-left panel, while the overall size of the money fund industry has remained relatively stable, prime fund assets under management have fallen roughly \$1 trillion over the past year. This decline exceeded the average of expectations reported in earlier surveys taken in late May and early September. The bulk of the outflows moved into government funds, with their assets under management reaching \$2.1 trillion. As shown by the dashed lines in the panel, respondents to our most recent survey of money funds expect only a small portion of these flows to reverse. As shown by the blue line in the top-right panel, the weighted average maturity of prime institutional funds has declined significantly over the past year, though it has rebounded slightly since October 14, as prime fund managers'

uncertainty about additional investor withdrawals decreased. As shown by the blue dashed line, survey respondents expect the weighted-average maturity to continue to increase but remain well below historical levels.

Prime funds responded to the decline in assets under management by reducing holdings of all major asset classes. As shown in the middle-left panel, prime fund holdings of commercial paper and bank deposits fell more than \$700 billion over the past year. As prime fund lending in unsecured term money markets declined, the banks borrowing in these term markets, which are largely foreign banking organizations, have had to pay higher rates. As shown in the middle-right panel, the spreads of three-month CP, CD, and LIBOR rates over three-month OIS have widened around 30 basis points since late last year, and Desk survey respondents project the spread to narrow only modestly.

Part of the decline in bank deposits was a sharp reduction in overnight Eurodollar volumes, which are shown in the bottom-left panel. Prime funds have historically accounted for more than 80 percent of lending in the overnight Eurodollar market. Importantly, overnight Eurodollar volumes could fall further still, if, as is expected by survey respondents, prime funds shift away from existing overnight investments to reextend their weighted-average maturities. Meanwhile, volumes in the overnight federal funds market, shown in light blue, have remained steady.

The decline in overnight Eurodollar volumes appears to have exerted only modest upward pressure on the overnight bank funding and effective federal funds rates. Both rates averaged 41 basis points over the intermeeting period, excluding month-ends, compared with 40 basis points last period. One explanation for the relative lack of effect on these overnight rates is that many bank borrowers have been conducting these trades for arbitrage purposes and have little need for overnight funding at the margin. They have therefore responded to the shift in supply of funds by reducing overnight borrowing rather than paying higher rates. However, as shifts in the Eurodollar market have the potential to affect the federal funds market, we will continue to monitor these developments closely.

While the reallocation from prime to government funds has been substantial, government funds have been able to invest the new cash without major effects on related market rates. As shown in the bottom-right panel, most of the funds have been placed in repos and in U.S. Treasury bills. The smooth transition has been attributed, to a large degree, to the availability of repo investments, including the overnight RRP facility, as well as to sizable increases in the Treasury bill supply. While the roughly \$500 billion increase in net supply of U.S. Treasury bills over the past year has helped absorb a large portion of the new demand, it's important to note that bill supply is expected to decline significantly ahead of the next debt ceiling deadline in March.

As shown in the top-left panel of your final exhibit, some of the increase in repo investment has been in the overnight RRP facility, which, excluding quarter-end, averaged about \$190 billion, \$110 billion higher than last period's average. Looking

ahead, Desk survey respondents expect overnight RRP usage over the next year to remain somewhat higher than historical averages.

Market participants had noted some concern for potential stresses at the September quarter-end, due to the combination of money-fund reform and typical quarter-end balance sheet adjustments. Market functioning was orderly across money markets though, with changes in rates and volumes on the quarter-end date broadly similar to what we've observed in previous periods. However, as you can see in the top-left panel, overnight RRP usage increased to a greater extent than typical in the days around quarter-end, largely the result of government funds temporarily placing reform-related inflows into the facility. Usage reached \$413 billion on the quarter-end date, with nearly all of the increase coming from government funds.

In addition to the usual quarter-end dynamics, uncertainties related to both money market reform and the concerns related to Deutsche Bank reportedly put upward pressure on the FX swap basis. As shown in the top-right panel, the three-month basis of key U.S. dollar currency pairs widened in the run-up to September quarter-end.

Similarly to previous periods, we saw demand at recent ECB, and to a lesser extent, BOJ dollar auctions over quarter-end as well as sporadically over the weeks following, as shown in the middle-left panel. Demand has fallen at the most recent auctions, with banks demanding just over \$1 billion from the ECB. Shifting to the SOMA portfolio, Treasury and agency MBS reinvestment operations continue to proceed smoothly. Similarly to previous cycles, reinvestment purchases of agency MBS were elevated, driven primarily by the ongoing low level of mortgage interest rates and resulting pickup in refinancing activity.

On the Desk's policy surveys, the median expectation for the timing of a first change in the Committee's reinvestment policy stands at 18 months ahead, or in the second quarter of 2018, as shown on the left-hand side of the middle-right panel. The expected timing of the first change has moved out considerably since liftoff last year, when the median respondent expected a change to the reinvestment policy approximately 12 months forward, or around December of this year. Many respondents appear to view the timing of a change as linked to the level of the target federal funds rate, and, consequently, the expected timing has been pushed out, as expectations for the pace of policy rate normalization have become more gradual. As shown in the right-hand side of the panel, the median response for the level of the federal funds rate when a change in reinvestment policy first occurs has remained steady this year at 1.38 percent.

Regarding the foreign portfolio, early last month the Desk began a three-month process of reinvesting maturing euro proceeds to match the new target asset allocation, which, as shown in the bottom-left panel, will result in an increase in cash and longer-term securities. In addition to continued purchases of French and German sovereign debt, we are now buying Dutch sovereign securities, and these new transactions have proceeded smoothly. For the yen portfolio, as we still receive an

interest rate of zero on Bank of Japan deposits, we are leaving maturing proceeds and coupons from securities holdings on deposit with the Bank of Japan for the time being.

Lastly, as we briefed the Committee at the December 2015 FOMC meeting and as discussed in a memo circulated last week, the staff has been exploring the production and publication of an overnight Treasury general collateral repo benchmark rate, in coordination with the Treasury Department's Office of Financial Research. This work is summarized in the bottom-right panel.

In pursuing the development of a Treasury GC repo rate, the staff had three main objectives: first, to improve the amount and quality of information on the repo market available to the public; second, to produce a rate aligned with the IOSCO Principles for Financial Benchmarks that could be considered as a reference rate in financial contracts; and, third, to produce a rate that is correlated with other money market rates, resilient to market evolution, and could be considered as a potential backup monetary policy rate. In order to achieve these goals, the staff is currently proposing the publication of three daily secured benchmark rates: one comprising triparty transactions collected from Bank of New York Mellon; a second comprising the triparty transactions as well as GCF data collected from the DTCC; and a third comprising the triparty transactions, the GCF transactions, and the Fed's repo-based open market operations. All three rates would be calculated as a volume-weighted median. A Desk statement scheduled for publication Friday will describe the three potential benchmark rates, the motivation and purpose for their publication, and the proposed calculation methodology. A draft of that statement was included in the memo circulated before the meeting. The staff also intends to release a *Federal Register* notice asking for public comment on the proposed rates.

To conclude, your appendix contains a summary of operational tests performed over the intermeeting period and those planned during the next period. Thank you, that concludes my prepared remarks.

CHAIR YELLEN. Questions? Governor Tarullo.

MR. TARULLO. Thank you, Madam Chair. I have two factual questions, and I think they are both on Lorie's part of the presentation. Lorie, I infer from what you said that the roughly \$1 trillion in prime fund investments that flowed out was not replaced euro-for-euro or dollar-for-dollar by the former recipients of those investments. But to the degree that there was replacement, what were the sources of the funding that they got that had formerly been provided by the prime funds? If banks were getting investments from the money market funds, they may not have replaced dollar-for-dollar what they were getting, as you explained. But they obviously

replaced some significant proportion of what they were getting. Who was making those investments?

MS. LOGAN. One of the other things I noted was the widening in the FX basis swap, and I think some of the foreign banking organizations turned to the dollar swap market to obtain dollars by swapping out yen or euros or something into dollars, and that was putting pressure on that swap. So I think they turned to that type of investment product as one alternative.

MR. TARULLO. I see. But does that mean that the balance sheets of the European banks were, on net, reduced, because they were just swapping assets rather than getting new funding?

MS. LOGAN. I think, in the term markets, they tried to replace some of that. I think, in the overnight markets, a lot of that was arbitrage trading taking place in Eurodollars, and I don't think they replaced that.

MR. TARULLO. Okay, got it. Thank you. The second question is on the take-up of ON RRP. Again, I think I'm trying to read between the lines of what you did say, but I want to make sure I understand it. The quarter-end take-up was substantially larger than the past couple of quarter-ends, which I found, when I first looked at the chart, a bit counterintuitive. I thought one of the reasons why the quarter-end spiked in the past was that the European banks that are operating under this system of "it's the last day of the quarter that matters for your capital ratios" would want to reduce their balance sheets at that time. But that, presumably, should be less the case when the ON RRP market is dominated by government money market funds. You said that some of these government money market funds had parked the funds in the ON RRP initially. But does that mean you expect that subsequent quarters will not have this kind of spike?

MS. LOGAN. I think we're still going to learn a lot from the quarter-ends, but I think we have also been seeing that type of balance sheet reduction take place in repo, particularly on the part of some of those European broker-dealers. So some of these government funds are invested in repo, and those balance sheets reduce as well.

MR. TARULLO. Oh, I see. Those would still be affected, yes.

MS. LOGAN. And I think the government funds are still having to do some replacement in the overnight RRP around quarter-end.

MR. POTTER. We just saw the same thing on month-end, that the government funds were a large part of the increase around the prime funds. So that's consistent with Lorie's story.

MR. TARULLO. I know it's hard to predict, but if one had to, would one predict an end-of-quarter spike that was somewhere between the spike at the end of September and those of the previous couple of quarters?

MS. LOGAN. It's hard to know. I think year-end also has its own thing, so that could be larger. What I was trying to emphasize was that we saw higher usage around just the quarter-end date—a couple of days before and a couple of days after. And I think those were higher than typical because of the placement temporarily. On the quarter-end itself, from what we've heard from market participants, it's largely dominated by government now. It still could spike—maybe not quite this high, but higher than it was before—from the repo balance sheets being used.

MR. TARULLO. Okay. Thank you.

CHAIR YELLEN. President Lacker.

MR. LACKER. Call on Eric first.

CHAIR YELLEN. Okay. President Rosengren.

MR. ROSENGREN. I wanted to follow up where Governor Tarullo just was. In the earlier discussion, Governor Tarullo had made the comment about no longer using the prime money market funds for the overnight RRP. And when I look at this chart, it highlights that they are not a particularly essential part of the overnight RRP. What are the costs versus benefits of no longer using them? I can think of one benefit from a financial stability standpoint, which is that having less prime money market funds may be, overall, stabilizing over time, and getting them out of the overnight RRP might be an effective signal of that. But are there countervailing costs that we ought to be thinking about when we consider who should have access to the overnight RRP?

MS. LOGAN. I should note that of the remaining assets under management for prime, \$131 billion of it is institutional, and I think that institutional amount is the part that we are more concerned would be flightier. So it's a fairly small number now. I think it's possible to consider either adding caps or eliminating prime funds as counterparties, and it's something we should study over the coming months. And I do think there is still this competitive arbitrage that may still be supporting interest rate control even at those low amounts. But it's also possible that they could seek access through government funds if they needed to use the overnight RRP as competitive pressure to the other rates they're receiving in money markets. So I think we should definitely look at it.

MR. ROSENGREN. Thank you.

CHAIR YELLEN. President Lacker.

MR. LACKER. Thank you. His question was more interesting than mine. [Laughter]
On the overnight bank funding rate, we understand that there is work going on to broaden its coverage to perhaps include bank deposits and stuff about where the Eurodollar funding is going.

I was interested in the prospects for that: Is that going to be easy? Are there impediments? Is it going to be hard?

MS. LOGAN. As we said in chart 15, most of that decline we think is related to money fund reform. We're aware that about \$20 billion to \$30 billion of that total decline might be related to moving some deposits on shore. It's a small portion of the total amount, but it is something we're studying. I think it would be quite complicated to get the instructions right, to capture the right amount of onshore deposits that we'd want for this type of reference rate, but it's definitely something that we're studying carefully right now.

MR. POTTER. This market is still much more diverse than the federal funds market in the sense that there are a lot more types of lenders rather than one type of lender for 95 percent of federal funds.

MR. LACKER. Can I ask a follow-up? What would be hard about it? I'm sort of thinking naively that \$10 million on deposit is \$10 million on deposit.

MR. POTTER. Jim.

MR. CLOUSE. One thing that's hard about it is that in the one case in which we had Eurodollar deposits move from a Cayman Islands branch to a domestic office, the deposits at the domestic office were classified as "demand deposits." So we have a deposit that is a money market instrument, but it's lumped in with many other types of retail deposits. As a result, you have to figure out, as Lorie was noting, how to write the instructions to capture the types of deposits that you would not want to use for monetary policy purposes.

MR. LACKER. Why wouldn't you want to use them?

MR. CLOUSE. Well, many of the deposits are retail liquid deposits, and we have rates on all kinds of liquid deposits right now that we are not using for the purposes of the OBFR. The

purpose of the OBFR is to try to capture a money market rate, not a retail deposit rate, and the rates on demand deposits, as you know very well, are just very heavily dominated by factors such as the market power of banks in retail deposit markets.

MR. LACKER. Yes. I'm just thinking that it was not necessarily the case that you want to limit it to capturing what was in Eurodollars, because obviously some wholesale funding goes on with deposit markets in the United States as well. Thanks for that explanation.

MR. POTTER. We are working on it. We will try our best to capture wholesale transactions rather than retail.

MR. LACKER. Sure.

CHAIR YELLEN. Okay. Are there further questions? [No response] Okay. If not, I need a motion to ratify domestic open market operations.

VICE CHAIRMAN DUDLEY. So moved.

CHAIR YELLEN. Without objection. Thank you. Now we're ready to move on to the "Economic and Financial Situation," and let me call on Eric Engen to get us started.

MR. MADIGAN. If I could interrupt just before we get started, in the financial stability package of briefings, on exhibit 2, you'll see that there's a missing panel. Corrected versions with the panel included are coming around right now. Thank you.

MR. ENGEN.³ Thank you. I will be referring to the exhibits in the handout titled "Material for Briefing on the U.S. Outlook." And I'm hoping that my exhibits are all included there in your packet.

As shown in panel 1 of the forecast summary exhibit, we continue to see real GDP growth picking up in the second half of this year from its subdued first-half pace. However, we did trim our near-term outlook for GDP growth in the October Tealbook from our September projection. Most notably, the incoming data on consumer spending have been somewhat weaker than we were expecting, and we put through a modest downward revision to our near-term PCE forecast. Our medium-term projection of real GDP is also a bit lower than in September, primarily reflecting

³ The materials used by Mr. Engen are appended to this transcript (appendix 3).

the effects of the somewhat higher paths of the dollar and crude oil prices in this forecast.

Last Friday, after the Tealbook had closed, we received the BEA’s advance estimate of third-quarter GDP. As shown by the blue dot, the BEA’s estimate came in a little above our Tealbook forecast, as stronger-than-expected net exports and inventory accumulation more than offset weaker-than-expected growth in consumer spending and business fixed investment.

With an essentially unrevised set of supply-side assumptions, the slightly weaker path of output in this forecast yields a projected path of the output gap—the black line in panel 2—that is a little lower than in September. That said, we see the output gap as currently closed and continue to expect that aggregate demand will rise faster than aggregate supply over the next couple of years, leaving the level of real GDP more than 1 percent above potential by 2019.

Turning to the labor market, the employment report for September indicated that job market conditions continued to improve and were broadly as we had expected. As shown in panel 3, the projected unemployment rate still declines over the next couple of years, but this path is a bit higher than in our previous forecast, reflecting the slightly smaller positive output gap. Likewise, as indicated in panel 4, we have edged down our forecast of monthly payroll job gains over the medium term, with total payrolls expected to rise over the rest of this year and next year an average of around 170,000 jobs per month. As projected real GDP growth slows, average payroll gains are expected to move down to 130,000 jobs per month in 2018 and to 100,000 jobs per month in 2019. This 2019 forecast is consistent with a “neutral pace” of payroll gains, in which the unemployment rate is stable and the participation rate is declining in line with its trend.

The next two panels provide a closer look at developments in the labor market by plotting the unemployment rate and the labor force participation rate for several broad racial and ethnic groups. In line with the aggregate unemployment rate—the black line in panel 5—the unemployment rates for these various groups are now quite close to the levels seen just before the last recession. Similarly, the differentials in jobless rates between the groups are close to their pre-recession levels. Panel 6 plots participation rates, where I have focused on persons between the ages of 25 and 54 as a rough way of controlling for the differing age composition of these racial and ethnic groups. Here the hint of an upturn that we have recently seen in the aggregate participation rate—the black line in the figure—is easily seen in a corresponding rise in the participation rate for whites—the green line. The measured participation rates for African Americans and Hispanics—the blue and red lines—are more volatile, but they appear to have been either moving sideways or also edging up recently.

The panels on the next page summarize the inflation outlook. Our near-term projection of headline PCE price inflation—panel 7—is somewhat higher than we had written down in September, largely reflecting an upward revision in the expected path of gasoline prices. However, core PCE price inflation—panel 8—has come in a

little higher than expected as well. Part of the upward surprise in core was in nonmarket components of the index. Although we typically take little signal for future inflation from quarter-to-quarter movements in these prices, our review of recent price trends suggests that nonmarket PCE price inflation has been running at a somewhat higher average pace than we had previously been assuming. We therefore marked up our forecast of nonmarket inflation in coming quarters. Therefore, while we continue to expect that core PCE price inflation will move lower in the second half of this year—a pattern that is partially attributable to the presence of some residual seasonality in the published price data—the anticipated step-down is not as pronounced as in our September forecast. Beyond the near term, the inflation projection is very little different from our previous forecast.

In panels 7 and 8, I have again used blue dots to show the BEA's advance third-quarter estimates for total and core PCE price inflation, which we received last Friday after the Tealbook closed. As you can see, these estimates came in about as expected. In addition, yesterday we received the BEA's personal income release for September, which included monthly data for PCE prices. The report implies that total PCE prices rose 1.2 percent over the 12 months ending in September, with a corresponding 12-month change for core prices of 1.7 percent. Looking ahead, we expect the 12-month change in the total PCE price index to step up to about 1.6 percent by the end of the year, while the 12-month change in core prices is projected to remain roughly flat around 1¾ percent in the coming months.

The next two panels reproduce the inflation monitor exhibits from the October Tealbook, which parse out the cumulative revisions that we have made to our projections of total and core PCE price inflation since December of last year, when you first raised the funds rate target 25 basis points. Total PCE price inflation, panel 9, is now projected to come in 0.3 percentage point higher this year as a result of the upward revisions to core inflation and energy prices that we made this round. The revision to this year's forecast of core inflation, which is parsed out in panel 10, is concentrated in the category labeled "other," the yellow portion of the bar, and is not attributable to a change in any fundamentals but simply reflects the fact that we have been surprised by the data this year—both the surprisingly high core inflation readings early in the year and the upward revisions we made this round in response to the recent price data.

As shown in panel 11, the final October reading on the median measure of longer-run inflation expectations from the Michigan survey—the red line—was 2.4 percent, the lowest level on record for this series. This measure can be quite noisy from month to month, but a smoothed trend of the series—the blue line—still shows a relatively steady decline over the past few years. However, we continue to think that a portion of the decline in this expectations measure may be attributable to the low rates of headline inflation seen over the past few years. When we try to control for the effect of changes in food and energy prices, the resulting estimate of the trend—the green line—doesn't decline as much lately and remains within the historical 70 percent range for the series, the gray shaded area. Of course, this result does not rule out the possibility that longer-run inflation expectations have moved down

somewhat. Thus, we continue to closely monitor these and other measures of inflation expectations and to assess the implications of their recent behavior for our inflation projection.

Panel 12 shows three of the measures of labor compensation that we follow. After the October Tealbook closed, we received the BLS's estimate of the ECI for September, and we updated our estimate of compensation per hour with our translation of the third-quarter personal income data. Both measures are roughly what we had expected. In general, nominal labor compensation growth has remained relatively modest, with just a hint of a pickup evident in some measures.

Finally, the last page uses our October Tealbook projection to update a table that provides a high-level summary of some of the key pieces of information that will be available to you at the next couple of FOMC meetings. I won't walk you through the details, though I would note that at the December meeting, the gold-shaded portion, we will have two more months of labor market data but only one additional month of PCE price data—for October—beyond yesterday's release for September. In addition, the November CPI will not be released until the day after the December FOMC meeting concludes. Steve will now continue our presentation.

MR. KAMIN.⁴ Thank you, Eric. I'll be referring to the materials labeled "Materials for Briefing on the International Outlook." I'll start by addressing the question that is doubtless on all of your minds right now: Where is Wallonia, and why did it represent the greatest threat to globalization since Brexit? As panel 1 shows, Wallonia is the French-speaking half of Belgium. It has virtual veto power over foreign policy decisions made by Belgium and also, it turns out, the European Union, which would not sign its seven-years-in-the-making free trade agreement with Canada, known as CETA, unless all 28 of its member governments agreed. So 3½ million Walloons, worried about the effect of CETA on their dairy industry, had been blocking the 500-million-person European Union from concluding its trade agreement with Canada. Wallonia finally caved last week after Canadian Prime Minister Trudeau canceled his trip to Brussels. But to the U.K. and EU negotiators who will spend the next couple of years hammering out a new trade agreement, all I can say is: Good luck with that!

As you may gather, I am stalling in an effort to avoid discussing our projection of foreign GDP, which is little revised from the September Tealbook. As can be seen in panel 2, foreign GDP growth plunged in the second quarter, reflecting transitory weakness in Canada and Mexico, major trading partners with large weights in our foreign GDP aggregate. As we'd expected, third-quarter data suggest that activity in both countries rebounded, pushing total foreign growth back to 3 percent. In the current quarter, GDP growth steps back down a bit as Canada's and Mexico's rebounds are completed and Brexit worries further slow the U.K. economy. Thereafter, the AFEs tread water while EME growth edges up as South America

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

limps out of its persistent deep recession. Total foreign growth, the black line, barely budges.

We have been anticipating reaching the completion of the economic recovery abroad for eight years now, and it's dispiriting to think that we've finally gotten here. But we've marked down our estimate of potential economic growth abroad to 2½ percent, compared with over 3 percent before the Global Financial Crisis. Much of that reflects declines in productivity growth, demographic changes, and structural shifts that are unlikely to turn around anytime soon. So, for now, our sense is that this is about as good as it's going to get.

With foreign economic growth and interest rates looking likely to remain subdued for the foreseeable future, there are a host of uncertainties for the foreign outlook. First, what will be the consequences of further divergence of monetary policies? As indicated in panel 3 by the solid blue lines, the staff forecast has the federal funds rate rising to 3 percent by the end of 2019, while an average of AFE interest rates edges up to ½ percent. Market expectations, shown by the dashed red lines, are for much less divergence over the next three years, mainly because they expect less FOMC tightening. In our baseline forecast of the dollar, shown in panel 4, we project that FOMC tightening surprises will contribute to a rise in the broad real dollar—that's the black solid line—of some 5 percent over the forecast period. This is based on our estimates that the broad dollar index rises 2.2 percent for each 100 basis points of surprise increase in the federal funds rate. But this elasticity has varied significantly over time, and as illustrated by the alternative dollar scenario discussed in the Tealbook, which assumes a 7.5 percent dollar move for 100 basis points of interest rate surprise in part as emerging markets are roiled by FOMC tightening, a much stronger rise in the dollar is entirely possible.

Besides its effect on the dollar, policy divergences may have implications for longer-term interest rates. Panel 5 shows that surprise increases in U.S. 10-year yields around FOMC announcements tend to boost German government yields about half that amount. Such developments would further complicate the tasks of many foreign central banks trying to keep financial conditions highly accommodative. By the same token, however, as shown in panel 6, foreign monetary policies tend to spill over to U.S. yields. Our forecast of rising longer-term Treasury yields incorporates some restraint from low yields abroad, but the restraint could be larger than we anticipate.

If the consequences of policy divergence are one major source of uncertainty, another is prospects for foreign monetary policy itself, especially by the BOJ and ECB. As indicated by the black lines in panels 7 and 8 on your next exhibit, both institutions are struggling with inflation rates that are near or below zero and well below their 2 percent targets. This represents a clear rationale for further stimulus. But at the same time, both institutions are concerned about the effects of further asset purchases on market functioning as well as the consequences of low interest rates for profitability in the financial sector. Finally, in both economies, the threat of recession or severe economic slack has receded: Japanese unemployment, the red line in

panel 7, has fallen to 3 percent, its lowest level in decades. Unemployment remains high in the euro area, at 10 percent, but is trending down as euro-area GDP expands at a lackluster 1½ percent pace.

Under these circumstances, we see both the Bank of Japan and ECB maintaining their highly accommodative policies but not adding a great deal more stimulus. On the second day of your September meeting, the Bank of Japan announced that it would target the 10-year yield near zero (a bid to keep the yield curve from flattening further and thus protect bank profits) and it would plan on overshooting its inflation target (a bid to get inflation expectations up). In the event, market settings were little changed by the announcement. Investors likely figured that, in view of the troubles the Bank of Japan was having getting anywhere close to its inflation target, a commitment to overshoot it didn't count for much. Meanwhile, the ECB is working through its own issues as it considers how to loosen its self-imposed constraints on asset purchases in order to continue those purchases beyond their notional ending point next March. We expect the ECB to extend its program through later next year but to keep its deposit rate unchanged at negative 40 basis points. All told, accommodative policy in both economies leads inflation to move up over the forecast period but remain shy of the 2 percent target.

Are worries about the financial system reason enough for central banks to forgo further stimulus? Many concerns have been raised that monetary accommodation, especially when rates are near or below zero, may lower bank net interest margins both because deposit rates cannot be lowered as much as loan rates and because shallower yield curves reduce profits from maturity transformation. One of our staff members, Nick Coleman, estimated the equation shown in panel 9 for European banks and confirmed that both declines in the level of short-term interest rates and shallower yield curves tend to lower net interest margins. But he also found that the negative interest rates and very shallow yield curves prevailing in Europe explain only a small part of why these net interest margins are so low. Moreover, the low profitability of European banks likely reflects other factors besides low NIMS, such as excess capacity, failure to cut costs, low GDP growth, and legacy of nonperforming loans.

Accordingly, protecting the financial system is probably not a sufficient reason to forgo further stimulus. Instead, what Japan and especially Europe need are assertive measures to restore banking system health, including cutting costs, consolidation, and concerted capital raising. The inadequate capital and profitability of Europe's banks pose two threats to the outlook. First, they may constrain lending, leading to lower investment and growth. Second, they raise the likelihood of bank failure. The Tealbook features an alternative scenario in which the deterioration in the financial position of a large systemic bank in Europe requires its resolution. Obviously, it's very difficult to predict the consequences of such an event. In our scenario, the failure of the authorities to bail out the bank, concerns that other banks may have similar problems, and difficulties implementing the resolution process trigger disruptive spillovers and a retreat from risk in global financial markets. Europe falls

back into recession, and—as shown in panels 10 through 12—the dollar appreciates, U.S. GDP growth slows, and the federal funds rate rises more slowly.

While we are on the topic of financial stability, I'd like to briefly remind you of a new product developed by the International Finance Division that was presented in the QS financial stability report a couple of weeks ago: the International Financial Stability Matrix, or IFSM. As shown in your final exhibit, the IFSM provides evaluations of financial vulnerability for 12 countries based on both quantitative data and judgmental assessments and, like the matrix for the U.S. economy, is built up from assessments of various key sectors. You may have noticed that I spoke about uncertainties in the foreign outlook for 10 minutes without discussing China. Indeed, China is one of the countries highlighted in our matrix as being especially vulnerable to financial disruptions, but describing its many issues would take at least another 10 minutes and would in any case cover pretty familiar ground. I will cede that time to Michael, who will discuss U.S. financial-stability issues.

MR. PALUMBO.⁵ Thank you, Steve. I'm going to refer to the second handout titled "Material for Briefing on Financial Stability." I'm going to review the staff's latest assessment of vulnerabilities in the U.S. financial system, drawing on the quarterly quantitative surveillance report (QS) you received two weeks ago. As the report highlights, we continue to judge overall vulnerabilities in the financial system as moderate, due importantly to strong regulatory capital and liquidity positions among our largest banks, an absence of widespread valuation pressures across major asset categories, moderate growth of credit in the nonfinancial sector, and the effects of new money market fund rules that have lessened some key vulnerabilities associated with maturity and liquidity transformation.

Turning to exhibit 1, the implementation of the new rules for prime money market funds has had a dramatic effect on the industry, as Lorie showed. The first panel shows that money fund managers and investors have shifted about \$1 trillion over the past year from prime funds, the red and blue lines, to government funds, in black. As a result, the volume of confidence-sensitive, short-term private borrowing financed by money funds—the black line to the right—has plunged. While this is good news for financial stability, we want to be attentive to how fund managers and borrowers adjust over time to the new environment. For example, as shown by the red line, as government money fund assets have grown, these funds have substantially increased their holdings of Federal Home Loan Banks' short-term paper. Moreover, the FHLBs appear to be increasing their own maturity transformation, as they have continued to lend at longer maturity to banks and nonbanks, including insurance companies.

In addition, financial institutions that used to rely on prime money funds appear to be turning more to funding secured by Treasury and agency collateral from government money funds, which is an increase in the funds' counterparty risk. Finally, it is far too soon to know whether the current elevated level of government fund assets under management will ultimately migrate to other higher-yielding

⁵ The materials used by Mr. Palumbo are appended to this transcript (appendix 5).

lending vehicles, which may be more run-prone than government funds. So, for now, we lowered our assessment of the vulnerability to the financial system stemming from maturity and liquidity transformation by just half a notch to “between low and moderate” from just “moderate” in July.

Turning to financial-sector leverage, we continue to assess this vulnerability as low. As shown by the black line in the middle-left panel, the most systemically important U.S. banks are currently holding high levels of regulatory capital. Their average Common Equity Tier 1 capital ratio is now the same as that for smaller non-CCAR banks, the dotted blue line, and the largest banks currently meet their fully phased-in Basel III capital requirements, including their G-SIB surcharges.

Large banks have been able to add capital in recent years even as net interest margins at the CCAR banks—the black line in the panel to the right—have been at very low levels, reflecting the effects of low short-term interest rates and a relatively flat yield curve. A reasonable question is whether these banks have shifted their activities so as to be susceptible to rising rates in the future, but the answer seems to be “not particularly.” The largest banks have been subject to such interest rate shocks in past stress tests, and the projected resulting losses have been manageable relative to capital—and much smaller than the losses generated under the severely adverse macroeconomic scenarios in the tests.

In terms of market indicators, premiums on credit default swaps for the largest domestic banks—plotted in the bottom-left panel—have remained relatively low in recent months, suggesting little concern among investors about the solvency of these firms. In equity markets, as shown to the right, equity price-to-book ratios have edged down this year, on net—the purple bars are a touch below the green bars for each firm—and are below 1 for some of these firms, reflecting ongoing investor concerns regarding profitability in the context of low interest rates, slow economic growth, and more-stringent regulation.

The foreign banks shown in the figure have experienced noticeably larger drops in price-to-book this year, and the tenuous situation facing Deutsche Bank that Simon and Steve mentioned is reflected in its ratio of only 0.3. Spillovers from Deutsche Bank to the United States have been modest to date, consistent with our view that the financial system is resilient. However, severe stress at the firm would be a stiffer test, and we included a box in the QS assessment describing some of the financial market channels through which the firm’s distress could be transmitted to the United States.

This QS round, we again spent a lot of time debating the assessment of systemic vulnerabilities associated with valuation pressures across a range of domestic asset markets. The top panel of exhibit 2 tries to convey the dilemma. The left-hand column of colors indicates that some key valuation metrics—the price-earnings ratio for S&P 500 firms, a “price index” for corporate bonds (reflecting the inverse of their yields), and the capitalization rate for recent commercial real estate transactions—all currently appear in the upper portions of their historical ranges, indicating “notable” (orange) or even “elevated” (red) valuation pressures. However, as shown in the

right-hand column, relative to the unusually low level of Treasury yields, valuation pressures are “moderate” (yellow) or even “low” (green). Thus, while the QS community generally agrees that low Treasury yields have continued to provide considerable support for risky asset prices, opinions are mixed about how resilient prices will prove to be. In addition, we think a sharp rise in Treasury term premiums toward historic norms would present a significant risk to valuations.

Our assessment framework for valuation pressures also includes monitoring nonprice developments, including lending standards and other indicators of investor risk appetite. For corporate debt and commercial real estate mortgages, we see those as having moderated, on balance, over the past year or so. In addition, exposures to credit losses from a drop in commercial real estate values are more significant for smaller banks than larger ones. All told, we ended up maintaining our assessment that, on balance, vulnerabilities from valuation pressures are moderate at present.

The remainder of exhibit 2 plots a few indicators of vulnerabilities from nonfinancial-sector leverage, which we also gauge to be moderate overall. Debt in the private nonfinancial sector expanded a touch faster than GDP in the second quarter, so the credit-to-GDP ratio, the purple line, inched up but remained well below its estimated long-run trend, the black line. Not all of us view that trend as representing benign developments in the U.S. financial system, however, so it is also worth noting that the current credit-to-GDP ratio is as high as it was in the middle of 2005.

In terms of the components of nonfinancial debt, aggregate leverage in the corporate sector has continued to be quite high by historical standards. However, as shown in the bottom-left panel, growth over the past year in the total amount of higher-risk debt (junk bonds and leveraged loans, measured here in real terms) owed by U.S. nonfinancial corporations has been slowing noticeably for several quarters and was unchanged, on net, over the past year. Moving to the right, you can see that the moderate aggregate rise in household debt has continued to accrue to borrowers with very high credit scores, the orange line. Exhibit 3 is the QS heat map, which, for the most part, resembles the version we presented in July. The exception is the maturity and liquidity transformation category of vulnerabilities, toward the bottom on the right, which we changed from yellow to half-yellow and half-green to reflect the consequences of prime money market fund reform.

Finally, the Board voted last week to affirm the current level of 0 percent for the countercyclical capital buffer for Advanced Approaches banks, based on the qualitative assessment that systemic vulnerabilities are not meaningfully greater than normal at present, so that large banking organizations do not need additional capacity to absorb above-normal losses at this stage of the credit cycle. Several quantitative guides based on nonfinancial credit growth, asset prices, and selected financial-sector indicators that we maintain currently prescribe a value of zero for the countercyclical capital buffer. Thank you. That concludes our presentations, and we’ll be happy to take your questions.

CHAIR YELLEN. Questions? President Lacker.

MR. LACKER. Yes. I'd like to hear more about this upgrade. What caught my ear was the increase in maturity transformation activity at Federal Home Loan Banks. Let me just verify that they're not off the table or out of bounds because they're quasi-government. If they're risky, it counts as risk for you, right?

MR. PALUMBO. Yes.

MR. LACKER. I want to verify that, but I also wanted to ask whether you have a quantitative sense that net or gross maturity transformation has decreased? It seems like it has gone from some places to some other places.

MR. PALUMBO. Right.

MR. LACKER. But is there is less of it now, or do you know that?

MR. PALUMBO. I wouldn't say there's less of it. I'd say we think it's in a little bit more stable, less run-prone form. The FHLBs, I think, are a bit of an open question. That's another area in which I think we're engaged in discussions among ourselves and in new research and analysis to think about, if that developed, how we would feel about it over time. Personally, I think anything that doubles in size over the course of a year is worth giving some attention to, and we are. And I know we've got some decent understanding and knowledge about the FHLB systems and how they're interacting with other money markets. But I think that's an area in which work is now going to be ongoing. But they're not off the table, so we wouldn't say that because they're agencies with implicit government support, we don't need to consider their activities in the context of the system.

MR. LACKER. Right.

MR. PALUMBO. So that's definitely not true, and we're just trying to see, compared with the highly run-prone prime money funds—which was, you know, from our perspective, a horrible vehicle for maturity transmission to take—whether this is a little bit of a better place to be. But that's why we're half yellow and half green, because we haven't really come down firmly on that particular question.

MR. LACKER. Can I follow up? Is it like a dollar-for-dollar wash— why is it a better place?

MR. PALUMBO. The mutualization of the prime money funds with the rounded NAV provided a first-mover advantage for highly sophisticated investors that evidently were unwilling to take chances on receiving their money a few weeks after they thought they were promised it. That was a very dangerous and run-prone vehicle.

MR. LACKER. Okay.

MR. PALUMBO. The FHLBs themselves are doing a lot of maturity transformation and more than they were a year ago because they've been adding short-term debt, and they've not, as best we can tell, shortened their asset side at all, or at least not meaningfully. So it's worth looking at, but it is different. I don't know a lot about the FHLBs, but they have the ability to take very senior positions in the debt structure of their lending. Again, that means that for better or worse, they do move up the seniority structure. So in that sense, they should be, at high frequency, a little more stable. But I think, as you might recall, FHLB discount notes' spreads soared in the financial crisis. They went to something like 150 basis points very quickly, and government money funds are not necessarily always going to be well positioned to absorb those price changes if they occurred. If the confidence in the FHLBs were to erode, then I think it could be a problem.

MR. LACKER. Yes. I remember learning suddenly about FHLBs when I discovered that the Atlanta one had a \$50 billion credit to Countrywide and a total balance sheet of \$120 billion. That caught my attention. How do you feel about the governance of these things? How do you feel about their incentives and how well they're run? And do you monitor their investment side? Do you have visibility into that?

MR. PALUMBO. I think we have visibility. It's a growth area for us. I'd say four months ago, the FHLBs were just entering the radar screen. Four months from now, I think we'll be able to, with much more confidence than I could do today, have a more definitive stance about what the issues are and how we feel about them.

MR. LACKER. You wouldn't criticize me for putting a little asterisk against this upgrade, would you?

MR. PALUMBO. No. Again, the half-green, half-yellow is signaling an asterisk from our perspective.

MS. LIANG. If I could make one comment. On the decline in the black line, the CD + CP + ABCP, I think you asked about where that funding has gone. We're not able to totally quantify it. Certainly, some of the European or Japanese institutions have termed out—gone a little bit longer. We've heard them going to other asset managers or to insurance companies for slightly longer paper. It makes us feel a little better. That would be one. In part, they are using the FX swap market, as Lorie said. So that's a plus, but we clearly wanted to show there are offsets here that need to be looked at. We think, on net, it's a little bit better.

MR. LACKER. Right.

CHAIR YELLEN. President Rosengren.

MR. ROSENGREN. Is yours a two-hander or one?

VICE CHAIRMAN DUDLEY. I just wanted to talk about the Federal Home Loan Banks for a second.

MR. ROSENGREN. Okay.

VICE CHAIRMAN DUDLEY. We met with Federal Home Loan Bank of New York in a week or two ago. A couple of points. One, the incentive system is pretty good in the sense that they're run as cooperatives. They're not trying to make profits for shareholders. So you don't have the Fannie and Freddie issues that you saw for the GSEs. Two, their capital is sort of self-created. As people take advances, it automatically creates capital. And the point that Mike made about them being super senior is really important. They're collateralized loans, but they're actually ahead of the FDIC in the capital stack. So if the depository were to fail, they actually have a claim senior to the FDIC. They presumably could get in trouble from an asset quality issue, but they're super senior. They could get in trouble from an interest rate or transformation issue, but I think they'd have to take a lot of interest rate risk to really get into great difficulty. So I guess my bottom line after talking to them and looking at their performance during the financial crisis is, it could always be a risk, but it doesn't seem to be something I'd put pretty high up on my list. That's one person's view.

CHAIR YELLEN. President Rosengren.

MR. ROSENGREN. Mike, I also have a question for you. It's on exhibit 2, and I'm trying to figure out in my own mind how much comfort I should take from the change between the "level" and the "adjusted for Treasuries." One way to think of this chart is, if we were in a bubble world, the orange-red-red would more than likely be orange-red-red in the second column, and that would be a bubble. If instead the mechanism was "reach-for-yield," then it might look a lot like the column that you actually have there. So I was trying to ask, in my own

mind, is there an inherent reason why the risk of price reversal is greater in an asset-bubble world than it is for a “reach-for-yield” one, and should I take comfort in the difference between these two columns?

MR. PALUMBO. Well, I can't say that you shouldn't. I think the reason we presented it this way is that, necessarily, you cannot feel better about the right-hand column than the left-hand column. As a group, we frankly ended up splitting the difference. And I tried to allude to that a little bit in my remarks, but I think we're of two minds. If you're just somebody who's discounting cash flows, and you're using a risk-free rate and you don't mind a rate that has a negative term premium in it to do your discounting, then, again, that's the sense in which the right-hand column gives you more comfort, and I think neither of these have super predictive power for what the future price changes are going to be, but, on average, there's probably a little bit of evidence for the right-hand side versus the left-hand side. But I think it's just a case in which we don't know. And I would say, to me, the low-term premiums as part of the calculus is part of the reason that I would be more inclined to hedge away from the right column toward the middle column. That's really an unusual pricing situation for these asset markets, and I guess I wouldn't want to be too confident about how that would play out with a shock or even maybe with something that's not even so shocking.

CHAIR YELLEN. President Williams.

MR. WILLIAMS. Jeff—

MR. LACKER. Yes, a two-hander.

MR. ROSENGREN. He had a two-hander.

MR. LACKER. Oh, did you want to—

MR. WILLIAMS. I have a two-hander.

MR. EVANS. It's a tie.

MR. WILLIAMS. We tied.

MR. LACKER. I think mine's reasonably interesting. [Laughter] Is one way to interpret this that if you look at the valuations all by themselves of these risky assets, they look overvalued? If you believe longer-term Treasury securities are at their right value, then these are not overvalued. And so then my next question is, is that a fair description?

MR. PALUMBO. It's certainly a description that you hear and that many people believe. [Laughter]

MR. LACKER. It seems implied by your colors, doesn't it?

MR. PALUMBO. I'm sure investors are taking many different approaches for valuations.

MR. LACKER. Can you guess my next question? Are Treasury securities overvalued?

MR. PALUMBO. I don't think Treasury securities are necessarily overvalued, but the term premium is out of its historical range. So I have to think about it a little bit more as an empiricist rather than a theorist. Of course, a year ago we said it was out of its historical range, more likely to rise than to fall, and subsequently we've been marking down our forecast of what Treasury yields would do and what term premiums would do, because it seems like the world is different than the one we expected.

MR. WILLIAMS. So that does set me up. There are a couple of issues about whether Treasury securities are properly priced. One issue is just this issue of very low r^* . How do you take that into account if you really think we're in this world of very low rates? Then that obviously changes your view about what interest rates should be relative to the SEP.

But the second issue is the term premium itself. In our earlier discussion today, I think we kind of came around to realizing that we're probably going to have a big balance sheet for a long time despite our earlier public statements that we're going to normalize the balance sheet. So that could be an argument for a low term premium for a very long time. In addition, I think there's a growing recognition that the pricing of risk in the Treasury securities market has changed fundamentally from the 1980s and 1990s, when the risk you were protecting against was high inflation. The market seems to be, at least based on what I've seen, pricing the downside scenario in terms of what you're really worried about. And that is just going to push the term premium associated with a 10-year Treasury security from a high positive value to a potentially very low positive value or even a negative value.

Getting back to President Lacker's question: How do you take into account both a very low r^* and, probably because of a low r^* , a shift in the equilibrium term premium when you do this kind of assessment?

MR. PALUMBO. As best we can.

MR. WILLIAMS. Okay.

MR. PALUMBO. We're thinking about things very much the way that you are. As I mentioned a second ago, over time, in the Tealbook baseline outlook, we've both lowered not just the r^* in the forecast—which we've taken down, as you know, quite a bit—but we've also materially lowered where we think the term premium will end up over the long term, though it's still well above where it is now. We've also flattened out the trajectory. We've elongated the time it will take for today's term premium to migrate toward whatever we think its long-run equilibrium would be. We did that all in the context of recognizing that the pricing is different,

that the global equilibrium rates around the world are lower, and that's going to have very persistent consequences. So we've factored that in as best we can.

MR. WILLIAMS. Yes, but by implication, if I do the subtraction of the colors—if I can do this in my head—the Treasury securities are red, right?

MR. PALUMBO. Well, maybe. [Laughter] I wouldn't necessarily put it that way. It depends. I think we have people on the team who would say that longer-term Treasury yields could stay where they are today and stock prices could fall 15 percent over the next seven months if the economy evolves the way we think it will—if there are no surprises—just because the valuations that are implicit in today's prices will prove to be unsustainable by themselves. Again, that's not everybody on the team, it's the position of people I respect. I don't think it's a ridiculous place to be, I guess. It's not like it's only those people. You read about that in other spheres as well.

CHAIR YELLEN. Thomas.

MR. LAUBACH. Perhaps merely to add the detail that, of course, we think that part of the low term premium is thanks to the large asset holdings. Right now, for example, the Kim-Wright model, which is informed by survey expectations as best as we can tell, is at about negative 50 basis points. We think that the current effect of the balance sheet is about in the range of 85 basis points. That would get you to an adjusted level of about 35 basis points. Certainly, that's still low by historical standards, but as you point out, it might reflect a different perception of the hedging properties of long-term nominal safe assets.

CHAIR YELLEN. Governor Fischer.

MR. FISCHER. Just two questions. First, why do you show the level of debt on a ratio scale? What happens if you show debt service? Doesn't everything look very different?

MR. PALUMBO. Yes, debt service does look very different. The debt service ratio for households is basically lower than it was between 1980 and 2013. I guess one reason we do it this way is that in 2006, the debt service ratio was also not looking particularly high, and so we think that—especially when you think about it in terms of originations—it’s also useful to track just the overall positions of households. Again, we do both, typically.

MR. FISCHER. Yes. You said it’s also useful to track the overall positions, but the ones with the income are not shown.

MR. PALUMBO. Right. It’s hard for us to do income, because the data that we’re showing here are the credit-records data. And, unfortunately, we get to see a lot about debt, but we don’t get to see much about income. In these data, we don’t even get to see much about payments or risk—only a little bit about payments.

But the point I was trying to make here is a different one, which is that even insofar as we do see real increases in debt owed by households, it’s accruing to these households who have, in the data, virtually no delinquency rates or default rates. It’s just a way to characterize, again, the overall likelihood of the sustainability of those balance sheet positions. That’s the only thing I was trying to do there.

MR. FISCHER. And the second question: Was it intentional that you showed “adjusted for Treasuries” in the national colors of Brazil? [Laughter]

MR. PALUMBO. No. If you look at the legend, which is in probably a 4.5-point font beneath that table, you can see what we were trying to do is gauge where they were located in the historical distribution.

MR. TARULLO. He’s just giving you a hard time.

MR. PALUMBO. I know.

CHAIR YELLEN. President Lockhart.

MR. LOCKHART. I'd like to return to the top of exhibit 2 and the color chart and ask about the equity ratio valuation. I've been reading recently about growing concern over the changing structure of equity markets with exchange-traded funds and other aggregations of equities that are perhaps more vulnerable to runs. Two things are going on: Exchange-traded funds are growing and the, let's say, in the battle between passive and active management, passive is winning. Both suggest that in a really bad market, very disruptive runs could occur. Is that factored into your valuation here or is this just a P/E ratio effect?

MR. PALUMBO. Here, this is just a P/E ratio. Now, again, when we're thinking more broadly about the valuation pressures in the domestic equity markets, we do take a much broader view, and we certainly would entertain the possibility that changes in the microstructure of the markets were either reducing or adding to pressures beyond what we would see in our traditional or historical metric. So that's part of the perspective that we take.

I think, though, it's fair to say that in the U.S. broad stock markets today, I haven't heard people really emphasizing that the active versus the passive investors are particularly causing trouble evaluating the resilience of prices. And I guess I don't know much about the exchange-traded funds, but I have colleagues that do. Some people like the exchange traded fund as an instrument. It depends on how these—what are the dealers called in the ETFs?

MS. LIANG. “Authorized participants.”

MR. PALUMBO. Authorized participants. It depends on how they're going to behave in a period of stress, but in principle, investors can't just pull their money out of those funds the way they can out of an open-ended long-term mutual fund. So there's a sense in which they may

have more robustness than the long-term mutual fund model. We've thought about that a lot in the context of loan funds and bond funds, but it could even be true in equity funds in principle.

CHAIR YELLEN. President Evans.

MR. EVANS. Thank you, Madam Chair. Is it okay to ask questions on the economic situation? [Laughter]

CHAIR YELLEN. Go ahead.

MR. EVANS. It's a question for Eric about inflation expectations on exhibit 11. We had taken note of the fact that, as you pointed out, the Michigan survey had dropped down to a historical low for inflation expectations, and then you did the trend-augmented calculation, taking into account food and energy inflation. So I was staring at that for a little while, and I guess I have a question and an observation. My question is whether or not the shaded region corresponds to the same type of uncertainty as it does for the other data. The observation is, as I stared at it, that the other times the green line had sort of touched down on the bottom were both periods when the FOMC was either adding a lot of accommodation or had just recently added accommodation. One was August 2003, when we did forward guidance by saying it'll be a considerable period of time before we increase the funds rate. The other one looks like it was the fall of 2012 when we started the open-ended asset purchases, QE3. So as we're on the downward slope here and perhaps haven't touched bottom on that green line, I wonder if the circumstances aren't a little bit different than just "it's within the normal historical experience."

MR. ENGEN. Yes. The gray shaded region is the 70 percent range for just the historical observations, unadjusted for anything, and so the green line being in that range is just an observation. All the green line controls for, other than estimating a simple trend, is essentially movements in food and energy prices both contemporaneous and 12 months previous and

24 months previous. That's the lag structure. And the estimated coefficients on these variables are all significant. The coefficients on both the contemporaneous and the 12-month lags are of roughly equal size. So that lag structure does seem to matter. You raise a possibility that there may be something else in there. We haven't looked at that, but at least sort of walking through some of the history could be something we could consider to see if it does further explain the trend.

Now, it's also going to be the case that, looking ahead, if we do get the rise in food and energy prices that's in the forecast, this measure should be kind of bottoming out and then moving up, if that's what's going on here.

MR. EVANS. Right. The way you did the presentation, I might have had the takeaway that looks like this is not that unusual, but recognizing those two episodes, I wonder about that. Sounds like it's up for grabs, at least.

MR. ENGEN. Yes, point well taken.

CHAIR YELLEN. Any other questions? [No response] Okay. We now have an opportunity for people to comment, if they'd like, on financial-stability issues, and a few of you have indicated your desire to do so. Let's start with President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. My comments on financial stability usually highlight increased risks to financial stability. Today I wanted to highlight that one risk associated with the shadow banking system has clearly declined, as was mentioned in the Tealbook and the presentations we just heard. The recent trillion-dollar movement out of prime money market funds into government-only money market funds represents a relatively rare instance in which we have been successful in intentionally reducing risk in the shadow banking system.

Prime money market funds were a source of great instability during the financial crisis. The promise of a fixed NAV on a fund for which investments for a significant credit duration risk turned out to be a promise they could not necessarily keep, especially in the wake of Lehman's failure. A very substantial movement into government funds as a result of regulatory changes to prime money market funds should give us some hope that, with sufficient perseverance, we will be able to identify other significant areas of instability in the shadow banking system, discuss them publicly, and get them changed. Thank you.

CHAIR YELLEN. Vice Chairman.

VICE CHAIRMAN DUDLEY. I just want to make a few comments on one of the risks that's already been highlighted by several different people on the staff, which is Deutsche Bank. As I see it, there are multiple problems here: a bad business model, poor execution, undercapitalization, and multiple legal cases that will result in large fines that will certainly put even greater pressure on the bank's capital. And the situation is made worse because of the lack of visibility about when the legal cases will be settled and the amount of fines that will ultimately be assessed.

The firm is apparently waiting to settle its RMBS case with the Department of Justice before unveiling its new strategy, which apparently is going to be to shrink to a smaller, more reasonable footprint supplemented by a large equity capital raise. But the problem is that, in the meantime, the franchise is eroding, which undercuts the firm's future profitability prospects. This also makes it more difficult for the firm to raise the necessary equity to shore up its balance sheet. I think someone remarked that it's selling at 0.3 times book value currently. So the firm is very fragile, and even though it announced its earnings last week and nothing really bad happened, the risk of an abrupt loss of confidence seems to still be very, very high. I remember

the summer of 2008 when there were weeks and months when there were firms that looked okay. That didn't mean that they turned out to be okay.

Now, one might argue that the German government will not let Deutsche Bank fail because it is their largest bank, and that could be correct, but I think it does ignore two constraints, one political and one legal. The political constraint is that a German government bailout of Deutsche Bank would be very unpopular politically, and that's particularly relevant in the current environment, in light of the upcoming German election and the fact that Angela Merkel's popularity is already somewhat diminished. The German government has said they will not do a recap, but it's unclear what their appetite would be if there was actually no alternative. The legal constraint is the European Union's bank competition policy, which sharply constrains the ability of national governments to recapitalize, as opposed to resolve, their troubled institutions. In a resolution, bank debt has to be built in, which means large losses for investors and a heightened risk of contagion. So they're in a difficult place.

Although the financial system is a lot stronger today than it was in 2008, I believe that the failure of a firm the size and complexity of Deutsche Bank would have significant consequences for the stability of the global financial system. Deutsche Bank has a huge derivatives book, and a significant portion of this book is still cleared on a bilateral rather than centrally settled basis. Moreover, the risk of failure really isn't priced in to any significant degree, although Deutsche Bank's five-year CDS is elevated relative to other institutions. It's only trading in a range of 200 to 250 basis points, which is far lower than a number of institutions that actually did not fail during the 2008 financial crisis. So I think that if Deutsche Bank did fail, it would be a pretty big surprise, and so the shock would be even more intensified. I also don't think it would be viewed as a purely idiosyncratic event, because there are other firms that are challenged in terms of

profitability, business model, and uncertain legal liabilities, including banks like Credit Suisse and Barclays. Now, on the positive side, I think those firms have some core businesses that are well functioning and actually do have fundamentally stronger franchises, but I have little doubt that if Deutsche Bank failed, it would put significant pressure on several other major banking institutions.

Of course, what's frustrating about all of this is, what do we do about it sitting here in the United States? Well, there's not much we can do but to ensure that Deutsche Bank has sufficient liquidity in the United States so there is no late-day funding shortfall, and to press Deutsche Bank and the ECB, which is its supervisor, to have Deutsche Bank settle its RMBS case with the Department of Justice as swiftly as possible. Settlement of the case, I think, would be important, because it would encourage Deutsche Bank to then go forward and announce its new strategy, quickly followed by a raising of capital. And I think if those two things could happen, we might be in a somewhat better place. But where we're sitting today is not something that makes me very confident. Thank you.

CHAIR YELLEN. Thank you. Governor Fischer.

MR. FISCHER. Thanks.

MR. KAPLAN. Could I ask a question?

MR. FISCHER. There is a two-hander there.

CHAIR YELLEN. Oh. Yes, President Kaplan.

MR. KAPLAN. This discussion begs the obvious question, which I guess I'll just ask. I am familiar with the bank, and it does have profitability. And, although there are other issues, the accelerant to this is a \$14 billion fine for a \$13 billion-less-market-cash company.

VICE CHAIRMAN DUDLEY. That is just the Department of Justice's opening offer. That doesn't mean that's where it will end up.

MR. KAPLAN. But it has created substantial instability because of the uncertainty about where they are ultimately going to settle. What I'm asking is—although I guess you may not agree with that premise—if that were true, what could we do? Is there something that should be discussed so we don't manufacture a crisis?

VICE CHAIRMAN DUDLEY. No, I don't think there is anything for us to do, in that sense. The Department of Justice has to do what it has to do, and I don't think there is any role for us.

MR. KAPLAN. Okay. There is the case, then there is the amount of the fine, and then there is the way it is being negotiated. Even though the ultimate negotiation may ultimately wind up being a far smaller number, the headline will do a lot of damage.

VICE CHAIRMAN DUDLEY. The problem here is lack of clarity. The lack of clarity means that people have no visibility about when it will be resolved. And in the meantime, the franchise value of this company is eroding because of the wide level of uncertainty

MR. KAPLAN. I know. I watch it every day.

VICE CHAIRMAN DUDLEY. So you can argue that there is some sort of combination of size of settlement and speed of settlement that are both probably relevant here.

CHAIR YELLEN. Nellie.

MS. LIANG. I just wanted to add that Deutsche Bank has been an ongoing issue for most of this year. It wasn't just this settlement. I think its stock price fell about 50 percent in January, and it has not recovered. So it has got a thin capital cushion. It is not only the DOJ.

VICE CHAIRMAN DUDLEY. And there are other cases besides the current RMBS case that are relevant here, which makes it even more complicated.

CHAIR YELLEN. Governor Fischer.

MR. FISCHER. Thank you, Madam Chair. The quantity of QS that has been presented by the Financial Stability Division is really very good, and it raises a lot of questions and answers a lot of questions. Let me say a few words first about the IFSM, the International Financial Stability Matrix, which extends the assessment of the Financial Stability Division to 12 foreign countries and produces a very colorful quilt for us to look at. It is extremely ambitious. It is a lot of work, but there is one big reason you want to know about other countries, and that is how the system as a whole will work and what the dynamics of the system will be. And that's a whole other level of difficulty in looking at this. And you might ask at some point whether you actually need to have 13 countries in this system of equations or whether you can manage with fewer. But it's a very ambitious, very bold, and, at this stage, very interesting piece of work. Congratulations.

Then the first part is the regular QS of the U.S. financial system, which starts with Deutsche Bank. So I am going to say a few things related to what Vice Chairman Dudley just said, which is, so far, nothing seems to be happening in the standoff between the Department of Justice and Deutsche Bank. I suppose you could call this a phony war, but I also suppose that actually there is a lot going on in the background. One of the things we do know is that if the dynamics that the staff has looked at continue, then Deutsche Bank would find itself, after eight weeks, with very little left in the way of liquidity. Well, what happens then? Either Deutsche Bank is rescued from bankruptcy or from the hands of the regulators in some fashion, or the

international system—and that means especially the European financial system—faces a very difficult situation.

Now, I don't know the inside details to the extent that Vice Chairman Dudley probably does, but it's standard in games of chicken—and this is one of them—that there is a lengthy period of confrontation, but they end. How will it end? We don't know. We are dealing with a German government that was thought to be playing a game of chicken with Greece and didn't actually blink very much in that entire process. And it is trying to set an example for the rest of Europe, but it is not going to want Deutsche Bank to go broke. So it is going to be a very interesting and a very closely run thing. And one of the troubles with a game of chicken is that, occasionally, neither side withdraws, and then you get a crash. And I don't know, and don't think any of us can know, what is going to happen.

There is a very good box later in the paper on how Deutsche Bank's problems would affect us, and it ends on a sober note, which I think actually is the note that was read to us earlier, which says that holding bank capitalization and the intensity of regulation constant, all these factors—and I will tell you what they are in a moment—should make the equity and subordinated debt of a large bank appear substantially riskier now than before the crisis. What are these factors? Well, we now know that house prices can drop at the national level, and they did drop 25 percent. We also know that financial crises can happen more than once. And, finally—this is a very delicate way that you put it—the support for too-big-to-fail policies might have weakened considerably. So it is a different situation, and much of history is not entirely relevant. And I don't think we know very much about what is going to happen, and we probably all have the feeling that President Kaplan has, but we don't interfere in the Department of Justice, and we hope they don't interfere here, and that's it.

The matrix on exhibit 3, which we have talked about a little bit, shows considerable stability. In the last year, there have been only two changes in color, and they might amount to only one and a half changes. But both are improvements, so the last year has been good for the financial stability of the United States. The overall assessment over the year has been steady. The bottom line, the one that is all yellow, says that the level of vulnerability of the U.S. financial system is moderate, which is a good level, because if it was much better, we would have to begin worrying about complacency. [Laughter] But I doubt that that is what will happen with Nellie's troops, even after she has gone.

Another few comments. The reform of the prime money market funds seems to have gone very well, and congratulations to all involved, many of them in this room. Second, on valuation pressures—this is a very complicated section of the report, and we have had some discussion of the complications already. The report says valuation pressures are moderate. It says estimates of expected Treasury security yields are more or less in line with past experience, which surprised me. But it then says that, even so, a risk that a sharp rise in interest rates not driven by improving economic conditions could trigger broad declines in asset prices. And that is a question I think, again, that we have all been asking ourselves.

We know we reduced the interest rate to get asset prices up. We assumed, at least I assumed, that as the economy improved, we would just move into a situation with a higher interest rate, which justified, more or less, the higher level to which prices have gotten. But we haven't seen the economy improving to that extent, and so I suppose that is what is being said. If we get into a situation in which interest rates rise for a reason not driven by improving economic conditions, we are going to be in a difficult situation. Nonetheless, the bottom line is, broad indicators of household solvency have remained within historical norms.

Now, just four concluding comments. One was almost said by President Rosengren. There isn't a whole lot on the shadow banking system.

Second, the task of a monitoring agency is a very difficult one. If you keep on monitoring and your brilliant interventions prevent anything happening, no one knows unless you go out and boast about it, but you shouldn't. But if you keep on monitoring and a crisis occurs, everyone knows, and that's why it is difficult. The equilibrium of this process, however, is likely to result in an excess of crises called over the number that actually occur, and that actually may be an optimal outcome.

Third, in evaluating financial stability, we should presumably also try to describe what is likely to happen in the way of damages and in the way of policies to mitigate the resultant crises. We could ask the FS Division to do one or two case studies of how a crisis would be dealt with, and it is very close to what you did in the case of Deutsche Bank in the box. And that was not a comforting analysis, and we might find that about other potential crises.

Fourth and finally, as the Chair announced, this is Nellie's last FOMC meeting. Nellie, you will leave the Federal Reserve with the gratitude of those with whom you have worked over the past 30 years, and with the gratitude of some with whom you have worked only over the last 2 years. And you will end your service at the Fed having transformed a small office into a mighty Division of Financial Stability. When someone asks the Chair how many economic divisions she has [laughter], she can say, "Thirty-three percent more than I had last year." And she will add, "And it's a damn good division, too." We thank you for everything you have done, Nellie, together with your colleagues in the FS Division and in cooperation with other divisions. You have done it extraordinarily well. Good luck as you move on. We will miss you.

MS. LIANG. Thank you very much.

CHAIR YELLEN. Okay. I think we're ready now to go into our round on economic comments. And our first speaker is President Williams.

MR. WILLIAMS. All right. I'm losing half my audience. Thank you, Madam Chair. Real GDP growth in the third quarter was strong. The economy grew almost twice as fast as my estimate of its sustainable trend, which is about 1½ percent. Of course, we have to remember that the quarterly numbers can be volatile, and they're subject to one-off transitory factors such as the spike in soybean exports and residual seasonality.

Now, in the past, some people, including my good friend who sits here to my right, have claimed that I only talk about seasonal adjustment problems when the real GDP number is weak. So to prove him wrong, let me wade back into the weeds of residual seasonality one more time when residual seasonality is, in fact, likely giving us an overly optimistic read on the economy. Just to recall, the main problem is that, on average, first-quarter real GDP growth has been weaker than growth in other quarters even after seasonal adjustment. In fact, this seems to reflect the BEA's bottom-up methodology, which seasonally adjusts the individual subcomponents instead of the aggregate number directly. But small amounts of seasonal variation at the granular level when aggregated can affect the top-line GDP numbers.

In the past, to correct for this residual seasonality, my staff has applied a second line of seasonal adjustment to the published aggregates, taking, in effect, a top-down approach. Recently, the BEA has taken some steps to reduce residual seasonality, and in this summer's annual revision, it implemented several improvements to its seasonal adjustment methodology. That creates a little bit of a problem, because in that annual revision, the BEA only provided us with three and a half years of historical data using these new procedures, and that short sample means it's hard to calculate a precise magnitude of any remaining residual seasonality. And,

furthermore, a complete sample of the consistently revised GDP data won't be available until 2018 when we get the next comprehensive NIPA revision. So until then, I won't go so far as to say that we're flying blind on this important issue, but our windshield is still fogged up.

In view of the likelihood of some remaining residual seasonality, it seems appropriate to focus even more on the four-quarter growth rates of real GDP and prices. And on that basis, both real GDP growth and core PCE inflation appear likely to be around $1\frac{3}{4}$ percent this year, which is in line with the September SEP—that is, on balance, the recent data have been consistent with our expectations.

Of course, much of the economic and policy discussions focus on the balance of risks associated with the forecast and the management of those risks. One risk that has been highlighted in the Tealbook and in the presentation today is that future interest rate hikes and the associated divergence in global monetary policies may cause an appreciation of the dollar. For example, the Tealbook currently expects the dollar to rise almost 5 percent over the next couple of years as market participants' expectations of FOMC rate actions are revised up. Underlying this projection, the Tealbook assumes that each 100 basis point funds rate surprise leads to a 3 percent appreciation in the dollar. This effect—the “bang for the buck,” if you will—is based on recent dollar responses that are somewhat larger than historical averages.

In looking into this issue, my staff investigated the robustness of the estimated dollar response across several different specifications to get a sense of how much larger or smaller it could be. And while the dollar has shown greater sensitivity to interest rate movements since 2014, overall, this change isn't statistically significant one account is taken of the wide empirical confidence intervals surrounding these estimates. Of course, these wide confidence intervals also imply that there is a risk that the exchange value of the dollar may appreciate even more

than assumed in the Tealbook. But I don't lose too much sleep over this risk, because it can be fairly easily mitigated by an adjustment in the path of policy. For example, if we raise interest rates a bit and we see a larger-than-expected rise in the dollar, we can offset this jump by postponing future funds rate increases appropriately. We don't need to let risk-management caution turn into paralysis.

And it's important to see the risks on both sides. There are downside risks to inflation from an outsized appreciation in the dollar, but there are also notable upside risks. The divergence between the PCE and CPI inflation rates may get resolved in favor of the CPI. That may happen, for example, if the unusually weak PCE health-care price inflation starts to rise next year. Also, there's no question that wage growth is picking up. If you look at the apples-to-apples measure like the Atlanta Fed Wage Growth Tracker, that's been increasing, but other labor cost measures are firming somewhat as well. And if these upside risks play out, inflation could easily overshoot our 2 percent target next year. I don't think that would be such a big problem, because in that case, monetary policy should be positioned to shift to a much less accommodative stance.

For the real economy, the risks look fairly balanced. While the improvement in labor force participation this year has bought us some time, I see a low probability of a repeat performance next year. So it seems more likely that job gains will outpace labor force growth, and the unemployment rate will go back to edging down to somewhere between $4\frac{1}{2}$ and $4\frac{3}{4}$ percent.

To sum up, the economic expansion looks like it's on track. The labor market is strong and shows solid momentum, inflation is moving back toward our 2 percent goal, and we're well positioned for a gradual increase in interest rates. Thank you.

CHAIR YELLEN. Thank you. President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. I expect the economy will likely reach 2 percent core PCE inflation and my estimate of full employment, which is 4.7 percent, sometime next year. Achievement of both parts of our mandate in 2017 is likely, conditional on my forecast of continued above-potential economic growth over the next couple of years. We are already relatively close to full employment, and with projected output growth above potential next year, we may well see the unemployment rate continue to decline gradually, although this, of course, depends on the evolution of labor force participation, a topic to which I will now turn.

One reason to be skeptical that labor markets will tighten further might be the constancy of the unemployment rate over the course of this year. Of course, a relatively flat unemployment rate, despite reasonably strong payroll employment growth, is a good sign for the economy, as it implies that the labor force has grown strongly over the past year. However, there is reason to believe that this good news on labor force growth is unlikely to persist too far into the future. At the Boston Federal Reserve conference last month, papers by Robert Hall and Alan Krueger each emphasized important secular trends in labor force participation. In particular, the paper by Krueger suggests that the scope for further increases in labor force participation may be limited by the fact that a large portion of the working-age male population currently out of the labor force reports having a serious health condition that is a barrier to work.

It is also worth noting that while the recent increase in labor force participation can be interpreted as evidence of slack in the labor market, participation does feature a cyclical component. From a cyclical perspective, the rise in labor force participation, rather than a sign of slack, could well be taken as a sign of a labor market that is nearing full employment. While I hope that the recent increase in labor force participation at this juncture of the business cycle will

prove persistent, it is also important to be mindful that the historical experience in the United States is not especially supportive of such a view. Work by my staff indicates that workers entering the labor force at age 25 or older in a good labor market do not exhibit a significantly higher permanence, measured over a 12-year span, in the labor force than similar workers entering the labor market at other stages of the business cycle.

In all, we should not be overly confident that output growth above potential will continue to entice new entrants into the labor force, nor that those who enter will remain for long. With the aging of the baby boom and its entrance into retirement, along with the limited evidence that labor force growth is likely to continue, I expect that output growth above its potential rate will result in a gradual decline in the unemployment rate.

Turning to potential signals of labor market tightness, evidence suggests that both wages and prices seem to be gradually rising. Core PCE prices over the past year have risen 1.7 percent. If, in fact, we reach 2 percent inflation by next year, it will likely have an effect on financial market prices and the relative stability we have enjoyed over the past year. The Tealbook is forecasting a fairly gradual rise in the 10-year Treasury rate. While I hope that is the outcome, I am worried that the long rate response may be more unruly than the Tealbook envisions as markets realize that their assumed funds rate path is inconsistent with having achieved our dual mandate, with the prospect of further labor market tightening still to come.

In sum, we are currently quite close to achieving our dual mandate. Both my forecast and that in the Tealbook expect the unemployment rate to undershoot the natural rate. Our ability to pursue a path of gradual tightening will be dependent on when we resume raising rates.

Tomorrow I will discuss in more detail why delaying too long could be costly. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Tarullo.

MR. TARULLO. Thank you, Madam Chair. I think everyone shares the intuition that monetary policy operates with a lag, although I would note, in passing, that this means that a central bank may keep tightening for too long as well as that it may wait too long to begin tightening. But saying we shouldn't wait too long is almost tautological and not particularly helpful in deciding when to move.

There have been suggestions in some quarters going back several years or more about the existence of lags, arguing for raising rates relatively soon after the suggestion was made. And, of course, many more people have been voicing this view in the past year or so. I certainly didn't find this view convincing two or three or four years ago. But as I mentioned at our previous meeting, although I haven't yet been persuaded—and, thus, I haven't been in favor of incurring the costs of the marginal jobs and economic growth that would not be realized with another rate hike taking place sooner rather than later—I have found the case a closer one over the past few meetings.

Because not moving won't be the right position forever, except perhaps if secular stagnation has gripped the economy with a vengeance, I have tried to define for myself with a little more specificity when the intuition of a preemptive move should click in. There doesn't seem to be a consensus answer to the question of how long the implementation lag may be. I've seen everything from three months to two years, with relatively more views in the two-to-three-quarter range. And I should note that, if one's concern is financial stability, the implementation lag may be a good bit shorter than that affecting real economic activity. And, of course, the length of the implementation lag isn't the only important question. Also important are the relative degree of certainty that conditions are emerging that will recommend a monetary policy

response and the relative magnitude of the risks associated with dealing with possible adverse outcomes that suggest *ex post* it would have been better to have followed the policy road not taken. While I suppose the implementation lag may have changed even in the past year or so, I think it would be very difficult to determine with any certainty whether that's been the case. And I don't think that what I've regarded as the asymmetric balance of risks or the relevance of a low r^* that may remain low indefinitely have changed materially in recent months.

In examining whether my own position should change, I focused mostly on the questions of the relative degree of confidence that conditions will emerge, counseling a rate increase, and the relative magnitude of risks associated with possible adverse outcomes in both directions. I'm not going to repeat my self-described pragmatic view, which you've all probably heard plenty of times. But let me mention a few developments that have affected my assessment as to whether we are closer to the point at which a failure to remove more accommodation would begin to carry sufficiently high risks that it is worth the admittedly hard-to-quantify opportunity costs of some number of additional jobs being created.

On the labor market front, I continue to believe there is more slack—that is, that the trend of the past year or more of job creation well above the number of new entrants with an essentially flat unemployment rate can continue. Again, though, this view won't be right forever. And even though the flat Phillips curve means that the pass-through from potentially increased nominal wage growth to price inflation is not all that direct, I think nearly everyone agrees that, directionally at least, there is some correlation. So I've been watching for some indication in the data that this trend may be nearing its end. I don't think there's too much in wage patterns yet. Here, not much has changed in the past year. There is one measure suggesting we have begun to see some increased distance between industries in which wages are

growing faster and those in which they are not—something that, in the past, has been correlated with later acceleration across the board. But this is the measure based on three-digit industry codes, and even then it's not that significant a move. The more granular four-digit industry code measure shows no change at all.

Our labor economists did, however, point out something that might prove to be a harbinger of the end of the aforementioned trend. At the height of past business cycles, the labor force participation rate has increased somewhat above its trend but, with the exception of the halcyon period of very high growth in the late 1990s, not for more than a couple of quarters. Under the staff's current estimate of trend labor force participation, actual labor force participation has, for the first time since the financial crisis, exceeded the trend, albeit by a very small margin. Now, I think the staff would agree that we shouldn't have a high degree of confidence in current estimates of trend, as they have debated it so much among themselves. If it's actually higher than the staff estimate, which does fall below some other estimates I've seen, then we're still not back to trend. And the fact that we have been below trend for so long—nearly eight years—may mean that past correlations won't hold up in current circumstances. But it is something I'll be watching.

Another thing I want to note in passing—and I think people have commented on this before, but it's something we should probably keep in mind—is that the change in the labor force participation rate, contrary to the instinct I think we all have, is not principally due to a lot more people being pulled back into the labor force. It's actually due to people making decisions not to leave the labor force in greater numbers than they had previously—I guess it's a double positive—which may affect our sense of the future trend, particularly when you're talking about

people who are hitting an age that, in the past, has been a retirement age—that is, it may be a little bit more sustainable.

With respect to inflation, I've been focused on seeing some tangible developments on the inflation front that would credibly promise nontransitory attainment of the inflation target, with due consideration to the symmetrical nature of that target. It does seem as though the disinflationary effects of the stronger dollar and energy prices are waning, though it's less clear whether the dollar is done strengthening. And the recent core inflation reading has come in a little higher than anticipated, I gather reflecting, in part, slightly larger effects from now-rising energy prices and some nonmarket services components. I don't place an enormous amount of weight on such a modest change, particularly any that is attributable to those pesky nonmarket components, but now, at least, the uncertainty with respect to inflation's path is a little more tilted in an upward direction.

To conclude, as you can tell, I find the situation to have considerably more nuance than was the case just six months ago. I don't find the case for another increase yet to be compelling and certainly not urgent, in view of the still mixed nature of incoming data. Moreover, I don't think there should be concern about some overshooting of the 2 percent target, something that could actually have favorable medium-term effects. But I do find it arguable that we're getting to the point at which some further modest, cautious removal of accommodation may be a reasonable response to the continuing diminution of slack in the economy and the labor market. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Mester.

MS. MESTER. Thank you, Madam Chair. Overall, there's been very little change in the moderate growth picture of the Fourth District economy since our previous meeting. District

contacts report largely stable economic conditions. The Bank's diffusion index of business contacts reporting better versus worse conditions edged down to minus 6 from minus 4 at the time of our previous meeting. Manufacturing remained weak, but contacts in the energy sector reported a pickup in activity. Retailers reported a slowdown in activity, but many cited ongoing pressures associated with the transformation of the sector from bricks and mortar to online sales rather than a drop in overall demand. As has been true for some time, labor market conditions in the District remain healthy. The Federal Reserve Bank of Cleveland staff estimates that year-over-year growth in District payrolls was 1 percent in September, essentially the same pace as seen over the past five months. The District's unemployment rate has remained low and stable at 5 percent all year. District contacts continue to report increasing upward wage pressures, particularly for relatively low-skilled positions, over the past few months.

A national labor leader who is on our Cincinnati Branch board noted that a very high volume of union contracts are being renegotiated this year. He reports that the negotiations involving his organization have gone relatively smoothly, with average wage increases of 3 to 4 percent. He also noted that there's a growing sentiment among companies that they must invest in workforce development at the entry level and upgrade skills of experienced workers. In fact, several of our directors have reported that they're allocating additional resources for worker training and apprenticeships aimed at strengthening their staffing pipeline.

On the inflation front, overall, District firms report that prices received and nonlabor costs continue to rise but at a somewhat slower pace than in September.

Turning to the national economy, overall, my outlook for the U.S. economy over the medium run is unchanged since our previous meeting. I expect output growth to be at or slightly above trend, the unemployment rate to fall below its longer-run rate, and inflation to continue to

rise gradually toward our longer-run objective of 2 percent. In my view, the incoming data have been supportive of this projection.

Output growth picked up in the third quarter from its weaker first-half pace. The pattern of growth was about as expected. Consumer spending remains solid, but nonresidential investment remains weak. I continue to anticipate some pickup in investment as the expansion continues. Oil drilling activity is rising in response to higher oil prices, and low corporate bond spreads are supportive of increased investment spending. A stronger pace of capital deepening would help boost labor productivity growth from recent low levels.

Labor markets continue to improve. A broad set of indicators are consistent with labor market strength. Since the start of the year, monthly gains in payroll employment have averaged nearly 180,000 jobs, a pace well above trend. The unemployment rate has been relatively stable at estimates of its longer-run level. Measures of underutilization have decreased, the labor force participation rate has edged up, and average hourly earnings and other measures of wages have accelerated somewhat. My view, like the Tealbook's, is that we are essentially at full employment from the standpoint of what monetary policy can do.

With respect to the other part of our dual mandate, I view incoming data as consistent with the Committee's anticipation that inflation would begin to rise as the transitory effects of past declines in energy and import prices dissipate. Oil and gasoline prices have risen back to their levels of a year ago, and nonpetroleum import prices have moved up over the past six months and are now less than 1 percent below year-ago levels. As a result, year-over-year PCE inflation is now 1¼ percent, 1 percentage point above its level from a year ago. Over the past six months, PCE inflation has risen at an annual pace of slightly more than 2 percent. Core inflation measures have been stable to up slightly over the past several months and are above

year-ago levels. Core PCE inflation, measured year over year, is now 1.7 percent, up from 1.4 percent a year ago. The Dallas Federal Reserve trimmed mean inflation rate is also running at 1.7 percent, up slightly from a year ago. Core CPI inflation has been slightly over 2 percent all year. The Cleveland Federal Reserve median CPI measure has been at or above 2½ percent for the past five months. The Cleveland Federal Reserve staff's near-term inflation model is forecasting inflation to rise for the remainder of the year, closing in on the 2 percent objective. In December, the model predicts year-over-year PCE inflation to be 1.7 percent, a significant increase from the current level, and core PCE inflation to be 1.9 percent. Admittedly, there is a fairly wide confidence band around these point forecasts, but the rise being predicted is consistent with what the FOMC has been anticipating.

In my view, inflation expectations remain reasonably stable. Our Reserve Bank's 10-year and 5-year, 5-year-forward measures have been stable. The 5-year, 5-year-forward breakeven rates moved up a bit since the previous meeting, but we have to be cautious in reading too much into this, as the move may have reflected changes in liquidity and inflation risk premiums rather than inflation expectations. The University of Michigan survey measure of inflation expectations over the next 5-to-10 years fell in October to a record low of 2.3 percent, but as I discussed at our previous meeting, this measure has been trending down since 2013, and the distribution in responses has been changing as well, with fewer respondents reporting expected inflation rates at 5 percent and at 10 percent. The downward movement in the Michigan survey bears watching and further investigation, but at this point I'm not taking a strong signal from it. So I anticipate inflation will gradually return to our 2 percent goal over the next couple of years as the drag due to earlier declines in oil prices and the appreciation of the

dollar pass through. Output growth continues to be at or slightly above trend, labor markets continue to be healthy, and inflation expectations remain stable.

I continue to project that a gradual upward path of interest rates over the forecast horizon will be appropriate in view of my outlook and the risks associated with it. I see those risks as broadly balanced at this time. However, failure to move interest rates up gradually from the current low level will increase the risks over time. These risks include risks to financial stability from search-for-yield behavior and potential asset price bubbles. The staff's QS report suggests that commercial real estate prices continue to rise and are somewhat overvalued in some markets. The risks also include risks to macroeconomic stability from potentially getting "behind the curve," generating excessive inflation, and then having to take more aggressive action than currently anticipated, which would shorten the expansion.

Some private-sector economists who see the macro risks as low at this point have been advocating that until inflation moves up to or above our goal, the FOMC should run the economy "hot" in order to bring more people into the labor force and drive down the unemployment rate further, perhaps even lowering the structural unemployment rate. First, setting aside the risks, it isn't clear that that strategy would work. The historical data suggest that labor force participation is not very cyclical. In addition, running the unemployment rate well below its natural rate would entail supply-side costs—for example, inefficient matching that could lower productivity growth. In a typical DSGE model, these costs are reflected in the welfare-based loss function, which is well approximated by the familiar quadratic loss function that penalizes both positive and negative deviations of inflation from its target and of unemployment from its natural rate.

Second, history tells us that this “hot economy strategy” is quite risky. Now, if we could rely on the Phillips curve remaining flat and inflation expectations remaining anchored, then the risk of engendering excessive inflation following this strategy would be relatively low. We might expect outcomes like in the first alternative scenario in the Tealbook. But what if the Phillips curve turns out not to remain linear and flat so that as the unemployment rate falls further, wage growth picks up significantly and inflation expectations don’t remain anchored? Then the cost of this hot economy strategy could be very high. We could find ourselves well “behind the curve” because of our deliberate actions and then have to take aggressive action in response to bring inflation down. We risk turning the hot economy strategy into a cold economy strategy if we end up in a recession. The second alternative scenario in the Tealbook captures part of this possibility, but it’s more benign because inflation expectations remain anchored. Even so, that scenario ends up with inflation above our goal and the unemployment rate eventually higher than in the baseline.

Third, the discussion at the March 2004 FOMC meeting echoes some of our recent discussions. At that point in time, interest rates had been on hold at 1 percent for some time, and some on the Committee believed low inflation and economic slack meant that the costs if economic growth turned out to be stronger than expected were lower than the costs if it turned out to be weaker than expected. Subsequent data revisions revealed that inflation was actually quite a bit higher and the output gap considerably smaller than the Committee believed at the time, so policy was considerably more accommodative than they believed it to be. This type of measurement risk heightens the risk of attempting the hot economy strategy.

These considerations leave me believing that a gradual process of raising rates is actually the prudent course at this point. It allows us to continue to monitor and respond to unanticipated

changes in economic conditions and allows us to better calibrate our policy over time as we learn more about the underlying longer-run structural aspects of the economy, such as the natural rate of unemployment, potential output growth, structural productivity growth, and the natural real rate of interest. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Lacker.

MR. LACKER. Thank you very much, Madam Chair. Economic conditions in the Fifth District appear to have changed little since September. There are a couple of exceptions. First, Hurricane Matthew caused extensive flooding in areas of North and South Carolina, although major cities were spared, and that sparked the usual rebuilding efforts. And, second, a number of survey participants and other contacts mentioned the upcoming election as a reason that businesses were hesitant to place orders. Otherwise, conditions looked very similar to what we've seen recently. For example, manufacturing indicators were somewhat mixed this month, as has been the case for the past few months. October survey results indicated continued contraction, although with some improvement from September. The composite index rose 4 points to negative 4. More manufacturers saw wage increases in October, and the wage index, which rose to plus 18, has been in double digits for the past 11 months. The services sector continued to expand in October, according to our survey results and comments from contacts. Difficulty finding qualified workers persists as an issue cited by directors and other contacts. For example, a staffing company reported seeing a sizable shift toward orders for permanent rather than temporary hires, reflecting a desire to lock in qualified workers rather than risk losing them. The wage components across all of our surveys are elevated and have increased notably for the retail sector.

Turning to residential real estate markets, they continue to improve in many areas of the District. For the most part, comments on housing were upbeat, and the CEO of a leading national building products supplier reported strong gains for September and October after several flat months in the late spring and summer and was expecting that strength to continue through year-end. The outlook for commercial real estate is more mixed, according to our contacts. In most markets, the demand for multifamily construction remains strong, although there was a good deal of commentary about financing constraints. Banks that are close to their CRE guidance thresholds are reportedly pulling out of many markets and leaving borrowers to choose among only one or two lenders rather than four or five as had been typical.

Turning to the national economy, the most notable change in the staff's medium-term outlook since our previous meeting was the reduction of the GDP path. Growth in 2017 is projected to be 2.2 percent versus 2.4 percent in the September Tealbook. Some markdown seems appropriate, I think, even though third-quarter GDP growth was a bit above the staff's estimate, because in that report final sales to domestic purchasers were weaker than expected. Growth in real consumer spending, which dominates that category, slowed to an annual rate of 2.1 percent in the third quarter, but that's right in line with growth in real disposable income.

The staff's assessment is that we are at full employment, and that output growth will exceed its trend rate for the next couple of years. But I think there's a good chance that real GDP growth will converge to its trend rate more rapidly than the Tealbook projects. I think we're already seeing some signs of supply-side constraints on growth. Reports of difficulty finding skilled workers have broadened noticeably over the past year or so. We hear many instances of firms limiting current production as a result. In several areas in our District, we've heard that single-family housing construction is being limited by labor constraints as well as by a

limited supply of buildable lots, and we're hearing that many firms are coping with labor shortages by increasing overtime hours for existing workers and by hiring unskilled workers and putting them through training. As I mentioned earlier, we've also heard reports recently of reduced lending for multifamily construction in response to the regulatory burdens.

So I would not be surprised to see real GDP growth fall below 2 percent over the near term as we converge to trend, and a corollary of lower real GDP growth is that employment growth will almost certainly be lower as well. In fact, it would not surprise me if employment growth fell to below 10,000 jobs per month in the near term.

MR. EVANS. Did you mean 100,000?

MR. TARULLO. You said 10,000 per month.

MR. LACKER. I said 10,000? Well, so, you know, if 60,000 per month would keep labor force participation rates constant, and there's a significant amount of noise about 60,000, maybe under 10,000 would be realized as well. I did mean to say 100,000, though. [Laughter]

Turning to inflation, core inflation has averaged 1.7 percent over the past four quarters, up from 1.3 percent four quarters ago. Many forecasters have been surprised by the strength of core readings this year. The Tealbook, for example, last December predicted that core inflation would be at an annual rate of 1.4 percent in the first quarter. It turned out to be 2.1 percent. Similarly, in March, core inflation was predicted to be 1.5 percent in the second quarter, but the latest estimate is 1.8 percent for the second quarter. And in June, core inflation was predicted to be 1.3 percent in the third quarter, but on Friday we learned it was 1.7 percent. The Tealbook still has inflation remaining below 2.2 percent for three more years, though. For me, this year's experience suggests that we seem to be likely to hit 2 percent more rapidly than we otherwise would have thought. Thank you.

CHAIR YELLEN. Thank you. President Evans.

MR. EVANS. Thank you, Madam Chair. The reports from my directors and other business contacts were mixed this round. The consensus seems to be that economic growth is proceeding slowly and steadily. Although nearly everyone had some commentary about the near-term uncertainty, nothing concrete seemed to be flashing red.

I did hear a few more reports of larger wage increases this round, but, in general, the gains were still moderate and not expected to have much of an effect on inflation. Many employers say they don't have the pricing power to pass along more than minimal cost increases to their customers. Others expect productivity enhancements to offset their higher wages, and pretty much everyone is expecting to be living in a low-inflation world for the foreseeable future. My financial market contacts also had little new to report, although I did hear from one large nonfinancial firm as well as from a small business owner that the increase in LIBOR over the intermeeting period had raised their short-term borrowing costs about 25 basis points.

With regard to the national outlook, recent data seem reasonably consistent with our previous economic projections. Overall, third-quarter GDP growth was in line with our forecast, although private domestic final purchases were a little softer than we anticipated and are something to keep an eye on. But we still think that consumer fundamentals are good and that GDP growth will continue to run modestly above potential over the next couple of years. Our GDP growth numbers are somewhat stronger than the Tealbook's, but our basic forecast narratives are quite similar. However, our estimate for the natural rate of unemployment in 2016 is 4.7 percent, and the labor force participation rate is currently below our estimate of its trend. So our Chicago outlook envisions a bit more resource slack remaining in the economy than the Tealbook does. We also see less overshooting in potential output later in the projection period.

The news on inflation has been a bit encouraging, and like the Tealbook, we've nudged up our forecast of core PCE inflation to 1.7 percent this year and see it remaining there in 2017. I would take more comfort from the higher inflation numbers if we were also seeing better news on inflation expectations. The recent uptick in TIPS breakevens is a small move in the right direction, but the levels of breakevens and other financial market measures of inflation compensation are still pointing quite loudly toward downside risks. And the Michigan survey of household inflation expectations has hit a new low. All in all, we seem to be on a steady-as-you-go tack at the moment, and I'm not seeing any significant changes to economic conditions that alter my views on appropriate policy for tomorrow's decision or for the near future.

I apologize for the brevity of my comments today. It's been hard to get my staff to help lately because of late-night World Series games. [Laughter]

MR. TARULLO. It's going to end soon.

MR. EVANS. Well—

MR. TARULLO. One way or the other. [Laughter]

CHAIR YELLEN. Thank you. Governor Brainard.

MS. BRAINARD. The data since we last met have been mixed but consistent, overall, with gradual progress toward our goals. On the labor market, recent payroll gains, averaging around 180,000 per month, are likely sufficient to gradually increase resource utilization, although they are below last year's pace. Even so, I have yet to see clear indications of binding resource constraints. The unemployment rate has moved sideways over the past year at around 5 percent, and increases in labor demand have been met by further cyclical improvement in the participation rate. The participation rate is up $\frac{1}{2}$ percentage point on a year ago. Even so, the prime-age participation rate remains $1\frac{1}{2}$ percentage points below pre-crisis levels. Both the

recent data on average hourly earnings and the employment cost index suggest nominal wage growth of around 2¼ to 2½ percent, up somewhat from earlier in the recovery but still quite modest relative to pre-crisis trends.

It's noteworthy that the improvement in the labor market has likely been of most benefit to individuals and families in the bottom part of the income distribution. In particular, the gains in the participation rate over the past year have gone disproportionately to those with relatively little education. And, as David Wilcox's research has shown, incremental improvements in the labor market tend to have the largest effects on minority households. Over the past year, the unemployment rate for African Americans, for instance, has fallen 1 full percentage point as the overall rate has held steady. We also learned over the intermeeting period that the poverty rate declined 1.2 percentage points last year, the largest reduction since the onset of the Global Financial Crisis. Median household income rose more than 5.2 percent for the first time since the financial crisis, and you can see the improvement across all racial and ethnic groups. The improvement in median incomes was greatest for households at or close to the bottom of the income distribution. Thus, the continued gradual improvement in the labor market is increasingly benefiting those individuals and communities most in need.

Turning to aggregate spending, the latest data have been mixed but, overall, suggest a continued moderate pace of expansion. Private domestic consumption and fixed investment, the most forward-looking components of GDP, rose at only 1.6 percent annual rate in the third quarter, down from average growth of 3 percent over the previous several years. Consumer spending appears to have slowed. The level of single-family housing permits, likely our best indicator of housing activity, has changed little, on net, over the past year. This slowing in consumption and housing is noteworthy because these two sources of demand have more than

accounted for GDP growth since the end of 2013. After contributing 2½ percentage points, on average, in 2014 and 2015, consumption and housing contributed only 1¾ percentage points in the first three quarters of this year. Business fixed investment, which declined over the first half of this year, has shown some tentative signs of turning up.

Turning to the international environment, this relatively weak domestic momentum is of some concern because recent events remind us of the significant downside risks coming from abroad. Increasingly, markets are assuming that the most that can be expected from the ECB and the Bank of Japan is that they can hold the line in terms of the degree of accommodation because they face increasingly unattractive tradeoffs in the absence of large fiscal changes. Recent communications suggesting the United Kingdom is pursuing a so-called hard Brexit from the EU led to a sharp, 6 percent decline in the pound and a markdown of medium-term growth prospects in the United Kingdom and the EU. In addition, as we just discussed, during the intermeeting period market concerns about Deutsche Bank increased as anticipation of fines for past violations led to a reassessment of its profitability, which was already under pressure, and some counterparties began to limit their exposure to the bank, which was deemed by the IMF to be the world's most systemically risky. These developments remind us that fragile banks and low economic growth in Europe could feed off each other, with potentially destabilizing effects on the European economy and spillovers to our financial markets. Indeed, the concerns about a hard Brexit and about Deutsche, which have emerged in sharp relief in the intermeeting period, are somewhat at odds with our characterization of risks in the statement. Finally, while relatively buoyant Chinese economic growth so far this year has reduced near-term risks, the quality of that growth has been quite poor, with the debt-to-GDP ratio and corporate indebtedness in particular already at extremely elevated levels and continuing to climb. This

poses important medium-term risks. These downside risks coming from abroad remind us of the importance of asymmetry and risk-management considerations, a subject to which we return tomorrow.

Turning to inflation, the most recent data offer hints that inflation may indeed be moving toward our goal after a very long period of underperformance. People have noted the 12-month change in core PCE prices in September was 1.7 percent, at the upper end of the range of values occupied since mid-2012. Inflation compensation, as measured by TIPS and by yields on nominal Treasury securities, has increased about 20 basis points since our previous meeting, which is also welcome. However, these tentative signs of improvement come against a backdrop of persistent shortfalls from our 2 percent target. Moreover, five-year inflation compensation five years ahead remains very low at 1.6 percent—1 percentage point below levels prevailing before mid-2014—and survey measures of longer-term household inflation expectations are still very low. Thus, although the recent news has been positive, getting back to a credibly symmetric 2 percent target will require continued progress in the labor market and the absence of adverse shocks from abroad.

To conclude, I've been wrestling with this question we've discussed of the wisdom of preemptive tightening to guard against the risks of allowing the labor market to experience material further improvement. And I know some who've looked at past episodes of low unemployment have cautioned that further improvement would bring with it significant recessionary risks. I think it's important to realize that today's circumstances are importantly different. In the past, low levels of unemployment have been associated with relatively rapid increases in inflation. A key channel was likely inflation expectations, which, starting in the mid-to-late 1960s, likely began to move higher and became unanchored. It's also helpful to

recall that some of these episodes, certainly in the 1970s, contained dramatic supply-side boosts to inflation, which may have made policymakers more reluctant to move early due to the unattractive tradeoffs. Thus, when policy eventually tightened, it may have been importantly influenced by the need to reduce inflation expectations.

Circumstances could not be more different today. Unlike in the previous episodes, inflation expectations are well anchored to the upside. Indeed, they have been stubbornly low for eight years, and some measures of expectations have moved lower. Moreover, we've observed that other major advanced foreign economies that have allowed persistently weak demand to affect inflation expectations haven't been able to achieve their inflation mandates despite their extraordinary efforts.

In addition, there has been legitimate concern that when the unemployment rate falls too far, financial stability risks are heightened. Here, too, I think it's worth noting that the financial system today is much different than before the crisis. Capital levels have doubled at the largest banks; liquidity is higher; regulatory oversight is considerably more intense; and in cases in which risks have arisen, we have a much better framework for identifying them earlier, as we just saw in the previous session. For example, in leveraged lending and CRE, regulatory guidance has pushed back, and there are some signs that it has been effective. In short, we must continue to be vigilant against signs of undue risk-taking in financial markets, but we should also recognize that the tradeoff between the kind of high-quality improvement in the labor market that I discussed earlier and low-quality growth in the financial sector that has sometimes occurred as expansions mature is not inevitable. Thank you, Madam Chair.

CHAIR YELLEN. Thank you very much. And I think this would be a good time for a short break. Why don't we return at 4:15, in about 15 minutes.

[Coffee break]

CHAIR YELLEN. Okay, folks. Let's resume the economic go-round, and President Bullard is on.

MR. BULLARD. Thank you, Madam Chair. Incoming intermeeting data seem to be consistent with the regime-based view of the state of the U.S. and Eighth District economies. The regime is characterized by relatively slow real GDP growth at 2 percent per year; stable unemployment, which remains in the 4½ to 5 percent range over the forecast horizon; and an inflation forecast roughly centered on the Committee's inflation target of 2 percent. That is, looking at a chart, once uncertainty is taken into account, it would look like 2 percent is roughly in the middle of the probability distribution for the forecast. You could look at panels 7 and 8 on the U.S. outlook, which were just handed out, to see examples of that.

District contacts emphasized a relatively weak agribusiness sector, along with weakness in some heavy manufacturing. Some contacts at large firms stressed that slow growth and low interest rates would continue to make mergers and acquisitions the top business strategy for the future. Housing market contacts reported relatively strong results. District labor markets appear to have outperformed national labor markets in recent months. Commentary from the health-care sector was mixed.

Nationally, the third-quarter real GDP estimate of 2.9 percent was about as expected, according to tracking estimates on the eve of the announcement. Most tracking estimates for the current quarter are lower. The median of tracking estimates around the Federal Reserve System is currently about 2.1 percent for Q4. This means that the real GDP growth rate for the year as a whole will likely be somewhat below 2 percent, perhaps 1.7 or 1.8 percent, once we have all available information. Many forecasts for 2017 real GDP growth are close to 2 percent. I regard

these available data and forecasts as consistent with a regime of 2 percent growth in real GDP over the forecast horizon, and this is likely the current trend pace of growth for the U.S. economy. In light of this outlook for real GDP growth, I continue to expect unemployment to remain in the 4½ to 5 percent range over the next several years, and I expect inflation to be centered on the 2 percent target. I think this outcome can be supported with a policy rate setting only slightly higher than currently.

In short, unlike many around the table, I would not interpret the current situation in cyclical terms. I do not see the current situation changing unless at least one of two things happens: Number one, there is a switch to a higher-productivity-growth rate regime, which would be associated with faster real GDP growth and a higher real rate of return on safe assets; number two, the large liquidity premium associated with safe assets abates and switches to a value more consistent with historical pre-crisis experience, which would also drive the real rate of safe assets higher; or both. I do not expect either one of these switches to occur over the forecast horizon, but I will keep my eyes open and watch the data carefully. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Powell.

MR. POWELL. Thank you, Madam Chair. The incoming data continue to show moderate GDP growth, a healthy pace of labor market tightening, and inflation gradually moving up to 2 percent. The expected pickup in real GDP growth over the second half of the year seems to be materializing, thanks to the waning effects of oil prices on business investment and an end of the inventory correction. I expect output growth to continue at about 2 percent in 2017 and productivity growth to remain weak, with reasonably strong job growth continuing as well—in

essence, a continuation of the trends that we've seen for the past several years. That does imply significant ongoing labor market tightening.

So far this year, that tightening has taken the form of higher participation as the unemployment rate has moved sideways—a welcome development, as it shows that the economy has had a bit more “room to run.” For the period ahead, I expect that participation will remain about flat, on net, for a while longer or perhaps decline slightly, as that margin of slack has probably been used up, and that job growth will again show through to the unemployment rate, which I expect to decline to the mid-4s over the next year. It's worth remembering again that participation has been volatile this year and can move around two- or three-tenths and it can be noise. If participation had declined as forecast by the Tealbook last December, unemployment would now be 4.3 percent, holding all else equal.

Wages have continued their gradual upward climb. With low inflation and *de minimis* productivity growth, real wage increases are now quite healthy. Real unit labor costs have been increasing since early 2014, and this should put some upward pressure on prices.

Trailing 12-month core inflation has increased 0.4 percentage point over the past year—now it's at 1.7 percent—and total inflation is forecast in the Tealbook to reach that level in the first quarter of next year. In the staff narrative, inflation remains at 1.7 percent next year, despite tightening labor markets and the waning of the drags that I mentioned, because of the unwinding of some transitory factors that are temporarily boosting inflation this year. Overall, inflation has been in line with our forecast for some time, albeit a little higher.

The Michigan survey notwithstanding, there does seem to me to be evidence of a change in inflation sentiment, with higher nominal yields, higher market-based inflation compensation, and market chatter about a modest overshoot. I regard this as a healthy development and hope

that it will be sustained. For me, there is good reason to expect that inflation will continue to move gradually up to 2 percent, with a reasonable likelihood that this will happen faster than in the forecast.

While the U.S. economy remains on a healthy track, the global picture remains a source of risk, whether it is excessive credit growth in China or a hard Brexit or weak European banks or just low economic growth and low inflation. Perhaps with global risks in mind, by a straight read, the market continues to price in only about one rate increase per year, assuming a zero term premium. Of course, term and risk premiums are probably negative, especially at longer durations. Even so, markets are clearly pricing in significant risks of low economic growth and inflation outcomes.

I'm supportive of allowing a modest undershoot of the natural rate of unemployment. With inflation having run below our 2 percent inflation objective every single month since I joined the Board four and a half years ago, I do not expect to feel alarmed if inflation moves modestly above 2 percent, except in what, in my view, is the the highly unlikely case in which longer-run inflation expectations move up excessively. I believe that this approach may help repair some of the residual labor market damage at little risk to price stability. I have supported a patient approach to policy, and I believe that that approach has paid dividends and continues to do so. I do also believe, however, that the risks are now becoming more two sided, and more on that tomorrow. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Fischer.

MR. FISCHER. Thank you, Madam Chair. My presentation will be divided into three unequal parts—the labor market, inflation, and economic growth—and if much of what I have to

say induces a sense of déjà vu, I plead guilty, for the economic situation and the key economic issues have not changed by much since our September decision.

First, the labor market. Nonfarm payroll employment has been continuing to grow at a good pace, averaging 178,000 per month so far this year. There's been one interesting development with respect to the employment data since our September meeting. The headlines about the 151,000 estimated net new hires in August were distinctly gloomy. Those about the 156,000 estimate of net new hires in September were neutral to positive, so much so that I was asked in an interview in mid-September whether the economy was now in a "Goldilocks" situation. I was tempted to answer "yes," with the proviso that Goldilocks isn't what he or she used to be [laughter], but instead switched the topic to the slow growth rate of GDP.

It's not clear why public reactions to almost identical data between September and October were different, but whatever the reason, we need to emphasize that the rate of hiring required to prevent the unemployment rate from rising depends on changes in the participation rate, and that staff estimates of the required rate of hiring range between 75,000 and 150,000. Otherwise, we would be faced with unnecessary public and market disappointment about numbers that could, in fact, be fully consistent with the continuation of the strong performance of the labor market.

Over the course of the past two years, we've been concerned about the effect of a variety of negative shocks on the U.S. economy, including the Chinese devaluation, the market turbulence in the first six weeks of this year, the May pothole, Brexit, and more. U.S. employment has resumed robust growth after each temporary slowdown. This has been, and continues to be, a powerful recovery in terms of one of our two main targets: employment.

Second, inflation. We've not heard many complaints about the low rate of inflation from the general public. The 2 percent inflation target was set originally as a tradeoff between the many costs of positive inflation and the increased efficiency of reallocation in the labor market that a moderate rate of inflation makes possible. I do not recall that the costs associated with the greater probability of being at the ELB with a low rate of inflation was taken into account at the time. It was the early and mid-1990s when the 2 percent inflation target started becoming the received wisdom.

The core rate of PCE inflation has been increasing—slowly, to be sure—and is now close to our 2 percent target. In view of the imprecision of our estimates of the optimal rate of inflation, we should be happy to be as close to the target as we are, particularly when the Phillips curve appears to be so flat. The CPI rate of core inflation has been above 2 percent, but that is not the inflation rate we target, even if it is the rate of inflation with which the public is most familiar. Further, the rate of nominal wage increase has been rising—an indication that the Phillips curve lives, if not with the same vigor as it has in the past. On balance, I believe we are close to meeting our inflation target.

Let me discuss a few other aspects of the inflation target. One is the argument that because we set 2 percent as our target, that's the number we have to hit if we are to remain credible. I give this argument some weight, though I do not believe we need to hit precisely 2 percent, and I believe that the public and the markets will treat small divergences both above and below 2 percent as consistent with our being credible. Taking into consideration the wide confidence interval associated with the economic costs of diverging from the 2 percent target, I still believe it would have been better to define an optimal range for the inflation rate, possibly 1.5 to 2.5 percent, rather than an optimal point estimate.

Finally, on inflation, the jury is still out on whether there's been a permanent downward revision in the level of r^* , something that's extremely difficult to predict, for the future is long and the standard deviation of r^* is large. However, as we've been saying, if r^* remains low for a relatively long time, monetary policy will be constrained by the ELB during that period more frequently than in the past.

Should we, therefore, raise the target inflation rate? Well, of course, the optimal rate of inflation is an area of active research and debate. But actually changing the target rate is a serious matter not to be entered into lightly. There are welfare costs associated with higher inflation, especially the advent of more widespread indexation, which kicks in at a relatively low rate of inflation. There is, further, the credibility cost of changing the target inflation rate, something that done once becomes a permanent credibility-reducing part of history. If such a step were nevertheless taken, it should include a formal mechanism for dealing with future changes in the target rate—for instance, the mechanism used by Canada in which the inflation target can, in principle, be reset every five years. All this is to say that core PCE inflation is, indeed, approaching the 2 percent level, that real wages are rising more rapidly than earlier in the post–Great Recession period, and that we need to think very hard before changing the monetary framework to solve a problem that is likely to be solved within a year or two without changing the inflation target.

Third, economic growth. Here I need to mention that I support everything that President Mester said about what happened at her directors' meeting because I was there, and I was greatly struck by the fact that almost everyone there was complaining about some aspect of information technology. There were the people who were in the automobile industry who were petrified

about driverless cars. There were guys in the retail industry who were petrified about Amazon, which was building some huge depot in—was it in Cleveland or in Pittsburgh?

MS. MESTER. In Cleveland.

MR. FISCHER. In Cleveland, and that was going to put them all out of business. And they said, “There are no more malls being built. All you have are strip malls.” There have been only three malls built in the United States since the Great Recession, and that’s a result of the revolution that’s taking place in the retailing industry. So I really began to wonder whether there’s something going on slowly in the background, and whether we’re sort of close to the 1990s solum line when a lot of things are happening, but we’re not seeing much effect of them at this stage, and maybe it could happen later. Thank you for the visit. It was very interesting.

Now, on economic growth, with a first estimate of third-quarter growth at 2.9 percent, it’s tempting to say that the period of very slow growth and negative productivity growth from which we’ve been suffering for several quarters should no longer be relevant to our thinking about the growth of the economy in the next few years. That’s especially so, because the 2.9 percent real GDP growth was probably accompanied by positive productivity growth, and that estimated productivity growth could soon return to the 1¼ percent rate that the staff now regards as its long-run level. Well, those could be the directions in which data on, and expectations of, growth will move in the next quarter or two, but the data of one quarter do not make a trend. Tealbook A forecasts that total labor productivity will increase at a rate of 1.1 percent in 2017 and 2018 and 1.2 percent in 2019. We’ll have to wait and see whether that’s what happens—namely, whether productivity over the next few years will grow at a rate close to 1.1 percent or possibly even a little higher. And as we wait to see whether productivity growth increases, we’ll need to monitor the situation closely, to look at the details of growth, and be prepared to change policy in

either direction should that become necessary. If productivity growth, in fact, increases, we'll have to remember the standard warning that the IMF dispenses when things are going well: Complacency must be avoided. But, truth to tell, the FOMC is a committee that shows few signs of succumbing to the disease of complacency. [Laughter]

The slow growth of the economy since the Great Recession is due mainly to the extremely low rate of productivity growth, for which the low rate of physical investment, despite the near-zero short-term interest rate, bears the significant share of the responsibility. But there's not much that we in the Federal Reserve can do that directly affects productivity growth except to maintain conditions conducive to investment and productivity growth—which one thought were low interest rates—by giving confidence to investors in the stability of the economy, especially the stability of the financial system, and by continuing to support the excellent research on productivity growth of several of our Federal Reserve economists.

Now, each of us probably asks herself or himself from time to time why the outstanding employment performance of the economy in the period since the fall of Lehman Brothers and the essential role of the Federal Reserve in producing that result are so underappreciated. Well, almost certainly, the slow rate of real GDP growth during that period and the phenomena that indicate animal spirits are low are both important factors in this regard. For some time, answers to two questions in public opinion surveys have presented an interesting contrast. Asked whether they're satisfied or dissatisfied about the way things are going or similar questions, a large majority of the public is dissatisfied. Yet University of Michigan and Conference Board consumer satisfaction polls say that Americans are just as happy or optimistic as they were before the Great Recession. Ben Bernanke took up this contrast in a June blog and Alan Blinder wrote about it in an op-ed in the *Wall Street Journal* on October 25. Ben concluded—and here I

quote Alan Blinder’s article that agrees with Ben—that it “might be the increasingly shrill, partisan nature of our politics, not the state of the economy” that has so disappointed Americans, or, as the headline to Alan Blinder’s article says, “It’s Not the Economy, Stupid. It’s the Political Gridlock.” All that is by way of suggesting that people don’t feel as bad about the economy as many, certainly including me, have for some time felt that they do. Thank you, and more tomorrow.

CHAIR YELLEN. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Madam Chair. Since the previous FOMC meeting, there’s been a conceptual agreement, well documented or publicized, between OPEC nations to limit production levels, and we believe this agreement for a time has had some positive effect on oil prices. However, on the basis of on discussions with our contacts, we believe that the details of this agreement may be very tough to work out. And until the details are explicitly agreed upon, we are quite skeptical as to whether this agreement will ultimately translate into actual supply reductions among OPEC nations.

Despite this backdrop, it continues to be our belief that global supply and demand are moving toward balance. And while there’s some disagreement regarding the exact timing, we believe that the market should get into global balance during the first half of 2017. This judgment, again, is based on our estimate that the growth of global supply is slowing and that global demand is growing at approximately 1.2 million barrels a day this year and should grow at a similar rate in 2017. We believe that price volatility will persist, in view of the imperfect nature of supply–demand information in this market as well as the fact that excess inventories continue to stand at record levels. But, while we expect continued price volatility, it’s likely to occur in an overall context of firming prices.

The rig count in Texas and across the nation is continuing to build, but based on discussions with our contacts, we believe the rig count will not accelerate until producers become more confident that oil prices can reach between \$55 and \$65 a barrel within the next year or two. Long-lived projects will take longer to be initiated, not only because they require higher breakeven oil prices but also because the priority for many integrated oil companies is to maintain their dividend levels rather than allocate resources to capital expenditures. In the meantime, though, we expect more bankruptcies, mergers, and restructurings in the industry for the remainder of 2016, and, in fact, one significant one was announced this week. And we see three reasons for this: One, a number of companies are highly leveraged; two, the current market price is still below breakeven for many fields; and, three, lenders are increasingly focusing on cash flow versus asset values in decisions to extend credit.

In terms of the District, Texas employment growth was a bit under 1 percent at an annual rate over the first six months of 2016. Our forecast, though, is that the rate of job growth will rebound to approximately a 2 percent rate in the second half of this year and continue at a similar pace in 2017. As headwinds from weak energy and a strong dollar continue to dissipate, we are seeing some stabilization and even modest growth in manufacturing as well as in exports from the State of Texas. Texas continues to benefit from migration of people and firms to the state.

In our surveys, the District is seeing not only building wage pressures in skilled trades in industries like construction, truck driving, nursing, IT, and the like but also broader evidence of labor shortages in the District. The state's high schools and colleges are increasingly offering skilled trade degrees to their students in an effort to address the state's skills gap. In addition, there's a growing effort to address lagging educational attainment levels in the state by focusing on improving pre-K literacy levels for at-risk populations. The Dallas Fed, as well as many other

Federal Reserve Banks around this table, is playing an active leadership role in order to spur more of these efforts in our District.

Regarding the nation, I have not materially changed my economic forecast since the previous meeting. On the basis of our expectation of a strong U.S. consumer, the Dallas Federal Reserve continues to estimate that GDP growth for the year will be somewhere between 1¾ and 2 percent. We expect this growth to be sufficient to produce a further reduction in labor market slack in the economy. The Dallas trimmed mean, as some of you have already noted, is currently running at approximately 1.7 percent—it's been running at that level basically all year—and we continue to believe that we will gradually reach our 2 percent objective in the medium term.

The main focus for our research team and myself continues to be to try to understand several key persistent economic headwinds. The first is aging demographics in the United States as well as in almost all other advanced economies. The second trend we continue to try to understand is globalization, particularly excess global capacity and high levels of debt in China, which is having and will have an effect on global economic growth and inflation as well as creating vulnerability to periodic bouts of financial instability. As Governor Fischer just mentioned, technology-enabled disruption is a third trend we are working heavily to try to understand. In our view, it's happening across almost every industry. It's having the effect of reducing pricing power, squeezing margins, and increasing uncertainty, which in turn is likely affecting the propensity of companies to allocate resources to capital expansion and capital spending. And the last big trend is high levels of government debt to GDP across most major economies, which at a minimum is squeezing out the capacity for fiscal policy and other actions like infrastructure spending that could help improve GDP growth.

One last comment regarding business tone—and I guess I’ll refer to this as “CEO tone”—draws from discussions with CEOs in our District and some scattered CEOs across the nation. At the previous meeting, I mentioned the issue of rising shareholder activism and the generally shorter investor time horizons that I’m observing. Let me say another word about this. As Dennis Lockhart mentioned earlier, more money is going into passive funds—that’s well documented—with very low fees. As a result, active managers who remain are under increasing pressure to outperform and justify high fees. In that context, activism has increased because it’s a way for active managers to demonstrate outperformance. It’s also putting much more pressure on active managers to show performance more quickly because they’re under regular pressure from the threat of investor redemptions.

This trend of shorter time frames and greater activism—combined with high rates of technology-enabled disruption, higher levels of regulation, and sluggish global demand—is making it tougher for CEOs to choose capital spending over share repurchase or dividends or cash mergers. As I said in the September meeting, I think this trend is intensifying and, in my opinion, may be one reason why capital spending levels have been very sluggish and disappointing. I don’t see this trend reversing unless we experience higher rates of GDP growth or see potentially greater tax and other incentives for capital spending or both. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Harker.

MR. HARKER. Thank you, Madam Chair. Over the intermeeting period, overall economic activity in the Third District continues to be a bit sluggish, with economic growth a bit below trend. Job growth continues to lag the nation, with year-over-year employment growth at a mere 0.4 percent in September, less than half that of the nation. The unemployment rate

remained at 5.5 percent, a full ½ percent higher than a year ago. That said, the region's higher unemployment rate is largely due to higher labor force participation than the nation as a whole, and almost all of the increase in regional unemployment has occurred in Pennsylvania. In addition, the sectors facing the stiffest challenges remain mining and drilling in the Marcellus shale region, and job growth remains somewhat weak in manufacturing. Our region's relatively weak labor market is reflected in our state coincident indexes that, with the exception of Delaware, are measurably less robust than the national average. For example, over the 12 months ending in September, Pennsylvania's coincident index increased 1.6 percent, compared with a 2.9 percent increase for the nation as a whole.

Manufacturing activity, however, appears to be on a slight upward trend, with October's general activity index in our Business Outlook Survey remaining in positive territory for the third straight month. At 9.7 in October, the index is exactly at its nonrecessionary average. Both the new orders and shipments indexes are now in positive territory as well, but employment has yet to show signs of picking up. Survey respondents remain upbeat, with all of the forward-looking indexes showing substantial optimism.

Now, while we're not generally seeing strong growth in the region, a few areas of the District are doing modestly well. One such area is auto sales, which are holding up at high levels, and the value of residential construction continues at a pace that is somewhat stronger than earlier in the year. Permits are also up, but that increase is largely due to, again, the multifamily sector of the market. Unlike the nation, we have yet to see any firming in single-family permits. Additionally, nonresidential construction has weakened a bit recently, and, like the nation, we are seeing less strength in our retail sector. Regarding Third District consumers, the pace of activity has diminished somewhat, which was reflected in the general activity index

in our nonmanufacturing survey remaining slightly below its nonrecessionary average. But consumer confidence remains high and retailers continue to be optimistic.

Overall, the Third District is seeing, and should continue to see, steady if unspectacular economic growth, and contacts remain upbeat about the future.

Turning to the nation as a whole, we appear to have gotten the bounceback in third-quarter activity that most of us were expecting, but the details were a bit weaker than the headline number, with growth in final sales not particularly robust. I find little to disagree with in the Tealbook forecast, although I anticipate a bit more slowing in employment growth and a bit more of a pickup in inflation. Basically, I see the current unemployment rate at about its natural rate, and economic fundamentals are in line with continued consumption growth. And I agree with the staff that growth in investment may turn positive. But it could remain at troubling low levels. My main worry remains the lack of productivity growth, as others have mentioned, without which it will be difficult to maintain our economic momentum. Overall, conditions remain consistent with a rate move this year, but I'll return to that thought tomorrow. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President George.

MS. GEORGE. Thank you, Madam Chair. The 10th District economy continues to feel the effects of last year's decline in energy and agricultural commodity prices. Job growth is modest or slipping in all of our states except Colorado, and unemployment in Oklahoma and Wyoming is now 1 full percentage point higher than a year ago. Tax revenues also continue to worsen in most District states, creating the potential for future drags on state and local government spending. Construction has slowed in the region, but office vacancies and the inventory of unsold homes remain low, and mortgage delinquencies in energy states have not

shown any concerning increase. Agricultural commodity prices also remain low and have continued to weigh on farm income, farm spending, and economic activity in rural parts of the District.

On the positive side, consumer spending is rising in most District states, and capital spending plans have improved moderately outside of the ag sector. Our manufacturing survey posted its second consecutive expansionary reading in October, the first back-to-back increase in almost two years, due in part to a somewhat brighter outlook in the energy sector. Current oil prices are around the level firms say they need, on average, to be profitable, and energy firms in our region have continued to modestly increase drilling activity and are planning further expansion in 2017.

My outlook for the national economy is little changed since September. I continue to expect a moderate pace of economic growth led by consumer spending. Business fixed investment is also likely to begin making a modest contribution to output growth, as the recent rise in energy prices support new drilling activities, with additional oil rigs contributing to investment in structures. Recent data on shipments and orders for core capital goods also suggest some gains in equipment investment.

Labor markets appear well positioned to support consumer-led growth. Nonfarm payrolls have grown, resulting in nearly 2.5 million new jobs on net. Nominal wage growth has picked up this year, with the Atlanta Fed Wage Growth Tracker indicating median wage growth above 3 percent for all of 2016 and accelerating in recent months. Most recently, it nearly matches the pace of wage gains at the peak of the last expansion. Perhaps most encouraging is that the labor force has increased by 3 million since September 2015, which is the strongest growth in the labor force since 2000. This solid growth in the labor force over the past year is a welcome

development. But as Governor Tarullo highlighted, the increase in the labor force does not reflect a strong pull of workers from the sidelines into the labor market. In fact, the number of labor market entrants has slowed from 6.7 million in September 2015 to 6½ million entrants in September of this year. On the other hand, the number of people exiting the labor force over the past year has declined substantially. Over the past year, the number of workers exiting has fallen from 6.6 million to 6.2 million. Therefore, the growth in the labor force largely reflects slowing in outflows of workers rather than an increase in the flow of workers coming in from the sidelines. The decline in exits suggests workers are now more attached to the labor force compared with earlier years in the recovery.

Finally, I see inflation advancing toward the 2 percent goal, supported by higher energy prices. Headline inflation increased at an annual rate of 2.1 percent over the past six months compared with 1.3 percent over the past 12 months. Market-based measures of inflation compensation have increased, as have flows into investments offering inflation protection.

Thank you.

CHAIR YELLEN. Thank you. President Lockhart.

MR. LOCKHART. Thank you, Madam Chair. The narrative on which I would premise a near-term increase in the policy rate anticipates GDP growth in the neighborhood of 2 percent for the medium term. This modest pace of growth ought to be sufficient to absorb any remaining slack in labor markets and provide support for nudging inflation up to target. I believe my outlook is in the mainstream of this Committee, and it is broadly consistent with the forecast presented in this meeting's Tealbook.

Although Friday's third-quarter GDP report carried mixed messages, the top-line number in last week's GDP report was in line with my expectation of a stronger second half. The uneven

composition of growth was attention getting, but Friday's GDP report did not set off any alarm bells, in my estimation. I would say that, overall, I'm satisfied the economy remains on narrative.

The third-quarter personal consumption number was soft but on the heels of second-quarter strength. Consumer-savvy contacts in my District reported for the most part that consumer spending continues to grow at a moderate pace. Most expect flat-to-slightly-higher holiday sales. One contact offered that consumers are tending to make their purchases later in the holiday shopping season, the implication being that we may not know much about holiday sales results until rather late in December. Translating to the Committee's concerns, we may not have much of a read on fourth-quarter spending at our December meeting.

It's widely recognized that online retailers are experiencing strong sales at the expense of their mostly brick-and-mortar competitors. In response to this trend, our director from a large global package delivery company reported adding a record number of new jumbo jet aircraft to the company's fleet and aggressively expanding its number of facilities. This encouraging business investment report was in contrast, however, to most of what we heard over the past few weeks. Business investment continues to be soft, particularly in the bellwether equipment spending category. Most reports confirm the signal coming from the data.

Regarding net exports, we did not pick up in our interviews this cycle any expectation of ongoing strength in exports. I think Friday's result is best interpreted as a one-off quarter of better numbers, not a trend. The soybean factor was apparently decisive. I'm looking for a headline: "Export Report Full of Beans." [Laughter]

Our District soundings for unemployment and labor market conditions continue to be suggestive of a tightening market, and businesses still report little in the way of pricing power. I

consider the risks to be balanced, and, to summarize, neither our interpretation of the incoming data nor the economic intelligence collected in my District have challenged my basic narrative enough to reconsider a policy move at this or the next meeting. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kashkari.

MR. KASHKARI. Thank you, Madam Chair. Employers in the Ninth District continue to report trouble finding workers. There is some anecdotal evidence that wages for low-skilled jobs are rising. For example, some lower-skilled health-care positions have moved from about \$12 an hour to between \$14 and \$15 an hour in the past year. We've also heard that jobs at customer service centers have seen wages go up from \$12 to \$14 an hour to about \$16 to \$18 an hour. Meanwhile, inflation pressures have remained muted.

Looking nationally, Friday's GDP release contains little evidence to me and our staff of strong forward momentum in the U.S. economy. The headline GDP number for Q3 was decent, but, as many others have noted, domestic demand came in weak and fixed investment continues to decline, signaling little business confidence. With 1.1 percent real GDP growth in the first half, overall growth for 2016 is likely to be subpar, even for the post-recession period.

When I turn to inflation, the news is somewhat better. The latest data show a small uptick in core PCE inflation, which I'm happy about. Core inflation in Q3 came in at 1.7 percent, and the Tealbook has marked up the both 2016 and 2017 core PCE projections from 1.6 to 1.7 percent. Market-based inflation expectations have also ticked up recently. Meanwhile, wage growth remains moderate. Now, these are welcome developments, but I, like many of you, am also concerned that both market- and survey-based measures of inflation expectations remain extremely low by historical standards. For me, I don't know whether this uptick is a signal or noise. I hope it's a signal, but I'd like to see more evidence before I draw

any firm conclusions. Meanwhile, in the global economy, world inflation and global economic growth remain subdued.

Now, regarding the labor market, U.S. employment continues to rise strongly. The optimistic narrative that I and several of us around the table have been emphasizing this year is that the United States can continue to add a lot of jobs without driving unemployment uncomfortably low as long as we can keep adding to the labor force, which we've been doing. The headline rate even ticked up just slightly. This has been the story over the past 12 months, a period during which the unemployment rate has barely budged, while prime-age labor force participation, ignoring demographic effects, has risen about 1 percentage point.

So the big question for me is, how much longer can this play out? Prime-age labor force participation fell very sharply during the recession, and it's still about 1½ percentage points below where it was in the mid-2000s. Prime-age male labor force participation is also very low in the United States compared with most other OECD countries. So there's a very real possibility—it's not impossible—that prime-age labor force participation could continue to rise back to levels seen in the 2000s. If prime-age labor force participation rose another 1 percentage point over the next 12 months, as it did over the past 12 months, that would be another 1.25 million Americans in the labor force. And many people around the table have said the narrative is about people reentering the labor force. It's not that. It's people not leaving. I'll take it either way, and I know all of you agree. Either way, it's a net positive for the country.

My conclusion is, my baseline outlook is more of the same: modest GDP growth, subdued inflation. It's very possible we'll see continued decent job growth supported by rising labor force participation without seeing much in terms of inflation. Again, we just don't know, and until I start seeing some signs of that process petering out, I'd like to give it more time to

run. Overall, risks remain tilted to the downside. We're currently not well placed to respond to the next negative shock that pushes us back onto the lower bound. Thank you.

CHAIR YELLEN. Thank you. Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you, Madam Chair. On the economic growth side, I'm pretty much with everyone else. I anticipate that the economy will continue to expand at a slightly above-trend pace. I agree with others that Q3 GDP probably overstates that strength a bit because of the big rise in exports, which was so narrowly based on the soybean factor, and because we had a sharp swing from inventory liquidation back to accumulation, which probably won't be repeated in the fourth quarter.

When I look at the economy, I think the good news is that it seems to be relatively well balanced. The drag arising from the collapse in oil and gas drilling activity looks to be over. Household income is rising. The household saving rate and household balance sheets appear supportive of continued gains in consumption. Both residential and nonresidential investment seems likely to expand gradually, with, presumably, business fixed investment getting some lift once the uncertainty surrounding next week's election is resolved. Of course, it depends on how that uncertainty is resolved. I'll have more on that in a minute. At the same time, I don't see what would cause the economy to expand much more quickly. Cyclically, the expansion seems to be relatively mature at this point. So, for example, if you look at cyclical sectors such as motor vehicles, they seem close to their cycle peaks. Housing, though, seems to be a bit of an exception, and why housing starts aren't stronger is a little unclear to me.

With respect to the election, the concern of market participants appears to be the tail risk—either a sweep by the Democrats or a sweep by the Republicans. We had our buy-side advisory group in a couple of weeks ago, and the prevailing view was that if we had control by

either party of both the Congress and the White House, that would increase uncertainty and would lead to an equity market selloff. In contrast, if current expectations were realized—a Clinton victory and a Republican House, with the Senate uncertain—the view among this group was generally on the side that this would be considered a continuation of the status quo and there wouldn't be much of a market response.

There does also seem to be, however, some sentiment that, regardless of the outcome, the Congress would be more willing to move forward with an infrastructure spending program. And that's interesting, because fiscal policy is really not on such a great path. But if you add an infrastructure spending program on top of that, the fiscal situation may start to reemerge as an issue. It is very quiescent today because interest rates are low, and people don't see any negative consequence of that. If we actually normalize interest rates over time, then the net interest cost on the government debt will start to go back up, and that'll be another burden. So I think the confidence in the sustainability of the fiscal path today is much overstated relative to the path that we're actually on. I thought it was interesting that, in New Jersey, we had legislation to raise the gasoline tax by \$0.23 per gallon to fund the transportation infrastructure program. And the fact that it went through is probably an interesting leading indicator that there is actually more voter support for greater infrastructure spending in this country.

On the inflation side, I do take some signal from the slight firming in the core inflation trajectory and the fact that some market-based measures of inflation compensation have firmed in recent weeks. I think this development does help support the case for tightening monetary policy at our next meeting in December, assuming that the economy stays close to its current trajectory.

However, I don't think that there's any great urgency to tightening. The economy is growing at only a slightly above-trend pace. Inflation is still below our target. There still may be some excess slack in the labor market, judging from the fact that the above-trend payroll growth hasn't caused any downward movement in the unemployment rate this year. And the pickup in nominal wage growth—I think there has been a pickup—has been very modest. I thought the third-quarter employment cost index release was interesting in the sense that it showed a 2.3 percent year-over-year rise in total compensation, which was not an acceleration from the previous quarter. And 2.3 percent is not a very high rate of increase in employee compensation. Also, judging from the modest forward momentum in the economy, it doesn't look like our nominal federal funds rate target is very far below a neutral monetary policy setting. I judge the gap today as only about 100 to 150 basis points. And that's a gap we could close relatively quickly, should that prove necessary.

So the lack of urgency implies that there is not a good case for moving at this meeting. To do so with the election a week away, the outcome uncertain, and no scheduled press conference would imply an urgency to move that I just don't think is consistent with the incoming information or the economic outlook. Thank you, Madam Chair.

CHAIR YELLEN. Thanks, everyone, for an interesting discussion of the outlook and the risks. And, if I might, I'd like to wrap up the go-round with some of my own comments on recent data, the near-term outlook, and their implications for our policy actions in December and into next year.

Although we haven't received much data since our September meeting, what we have received suggests that labor market conditions continue to improve. Payrolls rose almost 160,000 in September, only a little slower than the roughly 180,000 per month pace seen since

the start of the year and well above their longer-run trend. Labor force participation has continued to move sideways, a favorable development in light of the downward pressure from demographic trends and one that's allowed the unemployment rate to remain close to 5 percent for the past year amid solid job growth. Along most other dimensions, labor market conditions are little changed this year. The broad U-6 measure of unemployment continues to move sideways, as have JOLTS measures of job openings, hires, separations, and quits. Business survey readings on net hiring plans and the difficulty of filling jobs have also been flat since January. However, household perceptions of job availability have trended up since the start of the year, as has the employment-to-population ratio.

So, where does that leave us? So far, I see few signs of overheating in the labor market. Reports of worker shortages have increased, particularly for certain occupations and in some sectors. And in response to a tighter labor market, wage growth has picked up somewhat from a year ago. Nevertheless, wage gains remain moderate overall, with average hourly earnings and the ECI rising only 2.6 percent and 2.3 percent, respectively, over the past 12 months.

For these and other reasons, I continue to believe that some modest amount of slack remains, and that we should welcome a limited degree of further tightening, particularly with inflation still running below 2 percent. Moreover, I continue to put some weight on the possibility of letting the economy run a bit hot for a time—and let me emphasize here that I mean “hot” in the sense of allowing the unemployment rate to decline a little bit below current estimates of its natural rate—a path that is exactly consistent with the median unemployment projection in our September SEP. Allowing the economy to run hot in that sense could have favorable supply-side effects, as I noted in a recent speech. And I was interested that several of you, in your own comments, mentioned the increased efforts that you've seen firms make in

terms of investing in training and hiring workers who were less skilled and investing in them so that they can occupy jobs for which they're not able to hire the people with the skills they'd ideally like. I consider that kind of investment in workforce training and upgrading to be exactly an example of the kind of favorable supply-side effect that I think you would expect to see in a tight labor market.

But I don't want to overstate my expectations on this score. In the case of the participation rate, I don't expect it to remain flat for much longer, in view of research within and outside the Federal Reserve suggesting that the current rate is near its longer-run trend, which is clearly headed down. And, although involuntary part-time employment remains well above its pre-crisis level, I cannot be sure that structural change over the past decade has not resulted in a new, higher norm. In light of the uncertainties we face, I would not be especially surprised to see the unemployment rate fall sharply over the next few months even though my baseline forecast has labor utilization tightening more gradually than that. This possibility and the fact that monetary policy operates with a lag limit how far we can safely go in probing the economy's ability to absorb relatively rapid employment growth. Although we have discovered over the past year that we have somewhat more "running room" than we might have expected regarding the pace at which we need to tighten, the extra room is only so great and could quickly disappear.

I will now turn to real activity more broadly. The incoming data have been somewhat mixed but, on balance, suggest that the economy is continuing to expand at a moderate pace. Although real GDP rose at an annual rate of almost 3 percent in the third quarter, a robust pace by recent standards, much of that strength reflected what's probably a transitory swing in inventory investment. And, overall, as several of you noted, real GDP growth was boosted by a surge in soybean exports. In other categories of spending, conditions were relatively lackluster.

Growth in consumer spending slowed appreciably from the rapid pace seen earlier in the year and by more than the staff expected. The recovery in residential construction seems to have stalled out for reasons that are not clear—raising questions about the sector’s future prospects even if mortgage rates remain low—and business investment continued to be surprisingly soft.

If we cut through the quarterly ups and downs, real GDP growth over the past year was quite mediocre, only 1½ percent. I hope we will see some step-up in coming quarters.

Consumer spending is likely to continue to grow at a moderate pace, supported by ongoing employment gains, previous increases in wealth, and low interest rates. Business investment may also pick up now that drilling activity has finally bottomed out and is starting to rise again. But with the dollar still elevated and only lackluster economic growth abroad, there’s not much reason to expect a lot of support from net exports. Overall, real GDP growth will probably run in the vicinity of 2 percent in coming quarters, enough to keep employment rising somewhat faster than its long-run trend as long as productivity growth continues to be anemic. Under these conditions, r^* is likely to remain low for the foreseeable future.

Regarding inflation, the recent news has been encouraging. Both headline and core consumer prices have come in somewhat higher than expected in recent months. Moreover, spot oil prices have moved up recently and will almost certainly put significant upward pressure on consumer energy prices in the next few months. And because the dollar has been stable for some time, core import prices are now rising at a moderate rate rather than falling.

On the basis of this information, the staff now projects that by the time of the December meeting, the data in hand will show overall PCE prices rising almost 1½ percent on a 12-month basis, with core PCE prices up about 1¾ percent from a year earlier. Such price increases would represent considerable progress toward our inflation objective since we first raised the federal

funds rate late last year. At that time, headline PCE inflation was running below $\frac{1}{2}$ percent, and core inflation was only a little above $\frac{1}{4}$ percent.

Of course, only time will tell whether these encouraging developments will continue into 2017 and be followed by further progress over time. The recent firming of core PCE inflation may signal a persistent acceleration in prices, but it also could represent the transitory effects of special factors such as movements in nonmarket prices. And we cannot rule out the possibility that developments abroad could again put upward pressure on the dollar and cause oil prices to fall, thereby restraining inflation for a considerable time. That said, developments this year have increased my confidence that, with the unemployment rate likely to run a bit below its estimated longer-run level, inflation will move back to 2 percent over the next couple of years.

Let me conclude with a few observations on some of the issues we will face in coming weeks. If the data come in about as the staff expects, I think it would be appropriate to raise the target range for the federal funds rate in December. Employment will have been increasing at a solid pace, accompanied by moderate GDP growth, and inflation will be up noticeably from where it stood when we first raised the federal funds rate. Furthermore, I anticipate that an increase would be appropriate even if the data come in a little on the weak side over the next few weeks. For me, it would take something quite surprising to merit leaving the federal funds rate unchanged in December.

We're in a good position to move in December from a communications standpoint. Market participants currently place the likelihood of a hike at either the November or December meeting at 70 percent. This figure strikes me as about right, against the background of the many unexpected things that can happen in this world. So we shouldn't expect and shouldn't want market participants to view a December move as completely "baked in the cake."

I think the language of alternative B should succeed in communicating our expectation that we expect to move but are preserving our options, and thus it should not have a marked influence on market expectations in either direction. At this point, I'm not overly concerned that the market may misinterpret a December increase as a signal that we no longer intend to move gradually and proceed cautiously in adjusting policy in pursuit of our employment and inflation goals. Our actions over the past year have amply demonstrated that this Committee is prepared to be patient and will not tighten unless and until it is appropriate to do so. Nevertheless, we will need to monitor market reactions carefully to make sure that our intentions and strategy are understood.

Let me stop there. I think we have plenty of time tomorrow for our policy round, and I think maybe we could stop and have the reception. Dinner will be ready at 5:30. However, let me just mention before we break for dinner that, unfortunately, this dinner will need to be our last regular such event on the evening of the first day of an FOMC meeting. As many of you know, the Martin Building is going to be closed starting in December for renovation, so, unfortunately, this is our last regular, normal dinner gathering.

VICE CHAIRMAN DUDLEY. The last supper. [Laughter]

MR. LACKER. “For some time”?

CHAIR YELLEN. “An extended period.” [Laughter]

MR. LACKER. I appreciate it—thanks. I knew there was some guidance there.

CHAIR YELLEN. It won't be as long as “extended period” turned out to be. We're hoping for sooner. We will reassemble tomorrow at 9:00.

[Meeting recessed]

November 2 Session

CHAIR YELLEN. Good morning, everybody. Let's get started. I first want to call on Eric Engen for a brief report on this morning's data.

MR. ENGEN. Thank you. This morning ADP, in its employment report, estimated that private-sector employment increased 147,000 in October. That was very close to our Tealbook forecast of a gain of 150,000, which includes an effect of Hurricane Matthew of minus 10,000, as the hurricane hit during the reference week. So the ADP report is very much in line with what we're expecting will come out on Friday for private-sector employment.

CHAIR YELLEN. Okay. Let me now turn things over to Thomas for a monetary policy briefing.

MR. LAUBACH.⁶ Thank you, Madam Chair. I'll be referring to the handout labeled "Material for the Briefing on Monetary Policy Alternatives."

As you know, the market currently places roughly two-thirds odds on an increase in the target range for the federal funds rate by the end of this year. These odds are significantly higher than the perceived probability, a year ago, of liftoff occurring at the December 2015 meeting. No doubt an important contributor to the market's greater conviction of a rate increase by year-end has been the cumulative progress toward the Committee's policy objectives, the reduction of near-term risks to the outlook, and the Committee's acknowledgment in September's postmeeting statement that the case for an increase in the funds rate had strengthened. The drafts of alternatives B and C recognize further progress toward the Committee's employment objective by reporting that "although the unemployment rate is little changed in recent months, job gains have been solid." In addition, those alternatives not only note the increase in inflation since earlier in the year, but also recognize the likelihood of slightly higher near-term inflation by deleting the earlier statement that "inflation is expected to remain low in the near term." As Eric pointed out in his briefing, the staff revised up its near-term inflation projection in response to the recent rise in energy prices and somewhat higher-than-expected readings on core prices. Alternative A, by contrast, makes no reference to the increase in inflation.

Regarding the longer-run outlook for inflation, the upper-left panel of the exhibit shows that the risk-neutral probability distribution of headline CPI inflation over the next 10 years implied by inflation caps and floors now shows somewhat greater

⁶ The materials used by Mr. Laubach are appended to this transcript (appendix 6).

probability of CPI inflation above 2.5 percent than was the case before your previous meeting and somewhat lower probability of CPI inflation below 1.5 percent. In addition, far-forward inflation compensation, which we showed in Monday's pre-FOMC briefing, has moved up about 20 basis points over the intermeeting period, a change that is highlighted in the drafts of alternatives B and C and that likely reflects, in part, less concern among investors about the risk of a combination of low inflation and low economic growth.

The staff projects only a temporary boost to headline inflation from recent energy price increases, followed by a gradual return of inflation from below to 2 percent over the next four years. Accordingly, the drafts of alternatives B and C acknowledge that, even with the increase in inflation since the beginning of the year, inflation is still running below the Committee's 2 percent objective but is anticipated to rise to 2 percent over the medium term. Alternative A emphasizes that the return to 2 percent inflation is expected to be gradual.

However, as discussed in one of the alternative scenarios in Tealbook A, a more rapid and persistent increase in inflation above 2 percent is certainly a possibility—in fact, the inflation path generated by the “Higher Labor Costs” scenario lies well within the 70 percent confidence interval around the baseline projection. As indicated in the upper-right panel, the remainder of my briefing examines two potential implications of such an outcome in which inflation is persistently $\frac{1}{2}$ percentage point above baseline: First, how would that higher inflation path, in hindsight, affect your assessment of the stance of monetary policy today? And, second, how would it affect not only the path of the federal funds rate, but also financial conditions more broadly?

To address the first question—how you might change your assessment of the stance of monetary policy today—I am focusing on how much an unfolding of higher inflation outcomes over the next three years would alter your estimate of the neutral federal funds rate at the current juncture. To obtain a benchmark against which to assess how the revision to the inflation outlook would affect your current assessment of the neutral rate, I compute the Laubach–Williams estimate of r^* , treating the medians of your September SEP forecasts through 2019 as data. Note that the r^* estimates so obtained differ from the SEP-implied r^* estimates I presented most recently in my briefing in September, because the estimates presented here use the Laubach–Williams model's internal estimate of resource utilization rather than the measure inferred from your projected unemployment rate gaps. As shown by the green line in the middle-left panel, if the economy evolved over the next three years in line with the SEP medians, this measure of r^* would remain near its current estimate of $\frac{1}{4}$ percent. In addition, the estimate of its current value would be nearly unrevised in hindsight, as shown by the proximity of the green and black lines in mid-2016.

The middle-right panel shows the path of inflation in the “Higher Labor Costs” scenario when applying the shocks that generate this scenario to the medians of the September SEP forecasts instead of the current Tealbook projection. The gap

between the two inflation paths widens to about 0.6 percentage point by 2019. When using this inflation path, together with the paths of real GDP and the federal funds rate associated with this scenario, as data and re-estimating the Laubach–Williams measure, the path of r^* , shown as the blue dashed line in the middle left, shifts up about 25 basis points over the recent history and the projection period. Thus, if using the real rate gap implied by the Laubach–Williams estimate as a measure of the stance of monetary policy, this alternative scenario would lead in hindsight to only a modest reassessment of the stance of monetary policy.

The response of the federal funds rate embedded in this scenario is determined by applying the inertial Taylor (1999) rule to the deviations of variables from the SEP baseline. As noted in the lower-left panel, the federal funds rate rises to 3 percent by the end of 2019, nearly $\frac{1}{2}$ percentage point above the baseline. This funds rate path is importantly conditioned on the transmission of monetary policy to broader financial conditions embedded in the FRB/US model, including the transmission to longer-term yields and the exchange value of the dollar. In particular, the FRB/US model predicts only a muted response of term premiums, and hence longer-term interest rates, to such a scenario. Due to the gradual response of the federal funds rate and longer-term interest rates, the inflation shock turns out to be highly persistent.

But would the market response to such an inflation surprise be as subdued as envisaged by the FRB/US model? The red line in the lower-right panel shows that the staff's estimate of the term premium component of the 10-year Treasury yield remains quite depressed. This depressed level is due in part to the ongoing effects from the duration risk on the Federal Reserve's balance sheet, but much of it presumably reflects the value of longer-term nominal assets as a hedge in an environment of low inflation and in which short-term rates remain near the lower bound. A decomposition of the change in the 10-year Treasury yield over the period from June 2014 to June 2016, a period that saw a major disinflationary shock, suggests that roughly 50 of the 70 basis point overall decline of the 10-year yield is due to a decline in the term premium.

Accordingly, if investors came to expect a persistent change in the inflation outlook, as implied by this scenario, the past declines of term premiums could unwind rapidly, leading to a stronger transmission from changes in the policy rate to longer-term interest rates than assumed in the FRB/US model simulation. A substantial increase in U.S. longer-term interest rates would in turn likely be associated with dollar appreciation. All in all, therefore, the extent to which the tightening of financial conditions in response to a persistent increase in inflation would come about through a steeper federal funds rate path or through other channels is quite uncertain.

Thank you, Madam Chair. That completes my prepared remarks. The September statement and the draft alternatives are shown on pages 2 to 9 of the handout. I'll be happy to take any questions.

CHAIR YELLEN. Are there any questions? President Evans.

MR. EVANS. I have a question, Thomas. It has to do with the way you described the uncertainty bands relative to the higher labor costs. I heard you comment about how the red line was within the 70 percent confidence bands. I think this is an important question for any future discussion we might have about including error bands associated with our projections. My concern is, it's so easy to glibly say, "Oh, here's a path. It falls within this band." And whether you say it or not, it leaves the listener with the impression that there's not really a significant difference between these. The validity of the bands, unless you're doing something different than I'm familiar with, is point by point by point. So it's only for one particular hypothesis that it's actually correct. I think, in my experience in doing some of these research tabulations of things that sort of fit within an error band, if you have a composite hypothesis like the average response or the discrepancy over four different periods, the tabulations might well end up being something significantly different. Do you have any comments on that?

MR. LAUBACH. I have no objection to that statement at all. I think it is completely right. All I wanted to indicate is our limited ability to actually forecast inflation with precision at such a horizon. Therefore, it's really a statement about whether can we rule that out.

MR. EVANS. Right. I know you're aware of that, and I think I raise it in part because I don't know exactly how likely this particular experiment is without additional tabulations. But if we're contemplating providing bands, I think we need to understand the kinds of statements that we could have firmer confidence in and ones in which we are not quite so sure. Thank you, Madam Chair.

CHAIR YELLEN. President Williams.

MR. WILLIAMS. I have a question on the last bullet point in the lower-left box. I just don't know what the literature tells us about this last bullet point. This is "Rise in longer-term

yields could be associated with dollar appreciation.” I do know that there is a literature that says that if inflation is above expectations, that will cause a reassessment in the market of the future path of interest rates, and that usually, even after you work it all through, it will indicate an appreciation of the currency. I think there is some literature on that.

MR. LAUBACH. Yes.

MR. WILLIAMS. So that’s a clean example. But what you’re doing here is layering on an additional factor, that somehow the term premium today is at an unusually low level, which might, in addition to or as part of this response, move up quite a bit. My question is, first of all, what’s the empirical evidence on that? And, second of all, would an increase in the term premium on longer-term yields, like the 10-year yield, due to fears of higher inflation actually cause an appreciation or a depreciation of the dollar? That last bit isn’t as obvious to me as it seems to be stated here.

MR. KAMIN. I have something quick.

MR. LAUBACH. I apologize for creating work for Steve.

MR. WILLIAMS. It’s just a factual question.

MR. LAUBACH. Why don’t you go first?

MR. KAMIN. Well, let’s put it this way. I actually share some of your curiosity about this issue. In principle, of course, if you have an increase in yields that reflects an increase in expected interest rates, that should have a standard effect of appreciating the currency. When you have a change in the term premium, I think it’s logical to expect a different effect. Because that increase in the term premium in some sense reflects people being less happy to hold the asset, you could imagine that that would actually depreciate the currency. But, looking at it from the other side, you could also imagine that by reducing the price of the bonds, the increase in the

term premium basically encourages some portfolio shift into those assets that again raises the dollar.

As far as the empirics go, this is actually a topic of active investigation right now, and there are different ways to slice it. One approach is to look at the effect of both, let's say, shorter-term yields and longer-term yields on the dollar, with the assumption that the longer-term yields hold more term premium in them. And at least one study finds very mixed results, looking at different actions of central banks. It's all over the map in terms of which of those affects their currency the most.

Another approach that we've been taking is to try to use actual term structure models to look at central bank actions and figure out how much of the resultant change in interest rates after these events reflects the changes in expected rates and changes in term premiums. Some initial results we found for the Federal Reserve suggest that the expected rate part affects the dollar more than the term premium part, but that's pretty preliminary. But I think the bottom line is that both of those do boost the dollar. So the term premium seems to go in the same direction as expected rates. Whether it has more of an effect or less seems to be still a matter of research.

MR. WILLIAMS. Thanks. That's helpful.

CHAIR YELLEN. President Lacker.

MR. LACKER. Thomas, you noted that these estimates use the internal measure of labor utilization from Laubach–Williams. What is the internal measure of labor utilization—I mean numerically—right now?

MR. LAUBACH. Yes. First of all, it's resource utilization. We estimate a GDP gap; we don't have a granular labor market. There's no unemployment rate, for example, in here. Right now, the estimate from our model for the output gap stands at about 1½ percent. One key thing

to understand why the gap stays so flat once you add the SEP forecasts is that the Laubach–Williams estimate of the trend rate of potential GDP growth at this point is about 2¼ percent. So that means that if the median SEP forecast comes to pass, in fact, the output gap edges down a little bit. It does not rise over the projection period. That’s a key part. At that level, there is a tension here between this model’s view of the world and the SEP medians’ view of the world. So what I would like to focus on is basically just the revision in the r^* estimate, because that’s an apples-to-apples comparison.

MR. LACKER. I guess I was also interested in this broader question about r^* estimates and whether placing weight on the Laubach–Williams r^* should also cause one to place weight on their estimate of the gap and trend growth. Is that a corollary?

MR. LAUBACH. Obviously, these things are estimated with a fair dose of uncertainty. So I think, statistically, it’s quite hard to make a strong deduction about whether the output gap now is zero or 1 percent?

MR. LACKER. Okay. Thanks.

CHAIR YELLEN. Are there other questions for Thomas? President Kaplan.

MR. KAPLAN. I’ll ask one very basic question. I could see why higher expected GDP growth would raise the term premium, because higher prospective growth might—to me, would—steepen the yield curve. In your work, you’re saying that even higher inflation not accompanied by higher prospective GDP growth might raise the term premium. And I just want to hear a little bit more about why you would assert that, as opposed to raising the level of the entire curve.

MR. LAUBACH. Yes. One line of logic is suggested by what’s known as consumption-based asset pricing models. Effectively, you can think about in which circumstances do nominal

long-term assets have high payoffs and whether these are circumstances when you value these payoffs most. So it's basically an insurance or hedge property. In a time when you are very concerned about negative surprises about inflation, combined potentially with monetary policy becoming constrained again by the effective lower bound in a period of economic weakness, that would depress the term premium because it would raise demand for these assets.

MR. KAPLAN. Okay, got it. Thank you.

CHAIR YELLEN. Are there any further questions? [No response] Okay. Why don't we begin our policy round? President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. While I would have preferred to move at the September meeting and I would have gladly supported a move at this meeting, I'm willing to support alternative B today. I am comforted that market expectations and the statement are clearly consistent with moving in December unless incoming data dramatically change our forecast. Had the statement not been consistent with a high likelihood of moving in December, I would not have been able to support alternative B.

Because of the slow pace of increases to date, we have the luxury of waiting for a press conference meeting, because a six-week delay under current conditions is unlikely to be particularly costly. No econometric model would argue that moving at the beginning of November rather than the middle of December would make a significant economic difference. However, that does not imply that deferring much beyond this meeting would be without costs. At the previous meeting, I suggested that there were potential costs to waiting too long to raise rates, and that moving gradually may be possible only if we do not get too far "behind the curve."

Furthermore, my modal forecast indicates that we risk plunging past full employment rather than gently probing for the natural rate unless we adopt a higher funds rate path than is currently assumed by the market. This, in turn, implies a significant risk that, the longer we delay raising rates, the steeper the federal funds rate path will have to be and the more likely that financial markets will overreact to the surprise relative to their expectations. Moreover, the further we fall below the natural rate, the higher is the probability that our attempts to get back to full employment will entail a more severe slowdown than we expect. Such a course for policy may thus be much riskier for the economy than a more gradual path that begins sooner. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Williams.

MR. WILLIAMS. Thank you, Madam Chair. At the risk of sounding like a broken record, I favor alternative C. Economic conditions are ideal for a rate increase. The employment and inflation data have been consistent with our forecasts, financial markets are tranquil, and we're already very close to full employment and on a trajectory to overshoot that mandate. Both employment and output growth have been well above trend.

Our past decisions to delay tightening have relied on the low pace of inflation, but there are signs that the tide is turning. The effects of past dollar appreciation and the drop in oil prices have dissipated. Indeed, energy prices have now turned around and are trending up. Furthermore, evidence of increased wage pressure is more apparent. This suggests that there's not much more room to run in the labor market.

Now, several years ago, Chair Yellen compared the state of the economy to a car driving from coast to coast. She used metaphors like "We're about in Kansas now" to convey that, although we'd made a lot of progress, the recovery was far from complete. In terms of our dual-

mandate goals today, the Long Island Sound is now in sight. [Laughter] That contrasts starkly with the stance of policy, for which we seem to have run out of gas somewhere outside of Reno, Nevada. The current economic situation favors tightening, and our policy stance has over time built up considerable insurance against unforeseen risks to the downside. And, of course, should we encounter surprises to the downside, those can be offset through normal adjustments in our policy rate.

Given that alternative C is not the decision the Committee is taking today, the language in alternative B does a very good job of acknowledging our progress to date and leaves conditions proximate to warranting renewed policy normalization.

Now, the last comment I'll make is, President Kashkari yesterday brought up the issue—and his remarks were partially addressed to me, I felt—of, how can one both be for gradual policy normalization and have a view of very low r^* and concerns about our long-run policy framework? And it's a question I've been asked a lot, so let me just very briefly comment on that. First of all, I think President Rosengren laid out the argument just a minute ago—that is, under our current policy framework, which the Committee has agreed on and has reiterated every January, we have a 2 percent inflation objective with a balanced approach to our dual-mandate goals. That's the strategy we've agreed to, and the one that we are making decisions on how to execute—whether we should raise rates or not. As President Rosengren explained—and I agree 100 percent with what he said—in that context, how do we best achieve what I would think of as sustainable maximum employment? If we allow the economy to overshoot full employment by too much for too long, I think that does create greater risks of a reversal through different possible mechanisms, including the one President Rosengren just laid out—that by, in a sense, going for too low of unemployment, we basically undermine the sustainability of the economic

expansion to the harm of achieving our maximum-employment and inflation goals. So I agree completely with Chair Yellen's characterization—that we want to run a moderately hot economy for some time. That will help us get inflation back to 2 percent quicker, and that's consistent with our strategy. But I just worry that if we try to go too far on running a hot economy too hot for too long, it creates some of the risks that President Rosengren laid out. So I just think, in terms of balancing the risks, a gradual path of policy increases makes sense.

I do think that we should be having a serious discussion of the strategy, which I think of as different than the tactical or execution decisions we're making about whether we should raise rates or not? I think we should have that discussion, and we should involve a lot of experts and economists and others in thinking through this over time. That discussion should eventually lead to a decision by the Committee and to a communication of that decision. Then that might imply different policy decisions in the future. But until that discussion has happened and until whatever decisions come out of it, I think it's important for us to execute on the policy strategy we have laid out. I don't think, through our tactical decisions about whether to raise rates in December or not or in September or not, we're really addressing at all these longer-run issues that I'm raising. I mean, I don't think those are really related to that. The longer-run issues are, to me, not just about raising rates or not. They're really more about thinking about what our strategy is and how we communicate that strategy, and then from that follows the actual policy decision. Thank you.

CHAIR YELLEN. Thank you. Governor Fischer.

MR. FISCHER. Thank you, Madam Chair. I don't think it makes sense to change the interest rate this month. There's such a great deal of uncertainty about future nonmonetary

economic policies. That degree of uncertainty will probably, but not certainly, be reduced by the time of our next meeting, and we should therefore not change the interest rate at this meeting.

Our Committee has been extremely cautious about raising the federal funds rate during the period since 2009. That's an understatement. Two arguments have carried the day. The first is that we should not raise the rate, because we could soon be forced to reduce it and return to the effective lower bound, thereby suffering a loss of credibility. The second is that there's very little difference between making the decision at this FOMC meeting and making it at a subsequent meeting.

With regard to the credibility loss of having to return to the ELB, we need to weigh the expectation of that possible loss against the potential credibility loss of hesitating too long. The argument I've made is liable to be countered by the statement that it's only because we kept the interest rate so low for so long that the U.S. economy has performed so well since 2009. I do not disagree with that point, except at the margins. It remains to be shown that the performance of the economy would have been significantly worse with an interest rate path that was now 50 or so basis points above the path that actually obtained—and thus 50 basis points or two interest rate decisions further away from the ELB.

We need to consider the possibility that our superlow interest rates have encouraged financial transactions, particularly mergers and acquisitions and stock buybacks, as much as they have encouraged physical investment. We have been sending a message that says the U.S. economy still requires the support of superlow interest rates to keep itself growing, even at the moderate 2 percent rate to which we've gradually become accustomed. I do not believe that to be the case, for, as I argued yesterday, the recovery of employment has been powerful, and I should have added that it's been robust. I do not believe that maintaining the federal funds rate

so close to the ELB for so long sends the right message to potential investors and others facing intertemporal decisions in the economy. And I do believe we should very soon take the second step on our gradual path away from the ELB and toward normalization.

Finally, as we look to our December decision, we will be navigating treacherous waters. When we make our decision in December, we should be looking ahead and choosing an interest rate that reflects our expectations of future economic policies and of the future state of the economy. Those expectations will and should reflect our expectations of the nonmonetary economic policies that will be followed in 2017 and later. Are we, therefore, going to be making decisions that reflect our political preferences? Absolutely not. As the Chair has emphasized, we will be making decisions that the Committee believes, on the basis of its professional judgments, are in the best interests of the United States. I'm confident we'll continue to follow that principle, as is both our legal obligation and our standard practice. Thank you.

CHAIR YELLEN. Thank you. President Mester.

MS. MESTER. Thank you, Madam Chair. My medium-run outlook is unchanged since our September meeting, and I continue to support alternative C, on the basis of realized and projected progress on our dual-mandate goals.

Labor market conditions continue to strengthen, the unemployment rate is at its longer-run level, and labor force participation is at or above trend. The economy is essentially at full employment from the standpoint of what can be achieved using monetary policy. The unemployment rate is projected to fall below its longer-run level over the next two years, suggesting that the labor market will continue to strengthen. Inflation is moving up, and we're close to our goal.

The risks to the outlook are basically balanced, but they won't remain that way if we fail to remember a lesson from history—that policy should be forward looking. Various forecasts, optimal control exercises, and our own statements indicate that, to promote our longer-run policy goals, it's appropriate that we gradually increase the federal funds rate from its current low level. The path anticipated is quite gradual. This will allow monetary policy to remain accommodative for some time to come, lending support to the economic expansion in the period ahead, allowing u to fall below u^* , and allowing the Committee to calibrate policy better over time as it learns more about the underlying structural aspects of the economy.

I'd be concerned if we started to change our strategy to try to run the economy too hot in an attempt to drive the unemployment rate well below our current estimates of the longer-run rate as a prudent course of action. In the 1960s and 1970s, when this was tried, it resulted in poor economic outcomes. While there are many differences between today's economy and the economy back then, I don't think we should ignore historical episodes that illustrate the risks of trying to use monetary policy to change structural aspects of the economy. But if we were going to attempt the "hot economy strategy," then it would behoove us to change our communications. Such a strategy is inconsistent with a gradual upward path in interest rates. It would more likely entail a much steeper path once rates began to rise.

So in assessing the costs and benefits of our policy actions, I believe it's appropriate today to take the next step on the gradual policy rate path we have been communicating is the appropriate one. I realize that I will likely be in the minority today, and that alternative B will win the day. But I anticipate the Committee will take action in December unless economic conditions come in considerably different than expected. I believe the language proposed in alternative B is consistent with that anticipated action. But at the same time, the language

doesn't pre-commit the Committee to action should the economy evolve in a way that significantly changes our medium-run outlook. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Tarullo.

MR. TARULLO. Thank you, Madam Chair. I'll vote for alternative B, although the language, particularly as understood in the context of the Chair's remarks yesterday and what Governor Fischer and Presidents Mester, Rosengren, and Williams have already said, reflects a higher probability of a rate increase in December than I think likely reflects my own probability of favoring such a move at that time. As I intimated yesterday, my own probability is certainly higher than it has been over the course of most of this year, but it's still not at 70 percent.

I'd like to add a couple of remarks to what I said yesterday. First, I want to reiterate my own conclusion, based on having listened to many of you over the course of several meetings and tried to do some of my own work with the help of the staff here, that I don't think there's a particularly compelling case to be cited by either side from history regarding why one has to move now or why it would be okay to wait. I think, actually, the circumstances are different enough today from what they have been in the past that both sides have something they can cite. But in the end, this is, as I said yesterday, more an intuition than anything else. It's an informed intuition, but it still is, I think, an intuition.

Second, yesterday I concentrated on my own search for tangible indicators that the economy was moving to the point at which circumstances arguably called for an increase in the federal funds rate. I didn't put as much emphasis on the other consideration I mentioned, which is the balance of risks with respect to adverse outcomes conditional on the path that we eventually take. And, as everyone knows, I and others have been concerned with the so-called asymmetric toolbox—or the range of instruments—we have to respond should the economy

underperform or fall into recession over the near to medium term, as opposed to whether it might run a little bit hotter than anticipated.

I have to say that yesterday’s conversation on the implementation framework, which I thought took a welcome diversion to thinking in more general terms about monetary policy, reinforced for me the absence of anything approaching a viable consensus on an efficacious response that we would have if the economy slipped into a recession because of some exogenous shock in the near to medium term. With the yield curve relatively flat now, it seems as though the utility of an additional LSAP would be quite limited—except perhaps in a very substantial amount, which I’m sure would elicit some concerns for other reasons among members of the Committee.

I heard yesterday among numerous members of the Committee an aversion to the use of negative rates, the reasons for which I can understand. But I was left thinking that we really are not particularly well suited to respond should there be—unexpectedly—a recession. And as Eric indicated yesterday, if you just go out a couple of years, the risks of a recession are nontrivial. So that’s still influencing my thinking as well. Having said that, alternative A doesn’t quite capture my views, either. And I’m not going to propose any changes to the language of alternative B that would make it more compatible with my views, because I’ve already heard enough and I know where everybody else is. Thank you, Madam Chair.

CHAIR YELLEN. President Lockhart.

MR. LOCKHART. Thank you, Madam Chair. Our newer presidents—Harker, Kashkari, and Kaplan—may not be aware that we each have a cumulative word quota for our time on the FOMC. And my balance is running low, so I support alternative B and the statement as it stands. Thank you, Madam Chair. [Laughter]

CHAIR YELLEN. Wow. President Bullard.

MR. BULLARD. Thank you, Madam Chair. I support alternative B for today. In my view, our normalization program is not proceeding as planned. One rate increase per year and no change in the balance sheet is not meaningful in the macroeconomic sense. I think it's becoming increasingly apparent that we should de-emphasize the idea of normalization as we go forward. My basic recommendation is that we should plan to go ahead with a rate increase at the December meeting. I think that's necessary at this point to maintain credibility. But I think we should accompany that move with language that further moves in 2017 are not anticipated, and that the next move is as likely to be a decrease in the policy rate as it is to be an increase in the policy rate.

So let me turn to what I see as the problem with our normalization rhetoric. Policy is mostly about the intended path of policy and not the level of the policy rate today. Our rhetoric is that we are on the cusp of a 200 basis point or more move upward in the policy rate. Our forecast is for economic growth near 2 percent over the forecast horizon. In my opinion, this is not meaningfully different from trend, in view of the degree of precision with which we can measure the trend. Our forecast is also for unemployment near the Committee's estimate of its longer-run value, and inflation forecasts are generally centered on the Committee's inflation target. The general contours of this forecast are very similar whether one is looking at the Tealbook, the Federal Reserve Bank of St. Louis Fed forecast, or private-sector forecasts. What is different about private-sector expectations is the policy rate path, which is very flat in the private-sector view in order to achieve the same forecast outcomes.

So let's take the private-sector perspective for just a moment. From that perspective, it looks like any surprise in the form of faster output growth, lower-than-expected unemployment,

or higher-than-expected inflation will be seen by this Committee as a reason to embark more rapidly on a 200 basis point normalization program. From the private-sector perspective, this would be inappropriate. This is like holding a hammer over the economy, as deviations from our forecast expectations will be met very aggressively in the private-sector perception. I think that this is the wrong approach. With the type of forecast that we currently have and the type of private-sector expectations that we can measure, I think we would do much better to characterize current policy settings as approximately correct, in light of the current state of the economy and its expected trajectory.

To conclude, I would say, go ahead for December, but use that moment to realign expectations for 2017 and beyond. In particular, use the December opportunity to get rid of the perception that we are on the precipice of a major policy rate move. I just don't think that that's an accurate description of the Committee's intentions. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Madam Chair. I do believe we're at the point at which it is appropriate to remove some amount of accommodation. I would support doing this, if not today, then very soon. I recommend this in the context of believing that the path of rates over the next few years ought to be very shallow, and the terminal rate is likely to be much lower than we've historically experienced. I believe, therefore, that further removals of accommodation should be done very gradually, with an appropriate amount of patience and caution. I also believe that in the absence of other economic policies, such as infrastructure spending, fiscal policy, and other structural reforms, prospective GDP growth is going to be very sluggish. This is due to persistent secular headwinds I discussed yesterday that do not appear to be abating.

All of this means to me that we can afford to be patient regarding further removals of accommodation. However, I do believe some amount of removal would be healthy in light of building imbalances I see in terms of the effects on savers as well as the distortions regarding asset allocation and other business decisions. These imbalances may not only be difficult to ultimately unwind but also have some behavioral effects that, if allowed to persist, could undermine future sustainable economic growth. Thank you, Madam Chair.

CHAIR YELLEN. Thank you very much. President Harker.

MR. HARKER. Thank you, Madam Chair. Reflecting my view that there remains little to no slack in the labor market and my fairly upbeat outlook for the economy, as well as the persistent gradual progress of inflation moving close to target, I remain committed to the need for a rate hike this year. Benchmark interest rate rules indicate we are getting behind the historical norm for our interest rate setting. The staff's projection of how policy will proceed over the forecast horizon is in line with my own, and, adhering to that, very gradual removal of accommodation needs to begin this year.

I also share some of President Rosengren's concerns that our overly accommodative policy may be creating some financial stability concerns. At this juncture, I tried to ask myself what it would take not to move by year's end, and I could come up with only some extreme events that are very unlikely. In view of the timing of this meeting, we should probably wait until December, but it is essential that we communicate that not moving in December would take a rather severe deterioration in our economic outlook.

My reading of alternative B is that it comes close to doing that. So I can support alternative B at this time. The signal we are sending will, in itself, start the process and will achieve some measure of tightening in financial markets.

So, Brian, please deduct 220 words from my word “Lockhart”—I mean, lockbox.

[Laughter] Thank you, Madam Chair.

CHAIR YELLEN. President Evans.

MR. EVANS. Thank you, Madam Chair. I support alternative B. I do not think a move today is appropriate. As I noted yesterday, I think we have to keep an eye out to make sure that the recent softer tone in private domestic final purchases is just part of the typical ebb and flow in the data that we see in an economy growing modestly above trend. I believe this is the case.

With regard to price stability, core PCE inflation has improved somewhat over the past couple of rounds. I’m pleased to see that the 12-month change has made it up to 1.7 percent for two months in a row. But, as Governor Fischer said yesterday in a different context, “Good. Nice job. But now is not the time for complacency.” I remain concerned about inflation expectations. Core inflation has risen 0.3 percentage point since the turn of the year, and total PCE inflation is up about $\frac{3}{4}$ percentage point. But instead of firming, household inflation expectations have fallen to new lows, and, even with the slight pickup since our September meeting, TIPS breakevens are still down a touch, 10 basis points, since late last year. Furthermore, futures markets continue to indicate that investors are clearly much more concerned about low-inflation outcomes than they are about above-target inflation. This lack of improvement in expected inflation weighs heavily on my assessment of appropriate policy. In my opinion, unless core inflation overshoots 2 percent by some amount in this cycle, I don’t believe the Board’s inflation attractor will get back to 2 percent. And I view that perspective as in line with the long-run strategy that overshooting is consistent with a symmetric inflation objective and trying to get inflation expectations up to 2 percent. If our primary policy objective

now is to get core inflation back to 2 percent sooner rather than later after so many years of undershooting, I would not advocate a December rate hike.

But the Committee has pretty firmly signaled that a hike is important, relying on inflation confidence. Our communications have been pointing fairly forcefully to a rate increase sometime this year, unless there was a clear softening in economic activity. In light of this virtual commitment, if economic conditions remain as they are today, the communications and credibility risks of not moving in December would be significant without a very different policy statement and plan. Hence, I can support the changes in paragraph 3 language that will further validate market expectations for a rate increase in December unless the data strongly object.

What about beyond December? My last SEP submission had three rate increases between now and the end of 2017. For me, I feel that we should not get ahead of this pace unless we see a marked improvement in the data, particularly in the factors underlying our inflation outlook, and I agree with President Bullard's viewpoints on that for characterizing 2017.

I found it useful in my public speaking to communicate about inflation through the lens of the canonical model the Chair spelled out in her Amherst speech last year. Basically, the model's inflation determinants are inertia, slack, transitory factors, and inflation expectations. I find this breakdown helpful for explaining the overall inflation outlook and how this outlook motivates the rationale for my appropriate policy rate path. I think this taxonomy also could be a useful tool for the Committee to use to describe more explicitly the economic conditionality governing our moves after December. Our communications should reinforce that future rate increases will depend on the weight of these factors pointing to attainment of our 2 percent objective sustainably, symmetrically, and sooner rather than later. We should be able to point to

data-based signs of improvements in these indicators when we actually do raise rates in 2017, assuming the data are willing. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Lacker.

MR. LACKER. Thank you, Madam Chair. At our September meeting, I argued that the data since the beginning of the year had essentially met our expectations as expressed in the December SEP. If anything, the real output and productivity data surprised a bit on the low side, and the inflation data have surprised repeatedly on the high side. Intermeeting events caused us to delay the rate increases that the December SEP had envisioned for this year in order to wait for additional data to confirm that these events would have no material effect on the economy. Fortunately, they have not, and the data since the September meeting have just strengthened the case for a rate increase.

Some Committee members have argued that the data came close to confirming our December projections precisely because we delayed rate increases and pulled down the expected policy rate path. I don't find this convincing, however, because the timing isn't consistent with the conventional views about the lags in the effects of monetary policy.

Looking forward to our next meeting, I agree with you, Madam Chair, that some weakness in the upcoming economic data should not stay our hand. This is especially true when we are in the process of converging to a path with lower trend productivity and employment growth. The relevant question is whether incoming data are inconsistent with fluctuations around such a lower trend growth path. As I pointed out yesterday, for example, a payroll employment number as low as 60,000 is compatible with constant unemployment and labor force participation rates. And, obviously, fluctuations within a typical range surrounding such a path

would not be inconsistent, either. As a consequence, it should take an exceptionally dismal data flow for us to delay raising rates yet again. Thank you.

CHAIR YELLEN. Thank you. President George.

MS. GEORGE. Thank you, Madam Chair. I support alternative C, as I view an increase in the federal funds rate as having been appropriate for some time. Core PCE inflation is now running at 1.7 percent year over year, and we're moving past the window when the decline in energy prices has held down headline, as the annualized six-month change in headline PCE inflation is now 2.1 percent. In addition, labor utilization has increased this year, leaving the labor market near full employment. Accommodative monetary policy certainly supported achieving these objectives, but leaving the funds rate at its current level raises concerns. Without gradual adjustment, it seems we risk returning to "go-stop" types of policies that can create volatility rather than subdue it.

Monetary policy has also, perhaps arguably, become more accommodative this year. The funds rate has not changed, but we've signaled a shallower path of the funds rate and a lower terminal rate, this in the context of roughly full employment and inflation near 2 percent. In addition, the real rate remains well below measures of the equilibrium real rate.

Even with some adjustment to the level of accommodation, I expect to see labor utilization rise above its neutral level, which history shows can end poorly. I accept as reasonable the arguments that current conditions are different than those of the past. But this approach sits uneasily with me and, I think, with our statutory objective of effectively promoting maximum employment commensurate with the economy's longer-run potential to increase production.

Bringing more people into the labor force and having stronger attachment is, of course, a desirable feature of a tighter labor market, but I question its long-run benefit. Research by Christina Romer and David Romer published in a 1998 Jackson Hole conference volume argues that the cyclical effects of monetary policy on unemployment are inherently temporary. They conclude that compassionate monetary policy is simply sound monetary policy, policy that aims to keep inflation stable and minimizes output fluctuations.

The possible benefits of continuing to let the economy heat up in terms of reversing past supply-side damage are highly uncertain. Research by my staff has examined the effects of expansionary monetary policy on indicators of the economy's productive capacity in the pre-crisis period. Their findings indicate that after a period of expansionary monetary policy, labor productivity tends to rise because of an increase in capital and labor utilization, but it does not have benefits in terms of capital deepening or TFP. The implication is that the effects are transitory and are consistent with the idea that monetary policy cannot affect the longer-run growth potential of the economy.

Overall, as the economy strengthens, I see growing risk associated with a wait-and-see approach and a stronger case for continuing to normalize policy. Thank you.

CHAIR YELLEN. Thank you. Governor Powell.

MR. POWELL. Thank you, Madam Chair. Today I will support alternative B as written. In my view, it is fair to say that the economy is not so far from full employment and is making reasonable progress toward 2 percent inflation. Nonetheless, other features of the landscape have also weighed in my thinking, including uncertainty about the natural rate of unemployment, the presence of pockets of slack in the labor market, inflation running persistently below target for a long time, inflation expectations at low levels, a weak and threatening global economy, a

dollar highly sensitive to expectations about U.S. policy, and a constrained scope for further easing at the effective lower bound.

So, with all of that background, the Committee’s patient approach has, in my view, been the right one, and that patience has paid dividends and continues to do so. There has seemed to me to be little risk of falling “behind the curve” and plenty of reason to move cautiously. To say it differently, I’ve seen the risks for policy as clearly one-sided. But, as the economic outlook continues to slowly improve, the risks facing monetary policy are also gradually shifting. Today, with job growth continuing at a healthy pace, pockets of slack being gradually used up, and positive news on inflation, I think the risks are beginning to become more two-sided. For example, if measured labor force participation ticks down again, then the unemployment rate could quickly fall well below 5 percent, suggesting less “room to run.” And the volatility in labor force participation measurement this year and over the years suggests that current measurements could be transitorily high. Time will tell.

On inflation, I expect to see inflation move gradually up to 2 percent in the near term, and I see some risk that both headline and core could move up faster than expected. The recent rise in inflation compensation and flows into TIPS suggests that some investors are coming to the same conclusion. Of course, inflation has run below target for so long that it shouldn’t be unwelcome for it to run a bit above target for a time.

I am no longer inclined to put, in effect, zero weight on the possibility that upside surprises in inflation and unemployment could require a more aggressive response and put the recovery at risk. To me, that means that if the economy continues on its long path of output growth modestly above trend, a tightening labor market, and progress toward 2 percent inflation, I would gradually raise the federal funds rate along the lines of the September SEP. And for that

reason, I see it as probably appropriate to move in December if the economy performs roughly in line with expectations and there are no materially negative developments here or abroad. Thank you.

CHAIR YELLEN. Thank you very much. President Kashkari.

MR. KASHKARI. Thank you, Madam Chair. I support alternative B. As we talked about yesterday, the recent uptick in inflation and inflation expectations, at least market-based ones, makes me more comfortable about the possibility of raising rates in December.

Looking forward, I think we need to remain very open to the possibility that labor force participation might continue to rise, and we might, therefore, see continued strong job growth in the context of stable unemployment and subdued inflation. Taking into account our dual mandate, this offers a strong case for moving cautiously with rate increases.

In September, I talked about three metrics that I was looking at: one, a sustained upward movement in core PCE—we've seen an uptick; two, rising inflation expectations—we've seen an uptick; or, three, a significant decline in the headline unemployment rate. I still feel like those are the right three measures for me to have some confidence that this labor force participation story either is continuing or has run its course. So, for me to support a move in December, I'm going to want to see continued evidence along those three measurements to understand where that story is and how much more it has to run.

Let me just thank President Williams for responding to my question from yesterday. One of the reasons I like to go late is that it gives me a chance to respond and it makes it harder for the other person to respond to my response. [Laughter]

CHAIR YELLEN. You can have a two-hander.

MR. KASHKARI. Yes, unless you go for a two-hander, which I understand and which is a stronger intervention. But I understand the point you made—that there’s a short-term consideration, and then there’s a longer-term question of what framework we’re operating under. I just feel like now is a curious time. If we were at the effective lower bound and there was consensus on the Committee that we were going to be at zero or near zero for the foreseeable future, and we’re looking for new ways of achieving accommodation, I could understand exploring a different inflation target or a different regime, like nominal GDP targeting. Or if we were well off the lower bound, in a more normal economic environment, I could understand raising the question “What’s the best long-term operating framework for this Committee or for future Committees?” But I feel like it’s a curious time, when we’re debating whether now is the time to start raising the funds rate, to then say, “Well, maybe we should also be raising the inflation target or changing to a nominal GDP target.” I just see those two things as in conflict, but I understand conceptually that they are separate questions, so thank you for responding to my question.

CHAIR YELLEN. Thank you. Governor Brainard.

MS. BRAINARD. Thank you, Madam Chair. Since the September meeting, we’ve received welcome indications of a continued improvement in labor market participation, as well as some progress on inflation and inflation expectations after a long period of troubling weakness on both. These developments lead me to believe that our prudent risk-management approach has served us well this year, supporting continued gradual gains in employment and progress on inflation while helping to navigate a number of material risks.

Looking ahead, in view of the signs that there may be scope for further improvement in the labor market; the fact that inflation continues to run persistently below our target, which is

symmetric; the weakness in the PDFP components of spending data; and the presence of several important adverse medium-term risks coming from abroad, I believe it's prudent to wait for more evidence that we are near full employment and that inflation is going to be sustainably at our 2 percent target. In the weeks ahead, we'll have several important pieces of data in hand that will help with that assessment. Conversely, I've listened carefully, but I would be hard-pressed to identify convincing evidence that the economy is currently running hot.

When the Committee decides it is appropriate to take a step in removing policy accommodation, it will be important to emphasize, again, that the rate path forward is likely to remain gradual and shallow due to several key features of the post-crisis new normal. A combination of a neutral rate that looks to remain persistently low, the elevated sensitivity of the exchange rate to any perceived divergence in U.S. and foreign economic conditions, and somewhat greater room to run in the post-crisis labor market than had been anticipated suggests the amount of accommodation to be removed is likely to be relatively modest. I continue to be very concerned about the asymmetry in our ability to respond using conventional tools to counter shortfalls in demand relative to unexpectedly strong demand. This also suggests the value of removing that accommodation at a gradual pace.

As we look forward to a time when something akin to alternative C will be appropriate, I want to highlight two areas for consideration. First, as risk events emanating from Europe just since our September meeting remind us, we should be very cautious about characterizing risks to the outlook as balanced. Risks arising from developments abroad unquestionably remain tilted to the downside, and we've seen repeatedly over the past two years that global developments can importantly affect U.S. financial conditions and the outlook. As we've seen in Europe and Japan, proximity to the effective lower bound imposes important constraints on monetary policy,

limiting its ability to offset adverse demand shocks. So if we were to go further and characterize risks as fully balanced, as in the current alternative C, I believe we might be perceived as not adequately sensitive to important features of the current economic environment.

In addition, we haven't altered the language in paragraph 4 since December 2015. In the meantime, the Committee has significantly lowered its estimate of the longer-run neutral funds rate. In December 2015, when the sentences describing the future path were last modified, the median longer-run rate in the SEP was 3.5 percent. It is currently nearly $\frac{3}{4}$ percentage point lower. As a result, I believe it would be helpful to update paragraph 4 in alternative C to reference the lower projected level of the longer-run funds rate, reinforcing the message that interest rates are likely to rise only gradually and to a level likely well below previous norms. Thank you, Madam Chair.

CHAIR YELLEN. Thank you very much. Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you, Madam Chair. I support alternative B as written. I wanted the statement to suggest that we now have greater confidence about reaching our inflation objective, and I think we've accomplished that by the changes in the language in paragraph 3. I think that will be useful in reinforcing the notion that a December rate hike, barring some unforeseen change in the outlook, is likely.

At this juncture, I don't view a December rate hike as particularly risky in terms of provoking a sharp tightening in financial conditions, such as what happened in January this year, which followed our first rate hike last December. First, I don't think the market turbulence we had early this year was mainly attributable to that rate hike. But, second, and more important, unlike a year ago, market participants should now better recognize that we're not on a tightening campaign similar to what occurred during the period from 2004 to 2006. The median forecast

last December was for four rate hikes in 2016—we may get one, and the forward curve is very flat. The probability of tightening in December, based on January federal funds rate futures, has climbed to about 70 percent right now. That has not unnerved market participants. I find it hard to imagine that the last 30 percent of the probability, should we move, would have an outside effect in financial market conditions. So I think that we can do this without great fear that this is going to provoke an outsized market reaction. Thank you, Madam Chair.

CHAIR YELLEN. Okay. Thank you very much for a good discussion of the policy move for today. And we did solicit suggestions concerning alternative C, thinking that if we do move in December, it might be a draft. I've heard some further suggestions, and I would just say, as we come closer to December, that if things seem to be proceeding in a direction of a move and others have thoughts about what would be valuable to see in alternative C, I would really encourage you to contact us with ideas you may have. For now, I'd like to put up alternative B for a vote, with the language unchanged.

MR. MADIGAN. Thank you, Madam Chair. As you indicated, this vote will be on the draft statement for alternative B, as included on pages 6 and 7 of Thomas Laubach's briefing materials. It will also be on the directive to the Desk as included in the implementation note on page 10 of those briefing materials.

Chair Yellen	Yes
Vice Chairman Dudley	Yes
Governor Brainard	Yes
President Bullard	Yes
Governor Fischer	Yes
President George	No
President Mester	No
Governor Powell	Yes
President Rosengren	Yes
Governor Tarullo	Yes

MR. MADIGAN. Thank you.

CHAIR YELLEN. Okay. Thank you, everybody. It's still incredibly early.

MR. TARULLO. Hey, lunch is ready. [Laughter]

CHAIR YELLEN. For those of you who will still be here at 11:00, I believe 11:00 is the witching hour at which a buffet lunch will appear, so you're welcome to stay for that. And let me just say that the next meeting will be Tuesday and Wednesday, December 13 and 14.

END OF MEETING