

**Meeting of the Federal Open Market Committee on
July 26–27, 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, July 26, 2016, at 10:00 a.m. and continued on Wednesday, July 27, 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
Steven B. Kamin, Economist
Thomas Laubach, Economist
David W. Wilcox, Economist

Thomas A. Connors, Troy Davig, Michael P. Leahy, David E. Lebow, 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

Robert deV. Frierson, Secretary of the Board, Office of the Secretary, Board of
Governors

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

James A. Clouse, Deputy Director, Division of Monetary Affairs, Board of Governors; Daniel M. Covitz, Deputy Director, Division of Research and Statistics, Board of Governors

Andrew Figura, David Reifschneider, and Stacey Tevlin, Special Advisers to the Board, Office of Board Members, Board of Governors

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

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

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

Michael T. Kiley, Senior Adviser, Division of Research and Statistics, and Senior Associate Director, Division of Financial Stability, Board of Governors

Antulio N. Bomfim and Joyce K. Zickler, Senior Advisers, Division of Monetary Affairs, Board of Governors; Brian M. Doyle,³ Senior Adviser, Division of International Finance, Board of Governors

Jane E. Ihrig,³ Associate Director, Division of Monetary Affairs, Board of Governors

John J. Stevens, Deputy Associate Director, Division of Research and Statistics, Board of Governors

Glenn Follette and Steven A. Sharpe, Assistant Directors, Division of Research and Statistics, Board of Governors; Elizabeth Klee,³ Assistant Director, Division of Monetary Affairs, Board of Governors

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

Elmar Mertens, Principal Economist, Division of Monetary Affairs, Board of Governors

Valerie Hinojosa, Information Manager, Division of Monetary Affairs, Board of Governors

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

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

Marie Gooding, First Vice President, Federal Reserve Bank of Atlanta

David Altig and Ron Feldman, Executive Vice Presidents, Federal Reserve Banks of Atlanta and Minneapolis, respectively

Tobias Adrian, Michael Dotsey, Stephanie Heller, Susan McLaughlin,³ Julie Ann Remache,³ and John A. Weinberg, Senior Vice Presidents, Federal Reserve Banks of New York, Philadelphia, New York, New York, New York, and Richmond, respectively

John Duca, Jonas D. M. Fisher, Deborah L. Leonard,³ Antoine Martin,³ Ed Nosal,³ Anna Paulson,³ Joe Peek, and Patricia Zobel,³ Vice Presidents, Federal Reserve Banks of Dallas, Chicago, New York, New York, Chicago, Chicago, Boston, and New York, respectively

John Fernald, Senior Research Advisor, Federal Reserve Bank of San Francisco

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July 26 Session

CHAIR YELLEN. Okay. We are all a couple of minutes early, but it looks like we're ready to get going. Today's meeting, as usual, will be a joint meeting between the FOMC and the Board of Governors. So I need a motion to close the Board meeting.

MR. FISCHER. So moved.

CHAIR YELLEN. Thank you. Okay. We're going to begin with our first topic, "Long-Run Framework for Monetary Policy Implementation," and let me ask Simon to start us off on this.

MR. POTTER.¹ Thank you, Madam Chair. We will be referring to the materials titled "Long-Run Framework for Monetary Policy Implementation."

The briefing today summarizes the work of three foundational workgroups on the foreign experience, lessons from the crisis, and money markets that was distributed to the Committee over the past few weeks. As you know, this is a System-wide effort with important contributions from a number of divisions of the Board and all of the Reserve Banks. Today, in addition to the presenters at the table—Brian Doyle, David Altig, and Beth Klee—we have Patricia Zobel, Ed Nosal, and Susan McLaughlin seated behind us, who were the co-leads for these presenters. They'll also be available to answer questions.

In slide 3 of your rather thick presentation package, you can see the key goals of the project that were agreed to almost one year ago. These goals have obviously been influenced by the experience of advanced-economy central banks over the past 10 years or so. The foundational workgroups were designed to put this experience into a structure that will feed into the two framework workgroups, which are focused on interest rate targets, operating regimes, and the balance sheet. Our current plan is for the framework workgroups to present their findings at the November meeting. The feedback that you will provide today and in November will inform the staff's work on evaluating comprehensive frameworks that will be presented to the Committee further down the road.

The next slide shows an additional set of objectives for alternative operating frameworks. Objective 2 on promoting efficient, effective, and resilient money

¹ The materials used by Messrs. Potter, Doyle, and Altig and Ms. Klee and Remache are appended to this transcript (appendix 1).

markets will be an important focus of the presentation today. As also noted on this slide, the Committee’s normalization principles and plans provide an additional set of criteria when it comes to the size and composition of the SOMA portfolio. Brian will now present on the foreign experience.

MR. DOYLE. Thank you, Simon. To start our presentations, I’m going to talk about monetary policy implementation elsewhere in the world. The foreign experience workgroup, co-led by Patricia Zobel of the Federal Reserve Bank of New York, primarily surveyed the experience of nine advanced-economy central banks. As noted on slide 6, this survey included how central banks implemented policy before the crisis, how the frameworks evolved since then, and some of the rationale for those frameworks. In my limited time, I will just touch on some of the highlights from the memorandum that was circulated earlier.

As shown in your next slide, there is one finding that is perhaps useful to state right off the bat. We don’t see dramatic differences in most central banks’ ability to control short-term money market rates or to transmit effects of monetary policy out to longer-term interest rates. However, the wide variety of frameworks represents choices that central banks have made regarding how to achieve that control. And a better understanding of these choices may be helpful, as they reflect decisions that these central banks made regarding tradeoffs along other dimensions.

What are the primary differences in these frameworks? First, as noted in the first row of the table in slide 8, before the crisis, nearly all advanced-economy central banks communicated monetary policy with an overnight interest rate. But what that rate was varied some. A few central banks, like the Federal Reserve, used a target for a market rate. Many others used an administered rate—that is, a rate pertaining to some operation that they themselves set. Even in these latter cases, central banks often made reference to a market rate. The market rates were usually unsecured rates. In a couple of cases, however, they were secured rates.

As shown in your next slide, how central banks controlled money market rates also varied. Before the crisis, most used “corridor” regimes, supplying reserves to meet banks’ demand at the policy rate and generally using lending and deposit facilities to create a ceiling and a floor. Within this group, most central banks had some form of reserve requirements to foster a stable demand for reserves. A few central banks used “floor” regimes, providing sufficient liquidity for market rates to trade near the rate of interest that the central bank pays on deposits or reserves.

After the crisis began, how central banks implemented policy shifted. Unconventional policies, including large-scale asset programs not only of government, but in some cases private-sector assets; long-term funding programs, such as those of the ECB; and, most recently, negative interest rates, in some cases became the primary means of implementing and communicating policy. And, as indicated by the arrows in the chart, as central banks injected more liquidity under some of these programs, corridor systems in many instances became de facto floor systems.

As shown on the next slide, the distinctions between corridor and floor regimes have become blurred a little in recent years, as central banks changed how they remunerate reserves and gave banks a wider degree of choice over how many reserves to hold. To encourage interbank trading and reduce banks' hoarding of reserves, central banks using floors began to pay a lower rate on reserves above some threshold or quota—"tiered remuneration." This "tiering" is also similar to what has been seen more recently with negative policy rates at the Swiss National Bank and the Bank of Japan, albeit for a very different reason—that is, to limit the costs for banks of holding reserves. And, before the crisis, the Bank of England implemented a corridor regime in which banks could choose their own target for reserves—a "voluntary reserves target"—reducing some of the costs associated with reserve requirements.

These regimes influence the nature of activity in money markets, as highlighted on the next slide. Systems characterized by scarce excess reserves generally feature robust interbank trading. In floor systems that featured quotas, in conditions of still-abundant reserves, money market trading is largely between banks that are above their quotas and banks that are below. Likewise, currently in Japan and the United Kingdom, money market trading is largely between nonbank participants without access to remunerated accounts and banks with access. In these economies, as shown in the figure, money market rates trade below the rate on reserves, as is the case in the United States (the red line). Some central banks view arbitrage activity created by remuneration systems as meaningful and robust, while others view activity created by reserve scarcity as providing more insight into money market conditions.

Turning the page, another observation from the foreign experience is that central banks have added counterparties and accepted a wider range of collateral during the crisis (or already had broad sets of both) and expect to keep those broader sets. For some central banks, this broadening of counterparties has included nonbank entities, including financial market utilities. The main reason for the expansion during the crisis was a desire to provide liquidity to parts of the financial system that were "cut off." But some foreign central banks also see advantages in reducing competitive distortions created by conferring counterparty status on a narrow group and in the enhanced information that they receive about interacting with a number of institutions. That said, central banks acknowledge that broader policy comes with costs—increased operational costs, the potential to reduce private market activity—and that accepting a wider set of collateral could create some moral hazard if it encourages banks to hold riskier assets.

The next slide, slide 13, notes that a few central banks see liquidity insurance—the readiness to provide broad-based liquidity in the case of a shock—as distinct from either monetary policy implementation or emergency lending and have different operations to meet those separate objectives. The Bank of England views liquidity insurance as operations with clear criteria for use and broad access, and its scheme allows financial institutions to obtain reserves or liquid assets for less liquid assets. They view the clarity about the purpose of these operations as, it is hoped, reducing stigma and clarity about when these facilities would be used as limiting contagion

during stress events. That said, although some central banks provide greater clarity about their plans to employ such operations in stress events, others prefer some ambiguity about the circumstances of when they would use such operations.

Turning to your next slide, foreign central banks are still considering other features of their long-run frameworks. For example, most central banks think that they should be ready to use unconventional policies if needed and expect to maintain some operational preparedness. And central banks have diverse views about the appropriate size and composition of their balance sheets in the long run. Many central banks that have expanded their balance sheets with asset purchases in recent years hope to return to some form of smaller balance sheet in the future. But they also acknowledge that higher demand for reserves by banks may leave their balance sheets larger than before the crisis. Some have also noted that exceptionally large balance sheets can complicate relationships with fiscal authorities.

As highlighted in the final slide for this portion of the presentation, most central banks are still learning about how they should adapt policy implementation to the effects of new regulations. But one effect that most central banks do expect is that demand for reserves will increase. Excess reserves qualify as high-quality liquid assets (HQLA) under the Liquidity Coverage Ratio (LCR), and getting excess reserves for less liquid collateral (where possible) boosts the LCR. Central banks are split on how they should complement this effect. The Reserve Bank of Australia introduced a facility to help banks meet this demand in some instances, in part because Australia has a low stock of government debt. Other central banks will only take HQLA as collateral or are considering making changes to the costs of reserves to discourage banks from relying on the central bank to meet the LCR.

I'll now turn to Dave Altig, who will turn the focus back “stateside” and share some lessons from the crisis.

MR. ALTIG. Thanks, Brian. The task of the lessons from the financial crisis workgroup was to evaluate the performance of the Federal Reserve’s monetary policy implementation framework during the period of the financial crisis, which we defined as running from August 2007 to May 2009. Slide 17 provides several metrics pertaining to stress in various funding markets during this time frame.

There is disagreement among scholars as to the relative roles of illiquidity, counterparty concerns, and asset-risk repricing as drivers of these spreads, and in the memo, we review the research literature devoted to disentangling these effects. Our reading of the literature suggests that all three elements were at play during the crisis, but we emphasize that our analysis was not aimed at evaluating the necessity or the efficacy of specific tools. Our objective was to assess the efficacy of the pre-crisis framework in supporting the implementation of these tools once a policy course was chosen.

As described by slide 18, the pre-crisis framework can be summarized as follows: One, rate control was based on reserve scarcity. The level of excess reserves was

minimal, and the banking system operated on the downward-sloping part of its net demand curve. The Desk supplied reserves to meet demand through daily open market operations in order to manage the effective federal funds rate to the FOMC's target.

Two, liquidity was provided through two tools. Daily monetary policy operations provided liquidity to the banking system via repurchase agreements with primary dealers against government securities, and Reserve Banks made discount window, or primary credit, loans to individual depository institutions collateralized by a broad set of assets.

And, three, the portfolio was not a policy tool. The portfolio was simply a byproduct of the various activities the Federal Reserve undertook as part of its implementation framework. SOMA holdings were sized nearly equal to, and over time grew at the same rate as, the quantity of currency in circulation. The portfolio's size was maintained by reinvesting the proceeds of maturing securities; portfolio growth occurred through outright purchases of Treasury securities.

It's worth noting that before the crisis, stress events had been moderate in both the duration and scale of their effect on the Federal Reserve's balance sheet and had been managed adequately through the pre-crisis framework's combination of traditional open market operations and discount window lending. The 2007–09 crisis represented an unprecedented stress test of the pre-crisis framework. The nature of the pain points that were revealed and experience with new tools introduced to address these shortcomings form the foundation of our analysis.

I'll highlight five key takeaways from our review of the crisis. These lessons, many of which will be quite familiar, were informed by research studies, transcripts of FOMC meetings, archival MarketSource commentary, and the recollections of Federal Reserve staff actively involved in policy implementation during that time. Our list of lessons begins on slide 19 with the observation that, in the absence of IOER and adequate reserve draining tools, the pre-crisis "reserve scarcity" framework set up a tradeoff between interest-rate control and large-scale liquidity provision, a tension that persisted until that framework was effectively abandoned post-Lehman.

As the chart on this slide illustrates, most of the liquidity provision programs implemented over the course of the crisis represented additions to the Federal Reserve's balance sheet. In the absence of the ability to pay interest on reserves, maintaining rate control required the Open Market Desk to keep the level of reserves in a relatively narrow band. This meant that additions to reserves or liquidity arising from various liquidity programs required offsetting reductions in reserves, or "sterilization." Reserve draining prior to the crisis relied primarily on redemptions of maturing securities. This strategy for draining reserves became increasingly inadequate following the collapse of Bear Stearns, as redemption capacity hit its limit and liquidity programs expanded.

Our second conclusion, noted on the next slide, is that the two pre-crisis liquidity tools, open market operations and the discount window, were themselves not adequate to provide the type of large-scale liquidity insurance that was needed during the crisis. Open market operations and discount window lending were confined to limited sets of counterparties and, particularly in the case of open market operations, collateral types. Other tools had to be created to overcome their limitations—for example, highlighted in green text on this slide, the Term Auction Facility (or TAF) was introduced to circumvent the stigma problem associated with the discount window. FX swap lines with foreign central banks were activated to address broader global demand for dollar funding in order to contain spillover to domestic markets. The schematic on slide 20 emphasizes that the broadly based 13(3) facilities implemented in 2008, highlighted in blue text, supported policy transmission by reaching counterparties and collateral types beyond our normal monetary policy operating framework of the time.

The chart on slide 21 illustrates our third takeaway. Although the federal funds effective rate was successfully managed to the policy target for most of the period before Lehman, intraday rate volatility was elevated throughout the crisis period and posed an ongoing challenge to policy implementation. Intraday volatility emerged early in the crisis as aggressive foreign bank demand in the morning gave way to weak domestic demand in the afternoon. The primary credit rate turned out to be a very “leaky” ceiling; once implemented, the IOER turned out to be a leaky floor. The lack of a firm ceiling or floor complicated the day-to-day task of policy implementation.

Our fourth takeaway is spelled out on slide 22: The System was not well prepared to implement large-scale asset purchases once the funds rate hit the effective lower bound. In particular, there was a significant degree of “on-the-job learning” in order to develop a purchase program. The learning process and implementation took time, reflecting the lack of preexisting arrangements to support these transactions.

Finally, as also noted on slide 22, the pre-crisis framework was not sufficiently robust or flexible in the face of significant liquidity stress and disruptions to the monetary transmission mechanisms. For example, the growth of offshore intermediation in U.S. dollars shown on slide 23 and the expansion of nonbank intermediation shown on slide 24 introduced new linkages across market segments, which expanded the channels of monetary transmission. The pre-crisis framework was not designed with these secular developments in mind and proved inadequate when these new channels were disrupted.

Notably, the FOMC has already decided to retain standing swap arrangements with the Bank of England, the Bank of Canada, the Bank of Japan, the ECB, and the Swiss National Bank and has used them since the crisis period. Swap lines with these central banks have become part of the FOMC’s normal framework and represent an increase in the robustness of offshore market developments.

On slide 25, we summarize the timeline of tools implemented over the course of the crisis. As indicated by the darker bars representing instruments created over the course of the crisis, the Federal Reserve was innovative in designing and implementing new tools to address emerging liquidity problems. This, however, required venturing well beyond the core framework and investing heavily to overcome gaps in our existing knowledge and infrastructure. The System lacked the flexibility to pull nonstandard tools off the shelf to address unusual market stress. The *ad hoc* nature of the response to emerging stress prolonged the time it took to implement facilities in response and increased the System's exposure to operational risks.

I'll now turn the stage over to Beth Klee, who will summarize the work of the money markets group.

MS. KLEE. Thanks, Dave. As detailed on slide 27, we now turn our focus to the set of short-term wholesale funding markets often referred to as money markets. Money markets collectively help determine short-term interest rates and are a key link in monetary policy transmission. These markets were at the center of many of the problems that arose in the financial crisis.

To provide some background on the behavior of money markets, the next slide shows that prior to the financial crisis, major overnight money market rates—including those for CP, repo, federal funds, and Eurodollars—were highly correlated. Indeed, a statistical common factor can explain nearly 95 percent of the daily variation in these four interest rates from 2001 to 2006. In addition, money markets operated in a way that made it fairly easy for the Federal Reserve to implement monetary policy to keep the effective federal funds rate close to its target. In this way, the Federal Reserve's ability to influence rates in the federal funds market allowed it to strongly influence rates in these related markets.

As shown on the next slide, post-crisis, measured at high frequencies, money market rates may now be somewhat less tightly connected than in the past, although they still retain a high degree of pass-through. In particular, the share of daily variation explained by a common factor has declined to about 85 percent from 2010 to 2015, suggesting that there are somewhat looser linkages and greater dispersion across these money market rates than there were in the pre-crisis period.

Although it is difficult to identify precisely all of the factors that have led to this change in the behavior of money market rates, the memo focused on three. Specifically, as shown on slide 30, since the crisis, significant changes in the Federal Reserve's monetary policy implementation framework, the business practices of some market participants, and new regulations have left an imprint on money markets. Today we'll highlight a few key themes of the memo.

First, as noted on slide 31 and as Dave mentioned earlier, in the wake of the financial crisis, the Federal Reserve altered its policy implementation framework in a few key ways: Asset purchases contributed to a huge expansion of the Federal

Reserve's balance sheet and the volume of excess reserve balances held by the banking system. The Federal Reserve also implemented IOER, developed supplementary tools to support monetary policy implementation, and expanded the set of counterparties eligible to participate in reverse repurchase agreements.

As noted on the next slide, in part reflecting the increase in reserve balances, the character of trading in the federal funds market changed. Banks no longer needed to trade in the federal funds market to meet reserve requirements and manage payment flows because most banks found themselves flush with reserves. Instead, most federal funds trading today reflects arbitrage activity—that is, lending by FHLBs to banks and DIs, with the latter earning the IOER. Because FHLBs do not earn IOER, virtually all federal funds trades now take place at rates below the IOER rate. Still, the federal funds rate remains linked to other money market rates and has responded to changes in the Federal Reserve's administered rates. In particular, increasing the target range for the federal funds rate and raising the IOER and overnight RRP rates proved effective in lifting the constellation of money market rates in December 2015.

Nonbank financial institutions are active lenders in money markets, both to banks and to other nonbanks. As noted on slide 33, the introduction of the overnight RRP operations created an additional direct linkage between FOMC policy actions and nonbank financial institutions. Moreover, market participants suggest the overnight RRP is a relevant “comparator rate”—that is, a rate that provides a reference point for repo market participants. Furthermore, the volatility of triparty and primary-dealer-reported overnight repo rates declined with the introduction of the overnight RRP, and, more generally, the Federal Reserve's overnight RRP operations have established an effective floor on the level of repo rates.

The next slide highlights the second factor brought up in the memo, which is, namely, how changes in market participants' business practices have affected money markets. Specifically, many firms have become more cautious in managing credit, interest rate, and liquidity risks since the crisis. For example, Fannie Mae and Freddie Mac ceased their unsecured lending in the federal funds market. Fannie's and Freddie's withdrawal occurred amid acute stresses in European peripheral sovereign debt markets and perhaps reflected a desire to minimize these risk exposures.

The next slide notes the third factor that was brought up in the memo that has affected money markets: regulations. Since the crisis, a global regulatory reform program has put into place important new regulations to limit imprudent risk-taking, intended to increase the safety and resiliency of the financial system. Looking narrowly at money markets, the regulations that should have the greatest effect include the expanded FDIC base, the money market mutual fund reforms, and the Basel III regulatory changes, which include the supplementary leverage ratio, the liquidity coverage ratio, and the net stable funding ratio.

Against this backdrop, individual institutions may now find it less attractive to expand their balance sheets without a commensurate rise in capital and liquidity

positions. Consistent with this hypothesis, as shown on slide 36, the spread between the Treasury GCF and triparty repo rates has widened considerably since 2014. Absent frictions, arbitrage should ensure that these two rates should be identical. The wider spread reportedly in part reflects institutional frictions, which could include some tiering of rates for smaller dealers that generally have less access to direct lending from money fund counterparties. Under this scenario, larger dealers borrow from money market funds in the broader triparty market and lend the funds to smaller dealers in the GCF market. Because the initial borrowing expands the larger dealer's balance sheet, the GCF rate can rise notably above the triparty rate to compensate dealers for that expansion.

Slide 37 outlines some open issues regarding the future evolution of money markets and their connection to an implementation framework. Conversations with market participants suggest that the structural demand for reserves likely has increased significantly over the pre-crisis experience, and demand for reserves may also be more variable. The increased reserve demand stems from both precautionary and regulatory factors as well as changes in business practices. Of course, the effects of these factors on reserve demand are likely to be most pronounced if the Federal Reserve also remunerates excess reserves at rates close to the level of market interest rates. If underlying demand for reserves is much higher than in the past, there could be upward pressure on the level of short-term interest rates and a resumption of interbank trading in the federal funds market sooner than the point at which the staff's current projections involve an assumption that scarcity effects set in as a result of SOMA redemptions.

In addition, U.S. money markets may be more stable now than pre-crisis. This year there have been two episodes of stress in financial markets, and in both of these cases, U.S. money markets continued to operate well. Policymakers' views on the fundamental stability of money markets may inform their judgments about a range of issues associated with the long-run framework, including the size and composition of the Federal Reserve's balance sheet and the appropriate level of preparedness to provide liquidity on a large scale.

To summarize, as noted on slide 38, the new regulatory environment and changes in business models are factors that will likely have implications for various designs of the monetary policy framework that best achieves the FOMC's monetary policy objectives. Some important regulatory changes are not yet in place, and market participants may adjust their business models further in response. The monetary policy framework can be designed to support and enhance the benefits of the new regulatory approach in fostering a more resilient financial system with the understanding that a central bank's implementation framework is a critical determinant of behavior in money markets. I'll now turn the presentation over to Julie Remache.

MS. REMACHE. Thank you, Beth. Before turning the session over to your questions and comments and as a way to summarize our work, I'd like to highlight a few significant themes emerging from the work presented today as they relate to the

set of key goals for a future implementation framework. Simon began our presentation with these, and they are repeated for your reference on slide 40.

The first goal highlights the need for the framework to be robust during periods of financial stress and in response to structural changes in the financial system. The money market work highlighted many of the important regulations that have been put in place in recent years. As Beth noted, these regulations, which are meant to improve the stability of the financial system, require that financial institutions increase the amount of liquid assets that they hold to provide some measure of self-insurance. These regulations certainly increase the demand for high-quality liquid assets. And it's possible that they may also affect the demand for reserves—as Beth noted, particularly so if they are remunerated at a rate close to market rates. This may lead to a higher overall level of reserves than in the pre-crisis regime, leading the Federal Reserve's balance sheet to be somewhat larger, even if it were to return to a scarce reserves regime.

The second goal stipulates that the framework should allow the Federal Reserve to achieve its macroeconomic and financial stability objectives at the effective lower bound. The foreign experience work highlights a range of policy actions undertaken by other central banks, including the use of asset purchases, long-term funding programs, and negative rates. If the probability of revisiting the effective lower bound, perhaps routinely, in the future is reasonably high, and the duration of those visits is as long as the one we have just experienced, this will have a pronounced effect on the structure of the framework, including the set of tools that are chosen and the structure of the balance sheet.

The third goal stipulates that the framework should support the ability to address liquidity strains in money markets and to support financial stability. The work presented this morning highlights a range of issues related to the interaction of liquidity insurance and the monetary policy implementation framework. These included tradeoffs in the pre-crisis framework between providing liquidity to address marketwide stress and maintaining interest rate control, the role that liquidity insurance operations played during the crisis in supporting the transmission of policy rates, and the experience not only in the United States during the crisis, but also at other central banks subsequently, with the benefits of providing liquidity to a broader range of counterparties and against a wider set of collateral to support policy transmission. Of course, such potential benefits should be weighed against potential costs—which may include increased operational complexity and possible incentives created for counterparties to increase allocation to less liquid assets.

Thank you, Madam Chair. That completes our presentation.

CHAIR YELLEN. Thank you. Before we turn to Q&A on the presentations and papers, I'd like to take this opportunity to thank our presenters and all of the staff across the System who have contributed to this very extensive project. The documents we received for today's meeting

come from the foundational workgroups. And I believe they serve the very useful function of helping to establish a common understanding of our implementation framework, its evolution through the crisis, features of frameworks at foreign central banks, and the operation of money markets.

As described in the staff memos, our pre-crisis approach for implementing policy was not adequate for dealing with the severe disruptions caused by the financial crisis. In response, we made many innovations to provide liquidity to the financial system and to provide additional monetary policy accommodation once the federal funds rate was lowered to the effective lower bound. Some of these innovations remain key elements of our current framework. And, in thinking about our framework in the longer run, it's useful to recognize how much has changed since before the crisis.

To my mind, perhaps the most significant enhancement to our implementation framework has been the authority granted to us by the Congress to pay interest on reserve balances. The IOER effectively severed the link between the quantity of reserves in the banking system and the level of short-term interest rates. As a result, the tensions we faced in the early stages of the crisis between providing liquidity on a large scale and maintaining control of the federal funds rate is largely resolved. The ability to pay interest on reserves also helped enable us to employ another key policy tool—namely, large-scale asset purchases. LSAPs are an effective tool for providing monetary stimulus. But in the absence of a predictable means by which we can subsequently scale back policy accommodation as the economy recovers, of the kind made possible by IOER, LSAPs would carry greater risks—and, therefore, would be less effective.

Looking ahead, if the equilibrium federal funds rate remains lower in future decades than in past ones, the effective lower bound may bind more frequently. It seems likely, then, that

LSAPs will remain an important part of our toolkit to respond to the wide range of shocks we face.

A third innovation in our framework has been the establishment of standing swap lines with foreign central banks. These lines provide an important backstop with which to limit funding strains in offshore dollar funding markets. As we saw in the crisis, such strains can have material adverse effects on our financial system and the domestic economy.

Of course, the key objective of the long-run framework project is to identify changes that could further enhance our implementation framework, and I hope you will mention such areas in your remarks today. One area I would highlight is the discount window. We have long grappled with the problem of stigma, which interferes with the efficient provision of liquidity to depository institutions and prevents the primary credit facility from serving as an effective ceiling on the federal funds rate. As the experience of other countries shows, this need not be the case. This problem is an undesirable feature of our framework, and I believe it merits further attention.

Another shortcoming of our current framework is the inability of IOER to provide a firm floor on the federal funds rate. Our supplementary tools—notably, the overnight RRP as well as our term draining tools—may well give us all the control we need over short-term interest rates from a macroeconomic perspective. But having the market-determined level of the federal funds rate and other overnight rates trade below IOER contributes to the impression that banks are getting a special deal with us. That impression is amplified by the very large amount of reserves in the banking system and the associated large payments to commercial banks of interest on their reserve balances. It's easy to explain why we have such a configuration of interest rates, due to the elevated level of reserves in the banking system. But it does put us in a defensive position.

So let me stop there. We have allocated plenty of time today for a good discussion, so please feel free to ask a lot of questions and to make comments. I know that the staff would appreciate hearing your thoughts about the direction of future work. At the November FOMC meeting, we will have an opportunity to discuss the work of the framework workgroups, which are examining interest rate targets, operating regimes, and balance sheet policies. While I don't anticipate that we will need to make critical decisions about our longer-run framework anytime soon, I hope that this discussion and our next one will better position us for that eventuality.

Let's now open the floor for questions to the staff, and after the Q&A, we will have an opportunity to comment for anyone who would like to do so. Vice Chairman.

VICE CHAIRMAN DUDLEY. I have a question, and I don't know that the staff has the answer to it or that I have an answer to it. The framework objectives basically imply that this is about monetary policy implementation, it's about financial stability, and it implies that financial stability is important in terms of thinking about what the right framework is. But then, when we come down to the Policy Normalization Principles and Plans, a framework should involve holding "no more securities than necessary to implement monetary policy efficiently and effectively." So one seems narrower than the other, and I just was wondering how the staff was thinking about that. Let's imagine that we have a monetary policy framework that has huge benefits for financial stability but might require somewhat more securities. Do we think that the policy normalization principles are cast in stone, or could they be potentially modified? I just would like the staff's view on this.

MR. POTTER. I'm not sure that's a question for the staff. [Laughter]

VICE CHAIRMAN DUDLEY. Let me ask it this way: Is there a tension between these two things? They do seem a little bit in opposition to one another. And I think it would be

interesting, as we discuss this, to decide: Do we really believe the framework should be broad and include financial-stability objectives, or should it be narrow and just focused on monetary policy implementation?

MR. TARULLO. Madam Chair. My recollection, Vice Chairman Dudley, is that when we were talking about that stated principle of normalization, there was a little bit of back-and-forth within the Committee, basically saying that's an issue that does have some tension in it because you could interpret effective monetary policy as meaning: You don't want a monetary policy that creates financial instability, because that would require reactions later. But my recollection is, we self-consciously tabled the tensions inherent in that issue, and so my sense was that it's precisely one of the things that this exercise is going to have to address.

VICE CHAIRMAN DUDLEY. Yes. I just wanted to get that out on the table.

CHAIR YELLEN. Questions for the presenters? Let me see, President Rosengren.

MR. ROSENGREN. My question is on the international side, and it relates to one of the things that came out of the crisis, nonbank SIFIs, which wasn't something that most countries were thinking about before the crisis. For most countries, those were insurance companies and broker-dealers, depending on whether they were included or not included in commercial banks. Do other countries make liquidity available to anybody classified as a SIFI? Are we unique in that respect, or is that fairly common internationally? So, for example, we had GE, we have insurance companies, and we're viewing them as systemically-important institutions, but we're not giving them access to the discount window, which presumably means that even though they are systemically important, we're not worried about liquidity problems with those organizations or we're choosing not to address that. Are we unique among the countries that you interviewed, or perhaps this may be a little too institutional?

MR. DOYLE. No, not at all. There are some central banks that have extended their counterparties beyond banks, even beyond broker-dealers. The Bank of England is one example that has, in effect, explicitly said: Our framework is to give liquidity insurance to anyone we feel is systemically important for liquidity, subject to liquidity shocks, and is adequately regulated. And so the Bank of England allows, for example, for CCPs. Another case is the Swiss National Bank's inclusion of insurance companies, although I am not sure whether it is explicitly thinking about SIFIs. In fact, the Swiss National Bank also includes banks that aren't actually operating in Switzerland but might be operating in Swiss franc markets. So it takes regulation in the euro area, regulation in the United Kingdom, as being adequate for its purposes in order to lend to those institutions.

MR. ROSENGREN. Thank you.

CHAIR YELLEN. President Lacker.

MR. LACKER. Yes. Thank you, Madam Chair. I have two questions. One is for Dave Altig. This has to do with the narrative about the lessons of the crisis. The paper, I think early, mentions sales of U.S. government securities and the extent to which we resorted to that to sterilize and offset the effect of lending programs on aggregate reserves, in order to avoid driving interest rates down. Then, later on, the paper seems to drop that option and says we didn't have any way to do that. And my sense from the narrative is that we didn't sell all the securities we could have, and it wasn't clear why not. Now, I know some were pledged or lent out in the TSLF, right? But my sense is, not all of them, but I guess I could look that up. Did we sell or encumber all of the U.S. Treasury securities we could have? If we didn't, why did we stop short of selling U.S. government securities at the time we did?

MS. MCLAUGHLIN. We sold quite a few securities. Between March and May of 2008, we sold about \$8 billion or \$9 billion in bills, which is about 45 percent of the holdings at that time. That's actually after we had redeemed a substantial number of securities in the run-up to the Bear Stearns time frame. We also sold about \$55 billion in coupon securities, which represented about 12 percent of our holdings. So we had run down a fair amount of the portfolio, and then in that March and May period, we sold another very sizable chunk. It's true that we didn't sell all of them, and it's also true, as you noted, that some of the securities we needed to hold, in part because those securities were serving as collateral or lend-out securities for programs like the TSLF.

MR. LACKER. So there were a couple hundred billion we could have sold?

MS. MCLAUGHLIN. Yes. I don't have the exact numbers. There were some securities. They were, I believe, principally long-duration securities.

VICE CHAIRMAN DUDLEY. Isn't the point, though, that we didn't need to sell them because we hadn't added sufficient reserves that we had to offset?

MR. LACKER. Well, there's this point at which we did, right?

VICE CHAIRMAN DUDLEY. No, no. I know, I know. But the point is, at the time, we were basically saying, "Well, we can sell securities, and we can expand our liquidity provisions, but we don't want to be too aggressive in terms of our liquidity provision, because then we might have to sell a whole lot of securities, and then we're not sure what the market effect is going to be." So we basically were very conscious of how the liquidity provisions were going to add reserves to the banking system and our ability to actually offset that by draining. Now, we did sell securities, because that's what we had to do to offset the reserves that we added.

MR. LACKER. Right.

VICE CHAIRMAN DUDLEY. We didn't do more because that's the volume of reserves we essentially had issued.

MR. POTTER. So I think your point, President Lacker, might be that the Desk could have sold all of the outright and just run a repo book. That repo book would have been more flexible, and that would have perhaps given you three or four days in September 2008.

VICE CHAIRMAN DUDLEY. We would have had more capacity.

MR. LACKER. So let me see if I get this straight. Before this chart does the hockey-stick thing on page 19, no question, we sold what we did, and we sterilized effectively. I'm not disputing that. But the assessment that comes out—and, Madam Chair, you repeated this—that our crisis framework was inadequate for the liquidity provision. I just want to pinpoint in what way it was.

VICE CHAIRMAN DUDLEY. We could have built up more capacity.

MR. LACKER. Is that resting on the notion that we didn't have enough securities to sell—following what happened after October 2008, in view of the reserve injections that occurred after that, in light of the lending that occurred after that? We didn't have enough securities to sell—is that the idea?

VICE CHAIRMAN DUDLEY. Well, there is the gap between September and October when the TARP legislation gives us the authority to pay interest on reserves? It's really during that month that we were exposed.

MR. LACKER. Right.

MR. POTTER. Well, there's clearly that. There is the issue in the spring and the summer of 2008 when the TAF and swaps were there, but they had a limit on the usage. We've had a long discussion on this. I don't think this was the first binding constraint in policymakers'

minds, but from the operational perspective, when Vice Chairman Dudley and his staff were thinking through about how to describe for you what we could do, they were constantly thinking at the back of their minds, “We have to be careful here, because there’s only a limited amount we can do if we have a lot of usage of, say, the TAF, or the swaps, to control the federal funds rate.” And the federal funds rate was well above zero. It was about 2¼ percent at that time.

MR. LACKER. Well, then we could have sold more securities outright, right?

MR. POTTER. Exactly. The Desk could have come to you and said, “Over the next few months, we are now going to liquidate all of the Treasury portfolio, run a repo book, and that will give you more flexibility to size up these programs.”

MR. LACKER. But, even short of that, I don’t see what the problem would have been then.

VICE CHAIRMAN DUDLEY. Part of the issue is, you don’t have foresight about what’s going to come. You don’t know that Lehman weekend is coming down the road, right? You could sell a lot of securities to build up your capacity, but then you have the cost of how that could potentially disrupt the Treasury securities market, and do you want to do that or not?

MR. LACKER. Well, we were lowering rates.

VICE CHAIRMAN DUDLEY. Right. Selling bills and short-dated coupon securities is probably not going to have much effect on the Treasury securities market or the Treasury yield curve, but if we had sold a lot of longer-dated Treasur securities, I think there’s a question of what that would do to the market. It’s a judgment call.

MR. POTTER. I think if we look back, there are many things we would have done in a different way.

VICE CHAIRMAN DUDLEY. Oh, absolutely.

MR. POTTER. That's certainly true, but from the interviews that we've done, this was a constraint in people's minds. I don't think it was a primary constraint in policymakers' minds. For them, there were a lot of issues—moral hazard and dealing with whether we could have such large programs and what that would look like. Optically, that ended in the middle of September 2008.

CHAIR YELLEN. Didn't the Treasury come along and help us manage this problem substantially by running up its own balances?

VICE CHAIRMAN DUDLEY. Correct, and it helped drain reserves by holding more.

CHAIR YELLEN. And that was before October?

VICE CHAIRMAN DUDLEY. Yes.

MR. LACKER. I have a second question. It's for Beth Klee. In your presentation, you talked about linkages, and this shows up in the paper, too. There's this graph on slide 28 that shows pre-crisis rates are highly correlated, and then on slide 29 it says that rates may be less connected at high frequencies. On 28, all the rates are really close to each other and the lines kind of overlap, and then on 29, they wiggle around a lot and they're far apart. But then, the scales are different. To your credit and in all fairness, you cite, I think, some econometric work, something about what fraction of variance is explained by a common factor.

MS. KLEE. Yes. That's just doing a simple principal component analysis.

MR. LACKER. Okay. So when I look the one on 28, the pre-crisis, and I think about a common factor there, I'm thinking, that would be us, right, moving interest rates around?

MS. KLEE. Yes.

MR. LACKER. And then in your second sample, we're not moving interest rates around much at all. We do it once at the end. You're not going to get the federal funds rate target or

some policy rate as being the common factor. So, you'd expect the fraction of variance explained by the common factor to go down, right, and that would not to really reflect any difference in meaningful linkages or the extent to which market rates would move if we raised rates as much as we did on slide 28. Is that intuition correct, Beth?

MS. KLEE. I think it is to some degree. It's basically a statistical exercise—it's pretty agnostic. I think that you're going to see the rates travel more together if you have the policy rates moving things, and so, therefore, that will explain more. To be technical about it: We take out the mean. We control for these kinds of things, but—

MR. LACKER. You don't take out the movement in the funds rate.

MS. KLEE. No, we don't take out the movement in the funds rate.

MR. LACKER. Okay.

MS. KLEE. But in terms of the behavior of the constellation of rates when you move, let's say, either the federal funds rate target or, in this case, the administered rates, in both cases the constellation of money market rates moved up. And so is 95 percent very different from 85 percent, particularly when you're at the effective lower bound? That's probably a judgment call.

MR. LACKER. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Fisher.

MR. FISCHER. Thank you, Madam Chair. Somebody said earlier that they weren't sure they should raise this issue, and I'm not sure I should raise this issue except that it's important. The big thing that happened last time was at the time of the failure of Lehman Brothers. And that made a difference to the entire world. Now, there's nothing as far as I can see that prevents us coming to a day on which we don't have a tool to deal with a similar situation. So what are we going to do on that day?

MR. TARULLO. Are you waiting for an answer, sir?

MR. FISCHER. Well, the question I'm raising is what are we allowed to do?

CHAIR YELLEN. Do you mean what facilities do we have?

MR. FISCHER. Yes, Are we allowed to go to the FDIC and start putting this institution into bankruptcy or at least into the FDIC's care, with some hope that we've done enough work that will enable us to prevent that having massive repercussions?

CHAIR YELLEN. Under Title 2?

MR. FISCHER. Under Title 2.

CHAIR YELLEN. And the FDIC has the ability to tap liquidity and lend to that institution.

MR. FISCHER. Yes.

CHAIR YELLEN. We still have 13(3) powers to put in place broad-based programs if it's not a single institution.

MR. FISCHER. Yes, well, if we had five Lehmans, we would have had a bigger problem.

MR. POTTER. Five investment banks.

MR. LAUBACH. But, Governor Fischer, just to be clear, for the purpose of this project, we decided deliberately—and I believe also with your blessing—that we would actually stay away from the explicit evaluation of, for example, 13(3) facilities, because we felt that they were not part of a normal implementation framework. Now, as you saw from the material, clearly there is a bit of a gray area here, in the sense that you cannot completely exclude the topic of liquidity provision, because it turns out that liquidity provision and the implementation framework are very closely tied. That said, I think what our work here has primarily focused on

are questions such as, If you had to greatly expand the provision of liquidity, how would you still be able to control short-term interest rates in order to implement the particular chosen stance for monetary policy?

I'm afraid that it was by design that this project was not intended to address the question that you just raised.

MR. FISCHER. That's clear, and if I agreed with that some time ago, then I plead guilty. But, at some point, we're going to have to look at this issue. We've got a plan, which is not entirely "fair weather" sailing, but there are things that it doesn't quite go into in the same depth that it might. We've got to find a way of doing the best we can to figure out what we would do in similar circumstances because they can quite well arise. It's not that we banned them by saying that you got rid of too-big-to-fail. If somebody eventually says "yes," then it's gone, but that hasn't happened, so we had better come back to it in some way, shape, or form, with the attendant political difficulties being taken into account. It's a very tough issue, as I'm sure I don't have to say.

CHAIR YELLEN. And our powers have been restricted in Dodd-Frank, but we still do have substantial 13(3) powers to create facilities to address strains, and in Dodd-Frank we got the ability, if we deemed it important, to lend to a CCP or a designated financial market utility if it encountered strains, which could be a different kind of problem that afflicts the financial system. We're not completely without powers, but they're certainly not as broad as some other countries have and have regularly put into effect.

MR. FISCHER. Okay.

CHAIR YELLEN. Other questions for the staff? President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. Sorry for the second question.

CHAIR YELLEN. Please feel free. We've got a lot of time.

MR. ROSENGREN. This is an international question again. I'm looking at slide 8 on the policy rates and the distinction between market and administered rates, and it's striking how many chose administered rates rather than market rates. When I think of the IOER, it's a leaky floor, which is, in some sense, by design. It's a leaky floor because we didn't give nonbanks access to the administered rate. Are there any other central banks that chose to have a leaky floor by design?

In some sense, you could view us as having an administered rate, because it's really weird that only the GSEs are trading in the federal funds market. So we've created, kind of by design, an artificial market that's very tied to the administered rate. The arbitrage works through foreign banks, but because of the FDIC, they're getting arbitrage profits relative to the GSEs, which are government entities. It's kind of a weird set of constraints that we've imposed to make this a market. In some sense, I'd be interested whether anybody else has this kind of characteristic. Are all of these administered rates truly administered rates, or is what they've done to avoid leaky floors to allow other people to participate in the administered rate besides depositories?

MR. DOYLE. If you turn to slide 11, I don't know if they tried to do this by design or not, but you can see in the case of both the Bank of England, which is depicted in the purple line, and the Bank of Japan, shown in the dark blue line, money market rates are trading far below their floor. And that includes some nonbank participants who are not part of or don't have access to accounts that get remunerated trading with banks that do have access. So it is this sort of arbitrage activity. I don't know whether it's by design or not.

MR. ROSENGREN. So those are administered rates or market rates when they have those examples. That's similar to us, right?

MR. DOYLE. In both of these cases, they are administered rates.

MR. POTTER. I don't think they have a government-sponsored enterprise that has an account at the central bank that can run transactions through that account but is not eligible to earn that central bank rate. That is somewhat different, and it affects the federal funds market. If you paid out to the GSEs, the federal funds rate would likely then trade above the effective rate where the IOER is. Remember, that market is relatively small compared with the Eurodollar market in which the nonbanks, which are the money funds, are much bigger transactors. You'd still have that wedge, and that's really what you see in the United Kingdom and Japan.

MR. DOYLE. This is a conjecture. I also don't know if the statement is 100 percent true. It is the case that you see that the rates trade not as below the floor in the case of the BOJ and BOE. And that may be due to their having a broader set of counterparties, and it may also be due to their having a much smaller nonbank sector. But, you know, that's a conjecture.

MR. ROSENGREN. Thank you.

CHAIR YELLEN. Other questions? Governor Fischer.

MR. FISCHER. On page 12, there's a discussion about liquidity provision to a broader range of institutions, and then there's bullet 4, which is that central banks see advantages to having a more level playing field and to getting information about the institutions to which they are lending, but that we need to be worried about moral hazard. That's not written—that was said. As far as I can see—and I think you said this in the written paper—the Bank of England, for instance, has just tried to get rid of the moral-hazard aspects in the way it has set up these facilities, or something like these facilities. And the question is, should we be saying, well, in

essence, moral hazard is a barrier that we can't overcome, or should we try to think of institutional arrangements like the Bank of England has developed?

MR. DOYLE. One thing that a number of foreign banks expressed was that getting at moral hazard might be more of a supervisory and regulatory issue than an issue for liquidity insurance.

MR. TARULLO. But, of course, the Bank of England is the supervisor.

MR. DOYLE. Yes. So they would try to use those powers, although they were not the supervisor, necessarily, in all instances, I guess.

MR. TARULLO. They are the only prudential supervisor.

MR. DOYLE. Okay. They are now. Yes, you're right, I'm sorry.

MR. POTTER. That wasn't the case partly when they designed this, but that's the situation now.

MR. DOYLE. Now.

MR. POTTER. It's also true that that's the change at the ECB.

MR. DOYLE. Although, in the case of the ECB, they don't have the broadest set of counterparties.

CHAIR YELLEN. President Kaplan.

MR. KAPLAN. I'll get to this in the comments, but I gathered in reading all this—which I thought was very well done and obviously very helpful for me—that while you didn't address some of the sensitivity about what powers we have and don't have, you laid it out so that part of the guidance we can offer in our comments should be: What should we have? And then we can have a separate discussion about how to get from here to there? And the BOE is the one that naturally you gravitate toward, because what they have—and we'll get to this later—seems like a

good thing to have. The issue here I gather is: How do we get to where we actually have the ability to do the same thing the Bank of England does? I take it that's a little trickier question.

MR. POTTER. My view is that the law, especially the Federal Reserve Act, is what we take. It gives the Federal Reserve tremendous power. Before the crisis, the Bank of England operated in a way that was much narrower in terms of the collateral that they would take. The discount window will take a range of collateral, which is very wide compared with most central banks.

MR. KAPLAN. So we might actually have the power.

MR. POTTER. There, you limit the type of counterparties. With open market operations, if you're prepared to narrow to a particular type of collateral, you can have a wide range of counterparties.

MR. KAPLAN. Okay.

MR. POTTER. Within that construction, subject to some really important issues, whatever decisions that you take, you have to think about the incentives you are putting into money markets and about the financial institutions there. We can't just be thinking of the case of how would we lend a lot of money at a certain time? We have to think of how likely we are to get to that situation, because we have incentives in place for those folks to take risks, because they know that the Federal Reserve is there.

MR. KAPLAN. But that's why we're doing this exercise, to think through these things in advance, right?

MR. POTTER. It's part of the reason, yes.

MR. DOYLE. I guess I'd only add that part of the reason we cite the Bank of England frequently is that it is a central bank that has done a lot of thinking and enacted a lot of change

from where it was pre-2006, even before the crisis. The BOE changed its system before the crisis, and we saw a lot of evolution during the crisis. Because they've done a lot of thinking, it's a lot of grist in the mill.

MR. KAPLAN. Thank you.

CHAIR YELLEN. Okay. Any further questions?

MR. LACKER. Madam Chair—

CHAIR YELLEN. President Lacker.

MR. LACKER. Yes. Let me just add a comment to echo what Thomas Laubach said. We have the luxury now of separating questions of monetary control and interest rate control from credit extension. When we were founded, the founders made a choice to combine those two, and it was based on the monetary system at the time of the gold standard and the fact that government finance, if it was monetized, tended to be associated with wartime departures from the gold standard and inflation—or, if done in peacetime, associated with inflation. The founders explicitly chose not to focus on government-debt backing for the money we would issue but instead used the discount window in its mechanism. Very rapidly after that, we got plenty of government securities, and we've figured out over the last century how to run central banks with a portfolio in which the money they issue is backed by government securities and without having that be inflationary. It was for a time in the '70s, but it isn't now.

But that gives us the luxury of separating granting credit to the private sector from how much liquidity we provide—and I use that word in the sense of our monetary liabilities that we provide to the system. Now, liquidity is also used in these papers—a little sloppily—to refer to credit extension, in which you are lending somebody those assets. To provide them to the system, people can exchange assets to acquire our liabilities. But that's not the same as our

lending them to them. That division we can do, and so I think, on Thomas's point, either we separate thinking about liquidity provision and liquidity extension from monetary control or we don't. And if we are going to go down the road of combining the two, using credit extension as part of monetary control, opens up a big can of worms. But I would just put in a pitch for keeping those separate in our discussions.

CHAIR YELLEN. President Bullard.

MR. BULLARD. I have a follow-up for President Lacker. Could you elaborate on what you mean? Because I took the point of the memos to be that these are not really separable things, and therefore we have to design a system that appropriately balances the ability to provide monetary control and the ability to provide liquidity in a crisis. And you just said, you could separate these two things. So, what do you mean?

MR. LACKER. Well, I was going to get to this in my prepared remarks. At the risk of some perseveration, I'll just say that what I am proposing is a very simple regime in which we pay interest on reserves and ignore everything else in the world—not ignore it, but don't adopt an explicit target for the funds rate, just drop that. Our policy rate is our administered rate, and that's it. And we count on arbitrage, as we do now, to align rates with that. So that's a crisp, pure polar model, and in that world, you know, our balance sheet can be whatever it is.

MR. BULLARD. Okay. So the point would be, it's an administered rate.

MR. LACKER. Right. In that simple regime there doesn't seem to be any tension between monetary control and credit extension, right? We can extend credit, and we keep the IOER where it is, and arbitrage presumably keeps everything where it is. So we don't have to sterilize anything. We just don't have an issue. So the tension doesn't arise in that scenario.

MR. BULLARD. Okay. So your point would be that a lot hinges on an administered rate versus a market rate?

MR. LACKER. Right. An administered rate with a floor. With other systems, like reserve scarcity systems, you have to sterilize things. You have to deal with this issue. That was the point—that, if there is going to be a tension, if the staff is going to ask us to consider something in which there is some tradeoff, we haven't seen a serious *ex post* review of our credit programs. They are going to be asking us to make some choice, on the basis of the costs and benefits of preparedness for liquidity provision programs, credit extension programs. I think we would want something about the economic advantages and disadvantages of various levels of preparedness for credit extension by a central bank. So I previewed my comments there.

MR. BULLARD. Thank you.

MR. LACKER. Certainly.

CHAIR YELLEN. Okay. A number of people have asked to comment. If others who are not on this list wish to be added, just let us know. Let's begin our comment opportunity with the Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you. I think we all have to agree that the staff have given us a lot to digest, and there's obviously going to be much more to come on this. I thought this round of work was very thorough and thoughtful. So thank you for that.

That said, I do think it's extraordinarily premature to make any strong assertions about what the long-run framework should look like at this point because I think there's a lot more work and assessment to do before we reach that point. As I see it, this is a very big and complex subject, and, speaking for myself, I am going to need some time to get my head fully around the

key issues and the potential alternatives and tradeoffs. Nevertheless, I'd like to make a couple of comments at this very early stage.

My first comment, which is consistent with the framework objectives that were laid out for us, is that we need to pick a framework that's not just best suited for monetary policy execution, but that is also best suited to achieving our financial-stability objectives. I can imagine a framework that had significant financial-stability benefits—because it included a broader set of counterparties, or it had stronger liquidity backstops, or it had liquidity backstops that had less stigma—but it might be a little bit more complex than a simpler system might be in terms of monetary policy execution. I might be willing to accept a little bit more complicated, elaborate monetary policy execution in exchange for those financial stability benefits. So I think we want to cast the net large and understand that we're maximizing across both of these regimes, monetary policy implementation and financial stability.

The second point is that, as the SOMA manager in 2007 and 2008, I don't disagree with anything the staff said. I thought the lessons of the financial crisis with respect to monetary policy implementation are pretty clear. The setup then was not well suited for providing liquidity to the system. We did encounter a conflict between the goal of supplying liquidity and maintaining monetary control in 2007 and much of 2008. We didn't move to particularly large liquidity-assisted programs because we were worried about the consequences of that for reserves. Only quite late in the fall of 2008, with the TARP legislation, did we get the opportunity to move to the interest-on-reserves framework under which, in my mind, we were finally able to establish credible, broad backstops without the risk of losing monetary policy control. And, if you think about it, the crisis might have been less severe if we had been able to put such broad, open-ended backstops in place sooner. We couldn't do that because we were worried about monetary policy

control, but if we had had broad, credible backstops in place, I think there would have been less incentive for counterparties to pull away because they'd know that there would have been a way of getting cash back at the end of the day. Also, I think there were a number of other problems that I'd like to avoid in the future. I think the stigma associated with the discount window borrowing, which the Chair talked about, was a huge problem. To me, another problem that came up during the crisis that we need to consider was that we did supply a lot of liquidity to the banking system, but that was not necessarily lent on to other important parts of the financial system. In a hybrid system like we have—banks, nonbanks, a pretty big capital market—how do we have a system to ensure that the credit actually gets to the people that need it? Getting it to the banks may not be sufficient.

The third point I would just make is, although it's still in the early day to reach firm conclusions, I have to say that my current inclination is not to go back to the corridor system that we had before the crisis. I viewed that as operationally cumbersome and at times ineffective at keeping the federal funds rate where we want it to be. I remember the fact that we had these fluctuations in the federal funds rate within a given day—higher in the morning in Europe and then lower later in the day. You know, that was probably not a big problem in terms of effective monetary policy, but then in September 2008, it actually got worse. We had difficulty keeping the federal funds rate close to our target right after the Lehman Brothers failure. At the same time, I don't think we want or need to operate a regime in which the Federal Reserve has the kind of extraordinary large balance sheet as it does today. I think the benefits of a floor system can be achieved with a much smaller balance sheet.

The fourth point I would make is, I hope we all just remain open minded about where all this is going. This means being open minded not just about the framework, but also not

prematurely ruling out seeking other changes that might make a particular monetary policy originally more effective. For example, I can imagine that after all the work is done, we can conclude that seeking changes to the leverage ratio requirements that might exempt bank reserve holdings with the Federal Reserve from the leverage-ratio calculation or seeking changes via legislation or via regulation that would change our set of counterparties might result in a more effective monetary policy regime, and I don't think we should necessarily rule them out *ex ante*. We should consider them carefully—What's the benefit of trying to push down these certain avenues against some of the constraints that we face?—and see if that's worth it or not.

I also think changing our target from the federal funds rate to some other rate is certainly something we should consider. I think an interesting open question is: What are the pros and cons of targeting an administered rate versus a market rate? I frankly don't see a particular benefit of targeting a market rate. If you target an administered rate and the market rates move consistently with that administered rate, it seem to me like an administered rate works just fine. But I'd like that issue developed a little bit more fully.

Finally, I do think there are some important issues that could be more fully developed. One thing that runs through the memo is this issue of interbank activity in the money markets. I guess I have a fundamental question: In and of itself, is interbank activity in the money market a good thing? When I step back and consider it at a little higher level, we want a financial system that allows efficient intermediation between savers and borrowers. In an ideal system, savers meet borrowers. There's no need for anybody in the middle. They meet, and they exchange. We're all done. It seems to me that having a view that we want interbank money market activity means we're actually putting more stuff in the middle, more cost and more complexity, which might not necessarily be a good thing. So I'm not sure that interbank activity is necessarily a

good thing. I wouldn't go in a priori thinking that's a positive, and I'd like to see more work on that.

The second issue I thought that would be interesting to explore a little further is whether the issuance of Federal Reserve bills is in scope for this project. It seems to me that Federal Reserve bills have a lot of advantages. You'd have a much broader set of counterparties. It would drain reserves, and we could drain as much of reserves as we want. It would allow us to lean much less heavily on the interest on excess reserves so that you could get away from the idea that we're favoring banks. So it seems to me that the Federal Reserve bill issuance is probably worth some consideration.

And then the final meta questions I have are: How does the framework influence the size of the banking system versus the nonbank system, and how is that relevant to financial stability? We're going to make choices that could either encourage the banking system to grow because we're providing benefit to being a bank, or we could offer a system that makes being a bank a little bit less attractive, and so banks could shrink. So I think we need to think about how we treat banks versus nonbanks as we go through this process and how that's likely to affect the future evolution of the financial system. Thank you.

CHAIR YELLEN. Thank you. President Williams.

MR. WILLIAMS. Thank you, Madam Chair. I agree with your opening remarks that this is very useful material. Even though I've been in the Federal Reserve throughout this period, it was nice to have all of the documents together, highlighting the key issues and open questions.

In terms of open questions, the thing that struck me in reading through the very thorough memos—and I agree here with the Vice Chairman—was the sense that there are still the same

open questions today that we had the last time we discussed this. One example is how regulations—especially in money market funds, in banking—will affect the demand for reserves or affect relative activity in money markets and interest rates and things like that. That’s still an ongoing process, so I think there’s time for us to learn more from that.

Another open question—and I do have a solution for this, but maybe I’ll save it for tomorrow—is that we haven’t really progressed very far on policy normalization. [Laughter] Some of the big questions we had were on the role of the ON RRP and its size: what the scale of the ON RRP will be as we raise interest rates and how that will affect market conditions. We started with this very open-ended, large approach to the program so that we could have very good interest rate control. That’s been successful, but I still think we have a lot to learn as we do raise rates about how that will actually function and the pros and cons of that.

So like the Vice Chairman commented, I think it is premature to come to conclusions either here or November. In fact, I guess my main point I would like to make is, I’m worried a little bit about the timeline here. It’s great that we have a discussion today and maybe in November to intellectually think about these issues. In view of some of the uncertainties and questions that will still be open, I’m just not sure whether we’re going to have the information we need even in 2017, which is when, I think, we’re supposed to have the kind of meeting at which we actually try to come to agreement on some of this. I guess my one bit of advice is not to try to hold to some fixed timeline in coming to decisions, but to have that be on the basis of what we’ve learned and the events, say, over the next year.

Going back to the issue that Governor Fischer and others have brought up in their questions, I do think, in setting up this new framework, we need to consider seriously what we think the risks are and what the distribution of the risks that we’re worried about is. In normal

times, I think any framework works fine. [Laughter] I think that's the international experience. It doesn't matter in normal times how we do monetary policy. It's fine. The issues that you really want to think about the situations that are either very stressful from a financial-sector point of view, the zero lower bound, negative interest rates. And I think that does force us to actually think about what the likely scenarios are, not specifically about a Lehman Brothers or an AIG kind of scenario, but more generally about what the problem is that we're trying to solve?

Personally, because of my view on the low equilibrium real interest rate or natural rate of interest, I am mostly scared, if you will, about effective lower bounds, and I heard the word "visit." I feel this was like my son moving back home. The effective-lower-bound episodes are not visits, they're kind of stay-for-many-years situations. [Laughter] So, to me, in thinking about the policy framework, a lot of the important issues come up, as you said, Madam Chair, concerning LSAPs, liquidity insurance, and, obviously, stigma, and I'm not discounting those, but I do think that the effective lower bound is the thing that worries me.

And I do want to bring up an issue that the Vice Chairman and others brought up, and that's the issue of the legal restrictions on our ability to conduct monetary policy. I'm thinking about the types of assets we can buy, whether we can pay negative interest rates, Federal Reserve bills—I was scribbling these down while people were speaking—the various tools that we will have in the future to basically achieve our dual-mandate goals. And I recognize that these are legal restrictions. Even interest on reserves is a legal restriction. But I do think that if we come to the conclusion that we need more powerful monetary policy tools or that we need to be able to use Federal Reserve bills or pay interest to a broader set of institutions, we should, when we come to that view, try our best to convince elected officials that those are the tools that we need. Now, I know we can't control that, but I do think that should be part of our discussion. I don't

think we should have discussions only about what can we do under the current law, but we should think seriously about, well, if we could have additional tools, what they would be.

The last comment is that—and I don't mean to take up so much time, I apologize for that—I do wonder about stigma. Stigma in this conversation today sounds a little bit like too-big-to-fail. We're all against it, but it's actually an equilibrium outcome, right? It's not about who's causing the stigma. It's us, right? We're the central bank, and the policies that we set and the decisions we make are what cause banks not to want to come to the discount window. So in thinking about stigma, I think we have to go back to what I understand the fundamental issues is: Do we think there is value in telling financial institutions that you should be getting your funding from the markets instead of coming to the central bank, or do we think that, no, in fact, we want the central bank to be your source of funding on a regular basis? And I know I'm being very loose in how I talk about that, but I do remember 2007. When we said, "The discount window is open, and come," and no one came, I think the issue was really about the fact that banks understood that you weren't supposed to come to the discount window unless you were in trouble. And so I think that when we say we want to reduce stigma, we might look maybe a little more inwardly and think harder about why it is that we developed that situation in the first place.

CHAIR YELLEN. Well, I think we had tried to change that through policy changes made before the crisis to reduce the stigma and make it an effective ceiling, but I agree with your point. We hadn't been successful before that, and that continued to prevail during the crisis.

MR. WILLIAMS. I agree with what you just said, but I remember in 2007, with then-Chairman Bernanke, it was almost like we had an announcement, along with balloons and free hot dogs and soda pop, saying, "Come to the discount window. We're open for business," right? And then everyone said, "Not so much." And the TAF, I think, was, in a way, successful in

creating a different structure that somehow removed the stigma. So I'm just bringing out the issue that stigma seems to be something about which you can't just say, "I want there to be no stigma." You have to think about where the stigma came from. Thank you, Madam Chair.

CHAIR YELLEN. President Lacker.

MR. LACKER. Thank you, Madam Chair. I'll start by also complimenting the staff for their considerable effort and having a wide range of researchers engaged in the project. I found that really useful. These memos provide a lot of useful material, particularly the money market field research. I think no matter what we do, the research that's being done on this is going to be of lasting value for the System.

A little side comment on "stigma" before we go on—I agree very much with President Williams's observations that it's an outcome. If you think about wholly private market transactions, they also are subject to exactly the same thing, that if it's revealed that Party *A* borrows at Rate *X*, that's going to convey some information about the situation of Party *A*. We had Citigroup paying exorbitant amounts to raise additional capital in 2008, and that reveals something to the markets about just how dire the situation was at Citi, and I think that's unavoidable. It's part of the market outcome. And the lesson that yields for me is that we are going to have to accommodate ourselves to some amount of stigma.

I approached this general subject of the long-range framework with a leaning toward, as I said before, a simple, straightforward floor system, in which the interest rate on reserves is our sole policy instrument. And we supply just enough reserves to satiate the banking system with a fair, high degree of profitability and eschew targeting the federal funds rate or intervening in the RP market. Now, I'm looking forward to the staff's future work on this, and, as the Vice Chairman implored us, I'm retaining an open mind. [Laughter] I'm open to persuasion. But

what I've learned so far tilts me toward that preference. Beyond my preference about this, I think that that simple regime is a useful benchmark, and I think the way to approach the analysis of this is to take that and then view any other framework as that plus some stuff. And I'll get back to this.

At a broad level, what I take away from this is that there are a wide range of considerations in money markets that affect market outcomes—the observed trading volumes and prices for various money market instruments. The memos do a good job of documenting the array of regulatory factors. I thought that was really useful, sort of a missing element in the overnight RRP discussions we had. I think we had a sense that they were broad and pervasive and complicated, and I think that's the picture that emerges.

In addition, I was struck by the extent to which relationship considerations seem to affect many money market transactions, and I'm not sure I suspected they'd be as pervasive as they are. Apparently, there are some money market funding deals that are bundled together with other financial transactions and occur between parties that establish a relationship and continue it for some time. So there must be some economies of scope across financial transactions or maybe some fixed costs associated with establishing a relationship. Well, in those cases, the observed transactions don't represent arm's-length Walrasian spot trades that are popular in our models, so it's not obvious to me what it means to target a rate in a market governed by sort of relationship trades like that or whether it's advisable.

I was also struck by the importance of counterparty credit risk. In some markets, sometimes credit risk premiums are negligible or relatively stable outside of crisis periods, but some premiums arguably have been quite relevant to the federal funds market because there's always been a noticeable dispersion of observed transaction rates. To me, this makes it tricky to

think about targeting something like the average interest rate on federal funds when so many of the transactions build in some tiering or differential, what you'd interpret as credit risk premiums. When counterparty credit risk premiums rise across a broad range of counterparties in that market, which arguably happened in August 2007, then you'd expect the credit risk premiums to rise, right? And if risk-free rates don't change, then the funds rate will rise. If we target the funds rate, if we feel as if we have to hold that constant, then we in essence have to lower what's essentially the risk-free rate. Now, we often do find it appropriate to cut our policy rate at times when credit risk premiums go up, but it's not obvious that should be automatically one-for-one, and that's sort of what we imposed on the Desk in August 2007. We were sort of cracking the whip, asking them to keep the average funds rate constant.

VICE CHAIRMAN DUDLEY. I remember that. [Laughter]

MR. LACKER. Yes, you do. You were sitting right over there, getting some heat from the Committee about that in September. And yet the situation was that we had these risk premiums rising, and so you had to drive down what was, in essence, the risk-free rate. So if we worked with an administered rate, then risk premiums do what they do and we make an explicit decision about how much to offset that with a move in the risk-free rate. So, for me, as I said, just the welter of factors that affect various spreads and money markets make the simplicity of adopting an administered rate pretty attractive. They also make me dubious about targeting any particular market rate or aiming our operations at any particular money market beyond this administered rate we have.

We have some experience now away from the lower bound. It seems pretty clear that arbitrage among various parties does make the interest rate on excess reserves an effective anchor for other market rates. I think the interviews with money market participants confirm

that. If we just relied on our administered rate, we'd avoid the dependence on the funds market, which could dwindle to nothing pretty rapidly. We could avoid the cost of overnight RRP operations and sort of footprint concerns we've had. The information in the staff memos suggests those are superfluous to the degree to which IOER is acting as an effective market anchor already. In addition, with a floor system and a large enough balance sheet to satiate reserves, overnight and intraday lending by us would be fairly minimal. Daylight credit use would be fairly minimal, another advantage I think we need to count.

Now, as I said, I prefer that regime, but I'll just say that I think if the staff brings back a recommendation for anything else, I think the burden of proof should be on demonstrating that going beyond that simple regime has some benefits. Another way to put that as a question for the staff would be: What would be wrong with that regime? If we had money market rates configured the way they are, with us just running a simple IOER-based administered rate system, what would be wrong with the funds rate trading we'd see? What would be wrong with the RP rate? What would be wrong with money market rates that we'd need to correct by going in and targeting some other rate? And I guess that's the way to think about it.

There's one wrinkle that detracts from a simple IOER-based administered rate regime that springs to mind. The Congress gave the power to set the interest rate on excess reserves to the Board of Governors and not to the FOMC—in hindsight, arguably, a blunder. [Laughter] It might not be the first by the Congress, but—so I'm okay for now with setting the target rate at the funds rate as an interim arrangement until we can get the Congress to fix the legislation. But in response to President Williams's point: I think we shouldn't be shy about deciding we're going to seek some changes. In the meantime, this is sort of a messy aspect of the current framework because we really don't care about the funds market per se, which is the point our

Vice Chairman made. But having an announced target for the funds rate kind of makes it seem like we do, and it's an awkward aspect to the current regime, as I see it. So in their analysis of alternative frameworks, I'd urge the staff to be candid about governance questions as they bring back their work to us.

Let me talk about "liquidity programs," as they're called. One memo asks whether the framework should be designed to mitigate the tension between interest rate control and liquidity provision objectives. As I highlighted in response to President Bullard, in a simple floor system relying on just the interest rate on reserves, there is no tension between our monetary policy framework and liquidity programs. In fact, one of our former Federal Reserve Bank of Philadelphia colleagues used to oppose floor systems for exactly this reason, because they facilitated credit-market interventions. In case you were wondering, I can assure you that the ease of undertaking credit-market interventions is not the reason I prefer a simple floor system. [Laughter]

This obviously isn't the time to debate the merits of the various ways we intervened in credit markets during the crisis, but if the staff believes that there is a tension or a tradeoff between the ability to undertake liquidity programs and a monetary policy framework that they'd recommend, they're going to have to come to us with some sense of the economic benefits and costs of such credit programs, and they haven't done this in the materials they provide. In fact, the memo on lessons from the crisis simply takes as an unquestioned premise that various credit market interventions were necessary. They're referred to as things we had to do in this situation. This is consistent with some popular narratives that emphasize the inherent dysfunctionality in financial markets, but, as David Altig noted at the beginning of his remarks, scholars differ on the interpretation of the events of the crisis. I'm not aware of any economic analysis comparing

this popular narrative with alternatives, including ones that emphasize the extent to which volatility and distress in financial markets in that period were induced by the moral hazard effects of the perceived Federal Reserve stance toward credit provisions, particularly following the August 2007 actions that President Williams so vividly described. We haven't conducted such an evaluation internally, and I'm not aware of any credible external assessment. And without such a comparative assessment, I think the necessity of the sequence of credit market interventions we undertook in the crisis is far from obvious. So if the staff believes that the merits of liquidity program capability should be taken into account in monetary framework design, it would seem essential that they take the time to conduct an after-action assessment of our policy choices before, during, and after the crisis, even if that means putting the next phase of the work on the long-run framework on hold. In my view, this type of assessment is long overdue. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Mester.

MS. MESTER. Thank you, Madam Chair. Let me start by also adding my sincere thanks to the Federal Reserve System staff for their leadership, insights, and sheer hard work on the implementation framework project. I view the design of the project as focusing on the longer-run framework first, and then, presumably, we'll consider the appropriate transition path to that framework. Also, as Governor Fischer suggested, we'll need to really think about how we address times that are not normal, or crisis periods.

We're going to have this further Committee discussion focusing on framework specifics in November, so I thought today I would just provide four questions I think the Committee participants will need to consider in evaluating specifics.

First, how much volatility are we comfortable in tolerating for the policy instrument we're targeting in normal times and then in times of stress? Presumably, this is going to be one of the considerations in our preference for choosing an administered rate versus a market rate. And if the choice is a market rate, which market rate? President Lacker, I take your discussion as very interesting about the administered rate avoiding some of the problems. But, presumably, it's the correlation between that rate and other market rates that is going to matter for what we're doing. I think we still have to understand how the money markets are going to be affected by our choices.

I think our control of some interest rates may be different from the way it was in the past because of the structural and regulatory changes that occurred since the crisis, and I think the memos lay out some of those changes quite well. The bottom line is, I think we have to be focused on: How much does our control of certain interest rates imply for macro and financial stability? I think that's something that we need to think about. In crisis times, we may be willing to allow for more volatility, but what about periods when we don't necessarily realize we're at the beginning of a crisis? I guess I view the case of 2007 and early 2008 as one in which it wasn't necessarily clear at the time that the situation would develop into the crisis proportions that we saw *ex post*. A lot of this is in hindsight. But when you're actually in the moment, I think those tradeoffs between control and liquidity provision loomed large, but we didn't necessarily know how things would turn out.

Second, how should the governance issues and political economy issues be resolved? And a couple of the commenters have mentioned these. The interest rate on excess reserves is set by the Board of Governors. Monetary policy decisions lie with the FOMC. So far, in the post-crisis world, we've resolved this tension by still using the federal funds rate as our way of

communicating about monetary policy. If we communicate with a market rate, presumably this helps resolve the issue. The ON RRP rate also resolves the issue, because it's an FOMC decision. I think these kinds of issues also affect the size of the balance sheet we want to operate with. It does have implications for our relationship with the fiscal authority and perhaps a relationship of rates, like the ON RRP versus the IOER has “appearance” complications if we are going to be paying banks. I think we have to take those kinds of political economy and governance issues head on, and they should factor into our decisions about the long-run framework.

Third, what's our preference about the tradeoff between a framework that is complex enough to handle many possible contingencies versus one that's similar and presumably less costly that works well in normal times but would need to be augmented in unusual times? This is related to but somewhat different, I think, from the staff memo's definition of robust and flexible frameworks. The staff defines a robust framework as one that can provide sufficient liquidity outside of the U.S. banking system at times of market stress, and a flexible framework is one that can be adapted to handle evolving market conditions. I have to say, my own preference is for a simpler framework that can be augmented with supplemental tools in times of crisis. But this simpler framework would need to have aspects of both robustness and flexibility. In other words, the simpler framework is not likely to be the same one we used before the crisis. In particular, because of the possibility that the equilibrium interest rate will remain lower than it was before the crisis and the probability of returning to the effective lower bound on the policy rate, which has probably increased, we should have a standard approach to providing more accommodation once the effective lower bound has been reached. And I do think we're going to have to deal with the changes that occurred in money markets, although I understand that our

choice of framework then could feed back on some of those changes. So I think we need to really understand some of those issues, and the memo has pointed out quite well the kinds of issues we need to be thinking about.

I think that the Desk has undertaken a useful step in expanding counterparties, but expanding the types of institutions to which we routinely provide liquidity directly could have its own effect on the evolution of financial market structure, as pointed out by Vice Chairman Dudley. It could raise moral hazard problems, and we need to understand those better. And, of course, we're going to also have to think about operational readiness. Presumably, even if we decide that our standard framework isn't going to include a lot of these liquidity facilities or credit facilities or what have you, we're going to have to maintain expertise in that. So I would welcome further discussion on the tradeoff between simpler versus complex frameworks.

Finally, fourth, which framework design can best maintain the Federal Reserve's long-standing desire to avoid allocating credit to particular market segments and displacing private-sector financial markets? Maybe I'm channeling my former colleague from the Federal Reserve Bank of Philadelphia, that an operating framework that puts no limit on the size of the balance sheet might make the Federal Reserve more vulnerable to political pressures that at times would be exerted to get the Federal Reserve to use the balance sheet to support certain markets. And it also might lead to more structural changes in the financial markets that we are going to have to think about deeply as part of the discussion.

There are lot of interrelated considerations. I look forward to our discussion in November, and let me, once again, thank the staffs of the Reserve Banks and the Board of Governors for their efforts. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. I, too, would like to thank the staff for the thought-provoking memos on a long-run framework. I would say the comments that have already been made around the table were more wide ranging than I was expecting, and that's a very positive attribute.

I want to consider several assumptions that I believe are important in considering the long-run framework. The first is whether periods when the federal funds rate reaches its lower bound because of significant slack in the economy will be anomalous or a more common feature of a low inflation environment. My view is that, as long as we have a low inflation target and a low equilibrium real interest rate, a funds rate at or near its bound will become a regular feature of business cycles. This conclusion echoes comments by President Williams. It's been seven years since the end of the recession, and we have raised rates only once. Moreover, we have yet to shrink our balance sheet. Because few recoveries last a decade, it is quite likely that when the next recession occurs, we will still have a large balance sheet and limited room to reduce the federal funds rate before reaching its lower bound. One way to reduce the frequency with which we hit the effective lower bound would be to raise the inflation target. At the time that we set a 2 percent target, few of us would have predicted how many advanced economies would be facing long spells of negative rates, large balance sheets, and inflation rates below target. We should have a thorough discussion of the long-run implications of central banks around the world setting inflation targets that may result in the policy rate too often pinned at its lower bound. I hope we have such an open discussion at the end of the year and that we revisit the inflation goal on a regular basis—perhaps every five years, as the Bank of Canada does. If it seems likely we choose to maintain a 2 percent inflation target, then we should choose a long-run framework that

anticipates the federal funds rate regularly hitting its bound during recessions and allows us to respond flexibly in a manner that best achieves our dual-mandate goals.

If the funds rate regularly hits zero during future recessions, my second concern is whether we will augment conventional policy with quantitative easing or with negative interest rates. I would prefer expanding the balance sheet and possibly the composition of the balance sheet before resorting to negative interest rates. The early assessment of the costs and efficacy of negative interest rates is quite mixed. Most central banks that have gone negative have taken actions to help insulate banks from some of the collateral effects from that policy. In light of the concern about bailouts of banks in the United States, it's unlikely that policies that insulate banks will be politically feasible in the United States. I think it would be useful to have a fuller discussion of negative interest rates and whether it's likely to be employed as a policy response to future recessions.

Given our reluctance to raise the inflation target, expanded balance sheets are likely to be a regular feature of recessions. Thus, any policy we adopt should flexibly incorporate the need to expand the balance sheet and to change both the duration and composition of holdings. I agree with President Williams that we should consider asking for a broader set of assets that can be held, along lines similar to the practice of other central banks.

If an expanded balance sheet is a regular feature of future policy, we may want to expand our thinking on how we use our balance sheet. For example, if we decide that supervisory policies are unlikely to be effective for addressing bubbles in real estate, we may want to more actively consider whether to use our balance sheet to address such situations. In the face of rising real estate leverage and prices, we might choose to raise rates in this sector by shortening the duration of our holdings and selling some of our MBS. Of course, for this financial stability

tool to be possible, we would need to hold long-duration assets and MBS. Thus, I would not assume that in the future we will have a small balance sheet that is limited to short-duration Treasury securities.

Many of us now assume that the equilibrium federal funds rate will be around 3 percent. Historically, we have reduced interest rates more than 3 percentage points in response to most recessions. Of course, in those instances, we did not hit the effective lower bound because inflation and the real equilibrium rate were higher. But, for the future, we should assume that we will likely hit the effective lower bound, that we will resort to some balance sheet expansion, and, thus, we will need to control short-term interest rates for the foreseeable future and during most recessions. I, somewhat surprisingly, agree with President Lacker on one issue. I would prefer to focus on the IOER, an administered rate, but I also agree that that rate should be an FOMC decision.

Finally, the staff should continue to explore how to be flexible in a situation of a changing structure of our financial system. In particular, the platforms of both political parties are calling for readopting Glass-Steagall restrictions. If that were to occur, we would once again have large standalone broker-dealers that would likely be viewed as SIFIs regulated by the Federal Reserve. Having large standalone broker-dealers implies a greater likelihood of runs on them and calls into question whether the financing system can remain as dependent on repurchase agreements.

Second, we are requiring financial institutions to be more liquid, and justifiably so. However, there are limited quantities of high-quality liquid assets. Better understanding how our supervisory actions, in trying to increase liquidity in financial institutions, affect demand for short-term money market instruments would be useful.

Third, broker-dealers tend to be highly sensitive to economic conditions. Many of the European banks with large broker-dealers operate in the United States and remain troubled to this day. The continued dependence on broker-dealers as counterparties raises the issue of whether the discount window should be available to them to address liquidity issues or whether a more substantive change in their funding model is in order.

Fourth, the money market fund industry continues to evolve. This has implications for financial institutions' ready access to market for short-term liabilities. With the incentives to shift to government-only funds, the demand for high-quality liquid assets will increase further.

The issues raised by the staff were very useful. However, I would like to see us and the staff spend more time discussing some of these key issues.

CHAIR YELLEN. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Madam Chair. Thank you to the team around the System that worked on this project. Let me just make a couple of comments that struck me after reading through the papers, understanding these are early days.

Regulatory reform, I think, has certainly reduced the probability of financial crises and limited their potential severity. However, it also probably has reduced incentives for arbitrage in money markets and may introduce some frictions that make money markets work less smoothly, therefore possibly increasing the need for liquidity actions by the Federal Reserve. A combination of on-the-shelf liquidity facilities and the ON RRP may be needed to ensure future money market functionality and interest rate control in a potential future crisis. So far, the ON RRP facility has helped limit shortfalls and volatility in money markets, and the risk that it might have exacerbated flights to quality really has not materialized. For example, we didn't see it in January and February of this year, and we haven't seen it following the Brexit vote.

Nevertheless, because crises can hit at unexpected times and in unexpected ways—and, by definition, are surprises that you don't expect—I do feel strongly that we should do more work on having on-the-shelf liquidity facilities that could help limit the severity of market stress episodes and help address one potential downside of an ON RRP facility. In my view, in that crisis it may well be necessary to assist, in particular, the money market industry, dealers, and nonbank financials.

On slide 13 of the briefing materials, the points 2 and 3 that you made are, to me, a couple of the reasons why I would like to have on-the-shelf facilities. Number one, I think if there's clarity about the purpose of such operations, it does reduce stigma. And, in particular, it's important to emphasize that this is about the provision of liquidity versus emergency lending to individual firms. I believe that if our communications are well prepared and explain what those facilities are designed for, we won't eliminate stigma but should help reduce it. Also, your point about clarity on when liquidity insurance operations would be used—to limit contagion during stress events—is a very key one and is another reason to have on-the-shelf facilities.

I would add two other reasons for having on-the-shelf facilities. One, it allows you to move quickly, and, two, when you are in a crisis is not the time to be thinking through and making up provisions and mechanisms to deal with the situation. That is, I'd rather we did this in advance in the cold light of day rather than on the run. And I think we have the opportunity to do that, so I would encourage you to do more work on this. I understand the risk that it may appear to create or induce an overreliance on the Fed, and there are some political sensitivities associated with that. But this work is very, very important, and I think history has shown that we ought to have these facilities in place with our communication well established in advance. So I encourage you to do more work on this. Thank you.

CHAIR YELLEN. Thank you very much. President Evans.

MR. EVANS. Thank you, Madam Chair. I'd like to thank all of the contributors to the long-run framework working groups who presented here today. The first installment has been an impressive effort, and I learned a lot from reading the memos and discussing them with my staff. The presentations clearly point to a number of tradeoffs that will be associated with choosing among alternative implementation structures.

Before I forget, I agree with the comments that President Williams and President Rosengren made, that the implications of the probability of hitting the effective lower bound should be considered within the context of our long-run framework discussions. I think it is certainly the case that the choice of our inflation objective is part of that, in terms of how low interest rates will be during normal times and how much capacity we have to lower rates when we need to do so.

I'd like to say at this point that I remain open minded, no matter what I say after this. [Laughter] I am not strongly wed to many prior views on the long-run framework, and it's simply useful for each of us to push, in our own way, harder on all of the framework presentations. So, in that spirit, I will continue.

I'm not sure this isn't just nostalgia for the old days, but I do confess some sympathies for returning to our pre-crisis framework with a small balance sheet, or at least a smaller balance sheet than we have. At least during normal times, it served us well and in ways that we probably still don't fully appreciate, at least I think when it comes to minimizing political risks that we previously never considered.

A fundamental question for me is this: Do the changes in financial markets that we have experienced over the past several years make it clearly undesirable to return to the "old world"?

I'll describe it that way. I appreciate that there are numerous details that complicate this return to a more conservative, old-style monetary approach. For example, we will have to determine if changes in regulation and business practices have had a lasting and unalterable effect on reserve demand and overnight funding markets in general. And, in turn, there are many interactions and interdependencies involved in analyzing this and other important questions. I'm looking forward to hearing more about the strengths and weaknesses across alternative frameworks, both during normal times and during periods of stress. Our ability to achieve our set of macroeconomic outcomes is the most important piece of this decision tree, it seems to me. Maybe it's the easiest. The social benefits of reducing deadweight losses in some markets might be more uncertain and controversial with respect to possible unexpected outcomes that I just can't lay out today, because I don't know that we know them.

Again, here is that caveat. I remain open minded, but I am wondering about the following risk. It's not just the economics that are difficult. The decisions that we make about the implementation framework will be scrutinized from a political economy perspective as well, and I think President Mester touched on a number of these issues. Inevitably, we will need to consider the possibility that not all of our tools will be available in the future.

Madam Chair, you mentioned that there are already "optics" concerns related to the IOER rate being above a market rate. The Congress has wondered whether that is something of a subsidy to certain financial institutions. For example, large IOER payments to banks may not always be seen as "living the Friedman rule" and reducing regulatory reserve burdens. I worry about the possibility that, when rates increase and get closer to neutral, when we finally do normalize, if we still have a large balance sheet, the size of IOER payments going out to banks may become a political lightning rod. Should we select a best framework or most robust

framework, subject to achieving a number of objectives that we specify? I look forward to hearing more about this. Our previous small-balance-sheet approach may seem 20th century, “old school,” and opaque. But I wonder if those tools and authorities might be more robust to changes in political winds. I’m just wondering.

I appreciate the long-run framework project’s commitment to a broad, open, and robust process that considers the issues from many vantage points. It will help us understand important tradeoffs and move us toward adopting an implementation framework that will serve the institution well in years to come. I expect to learn more, and I remain open minded about selecting the best appropriate framework for the years ahead. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Lockhart.

MR. LOCKHART. Thank you, Madam Chair. I, too, would like to add my thanks to the workgroups’ very thorough work products for today’s discussion.

While I think the framework in place today seems to be working well for monetary control purposes, I do support this effort devoting time and resources to thinking ahead, exploring options, and, importantly, anticipating various states of the world in which the Committee might be making policy. I do think we have time to do this exercise in a very deliberate way. I don’t have a lean yet. I’m processing the information in the memos at a somewhat more basic point of consideration. I found the three memos helpful in teasing out what seemed to me to be the first-order pertinent questions. Some of my questions may suggest further work and attention, so here’s what’s on my mind, informed by the memos.

Realistically, can we get back to a corridor system and preserve the federal funds rate as a centerpiece of policy setting? Will reserves be scarce or plentiful down the road? If we take as a

given the fact that depository institutions will want to hold a higher level of reserves, will their target level reserves vary with changing conditions? And, if so, how?

Will the expanded number of counterparties that we now have be a permanent aspect of the operating framework? And if we were to go further, what classes of institutions would we want to include? What are the benefits and negatives of expanding the range of collateral instruments?

If we want to preserve a market rate as the policy rate, how viable is the federal funds rate as a policy instrument? Are the overnight interbank funding rate, which is an unsecured instrument, and/or the GC repo rate, a secured instrument, workable alternatives as a market rate? And do these rates require expanding the number of counterparties? More generally, what distinguishes one money market rate from another as a potential policy rate?

Regarding arbitrage behavior, what can be assumed to be reliable on an ongoing basis? I'd like to understand better what incentives and disincentives are associated with regulation as they affect arbitrage opportunities.

And, finally, a broader question is suggested by commentary that comes on pages 9 and 10 of the memo "Lessons from the Crisis": What conclusions can we draw regarding the features of the U.S. environment that will shape implementation practices? I think we might gain from an attempt to work back from the environment or the context of policy to the operating framework options and choices. We tend to think of environment features in terms of the structure of money markets and the regulatory picture. As others have raised, including President Evans just before me, I'll suggest that we might also think about the political support for operating in different ways. As I see it, there is likely to be political pressure on the IOER rate as an instrument. I'd like also to suggest that, as we move this exercise forward, thought be given at some point to the

requirements of transition from the current regime to another and to the communications challenges involved.

Finally, while these were prepared in advance, I will freelance for just one moment, perhaps responding to Governor Fischer and something that President Williams said, about our regime that will probably work in normal times, with many different versions of it. But I think the times also call for perhaps thinking well outside the box. So to borrow from a different discipline—maybe a little bit of a “Herman Kahn” approach to thinking about the unthinkable—we’re in an era in which it’s not unthinkable that a terrorist act or cyberwarfare could severely affect the operating environment of the Federal Reserve. So I would encourage some work on thinking about scenarios that are really extreme and how we would respond to those scenarios. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Tarullo.

MR. TARULLO. Thank you, Madam Chair. I’m going to begin with a procedural point, which picks up on some of the things John said earlier. I think we have to find a way to explore a variety of ideas here, some of which may be pretty innovative and some of which may be pretty far reaching, without committing anybody *ex ante* to any particular direction. I think it is hard to do that in this room because discussions here have a tendency to either acquire a certain direction or acquire a certain oppositional quality whereby it seems as though something is being debated. And, like President Williams, I see neither the need nor the desirability of rushing to some sort of answer. I think that we’re going to need to figure out a way to have an exploration of both a lot of the substantive issues people have raised as well as a blue-skying of ideas that takes place outside this room but in a way that is accessible to people in the room who are currently in the room and who may be able to participate. This can happen through the Jackson

Hole symposium and other conferences. It might be able to happen informally. But I do think that's important, because we don't want to force the staff to either come back only with incremental ideas because they feel it's not their place to change things fundamentally or to force them to come back with something that's quite far-reaching, and then for us to say, "Who are you guys to be coming to us with something far reaching like this?" So some sort of iterative process in between, I think, is actually important.

Let me now just identify, as a number of other people have, some of the issues that I think are particularly useful, interesting, or important, or all three, to pursue during this process. At the very top of that list I will echo Presidents Evans, Rosengren, and Williams in saying that how to think about accommodation in a low-for-long environment is, I think, essential to this exercise, and if it doesn't address that question, it probably hasn't succeeded. Other things I'm going to mention now I think are important, but without that first element, it's a little hard to see why we would have gone through the whole thing to being with.

Next, I would say, how to adjust monetary policy to the better regulation of financial institutions and activities that have been put in place since the crisis is actually very important. And in this respect, I would recommend—I know the staff knows about it, because they've read it—to the Committee generally a paper on monetary policy and regulation put out, I think, Vice Chairman Dudley, was it a year ago May, by the Committee on the Global Financial System?

VICE CHAIRMAN DUDLEY. Yes.

MR. TARULLO. I think it was put out in May 2015. Is that when it was?

MR. POTTER. Yes, last year—"Regulatory Change and Monetary Policy," paper number 54.

MR. TARULLO. Yes. It was, I thought, a very nuanced assessment of how the necessary changes in regulation will need to be accommodated by monetary policies throughout the world, and it was done principally by people from the monetary policy side of shops. It wasn't done by regulators, which I think is one of the things that made it useful. Now, we were lucky that our participant was someone from the Division of Monetary Affairs, but someone who knew a lot about regulation, and I think other central banks were able to do the same, which is why it has a nuanced feel to it. In that regard, I would note that the maximum lubrication of the policy transmission system that monetary policy people sometimes talk about as desirable is actually, if not quite the same thing, very close to the same thing as the massive amounts of short-term wholesale funding that support unexamined credit positions and runs at the first real signs of trouble.

That's why the regulation and monetary policy decisions need to be thought of at the same time. You can't just think, "Well, we want maximum transmission so that we can get monetary policy through in these very liquid markets" without realizing that it's those very liquid markets that freeze up when things start to go awry, which leads me to the concept of "liquidity insurance." I know that is not a term coined by the staff, but it is a pregnant term, which immediately elicited in me the question, "And who exactly is paying the premiums for that liquidity insurance?" And the answer, of course, is not really anybody in some of the countries that the staff was referring to, except insofar as you accept the proposition that being part of a regulatory system is in and of itself a premium, a case pretty hard to make on the basis of the existing state of the financial system. I would note in this regard that the United Kingdom and Switzerland, the two countries correctly cited as having some of the more fulsome liquidity facilities, are also two of the jurisdictions that have what we might term "unusually large"

financial systems, given their GDPs. And I think it's difficult to avoid the conclusion that it is necessary for the central bank to be a very generous lender of last resort in order to sustain what some might characterize as outsized financial systems. This leads to some of the questions that Vice Chairman Dudley was suggesting a moment ago as well about our own financial system, which, although it's not as outsized relative to our GDP as is the case in either the United Kingdom or certainly the old Switzerland, is still pretty outsized in comparison with the rest of the world. And that does get us thinking, as Vice Chairman Dudley said, about the layers of intermediation that take place, but also the kind of things that we want to be backing up, as it were.

Now, I actually was a bit bemused by President Lacker's suggestion that it was moral hazard that created the problems during the crisis. I would very much agree with the proposition that moral hazard in the years preceding the crisis led to the conditions that created all of these runs. Personally, I subscribe to the view that when you're in the middle of a crisis is not the time to create bulwarks against moral hazard. That's what you do when things have calmed down. But that is something that we need to be thinking about. And it's the reason why I have been more skeptical than a lot of you—although, judging by today, I have more allies than I might have feared, and I'm glad to hear that—about always wanting more powers in the central banks to be able to create liquidity, because there is a time-consistency problem that is created when you have those powers, and that's why it's a difficult set of issues.

That pushes me to the existence, size, and use of the balance sheet, which I think is in the first instance an analytic question. That is, there's a positive analysis to be done before the normative analysis comes through. I was in Cambridge, Massachusetts, a week ago Friday and had this very interesting experience in which I had breakfast at Harvard University and lunch at

MIT. And so at Harvard University, led by Jeremy Stein, as many of you would have guessed, I very much got the demand for safe assets: “You know, they’re being privately created right now, so the Federal Reserve should think about creating public safe assets” and all the rest—the full dose of that. And then a mere two stops down the Red Line, in Kendall Square, I got the exact opposite view, which is, “It is a very dangerous thing for the central bank to be creating safe assets. Moreover, a lot of the so-called demand for safe assets will actually dissipate.” If they could meet in Central Square and have the debate, that would be fun to watch. But, analytically, I do think we need to pay attention to that issue because whatever our normative predispositions, if there is, indeed, a substantial exogenous demand for money like our safe assets that is going to be privately created, we have to take that into account not just for regulatory purposes, but also when thinking about the transmission of monetary policy. And if we come to that analytic conclusion, we may or may not decide that we want to do something with the balance sheet, as Jeremy Stein would have us do to create safe assets, but we at least need to take that into account. And then as President Rosengren said—so I won’t repeat it at any length—it’s conceivable that you’d also use the balance sheet for monetary policy purposes, with a sort of twist–reverse twist kind of mechanism. I think that’s worth exploring as well.

And finally, an issue that I don’t think anyone has mentioned to this point is that I do think it’s worth paying some attention to the unique role of the dollar in the global economy and thinking about how we fashion our monetary policy framework. It occurred to me in the first instance as I was reading the memo on foreign central bank frameworks. And I said, “Wait a second. This is very interesting, but, man, oh, man, this would not work for us, because you’ve got people holding dollar assets as currency reserves all around the world.” So I do think it would be worth specifically addressing the question of the degree to which the role of the dollar

as the principal global reserve currency both affects us in the effectiveness of monetary policy decisions that we would make—this is back to global savings kinds of issues—and, in turn, affects other people, which has a kind of feedback effect on the performance of the macroeconomy. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kashkari.

MR. KASHKARI. Thank you, Madam Chair. I'll just make four quick points. First, let me add my voice to all those who came before in encouraging the staff to do work looking at the effective lower bound. I think that's paramount, as others have said. I know you were planning to do it anyway, but I think it's important.

Second, I'm interested in the staff's view on some of these on-the-shelf or off-the-shelf tools. How often would you expect that we would use them? To me this goes right to the core of both stigma and moral hazard. I view stigma and moral hazard as closely linked. If we have tools that are used frequently, they're going to have low stigma and potentially increase moral hazard. Tools that are used infrequently, the opposite. Would you envision us using these tools in the ordinary course of events every year, every 10 years, every 100 years? I'm just interested in getting your perspective on that.

And this is linked to something that Vice Chairman Dudley said, which was, "Would the crisis have been less severe if we had more of these tools ready to go?" I'm not sure. When I think back to my experience during the crisis, when people asked me to reflect on our performance, let's say, the government entirely—the Federal Reserve, the Treasury, et cetera—the criticism that I offer is that we were always late because, in connection with Loretta's point, we didn't know how bad the crisis was, and we were reluctant interveners. I'll give you one example. Just take the TARP, as the most extreme example. When the Congress passed the

TARP, it was about two weeks to when we announced the capital injections, and about a month later we actually had money going into banks. But it had been sitting on the shelf as a concept for eight months until Bernanke and Paulson said, “Now we finally have to go to the Congress.” So the delay was not the implementation. The biggest delay was us having the will to say “We need to do this.” So it affects, for me, how I think about tools on the shelf. Is it the time to implement the tool or the time to make the decision to use the tool that ultimately is the delay?

And then the last point I’ll make, because I think we should be humble about our ability to forecast the future, is that if we had gone back 20 or 30 years ago and asked the Federal Reserve System to design tools that would have been useful in 2008, there’s no chance they would have come up with the right set of tools that ended up being implemented in 2008 because the markets evolved. That tells me that we should err toward simplicity but flexibility to give future participants the tools they need to design tools in the moment, because we’re probably not going to be able to design them right now. Thank you.

CHAIR YELLEN. Thank you. Governor Powell.

MR. POWELL. Thank you, Madam Chair. I want to join others in complimenting the staff on this very interesting set of memos. These are tremendously interesting and important questions. Of course, for those of us who were here, it takes us back to a set of discussions we had in 2013 and 2014, which led up to the adoption of those principles in September 2014, which I’ll come back to in a second. I think we’re in a different situation now. The questions we’re asking now really don’t need to be answered. It’s a great discussion to have, but I don’t see the wisdom in driving this to conclusions at this point. I think we have a lot to learn over years to come and reasons to gain from that experience.

The Policy Normalization Principles and Plans were published by the Committee in September 2014, and it's a reasonably detailed, if not fully worked out, formulation, nor could it have been fully worked out. I'd say that that framework works pretty well, and, on the basis of the one rate increase we've executed so far, we have decent rate control. But I do think it's likely to prove vulnerable over time and not just in times of crisis. The September 2014 principles were wise enough to conclude with the observation that "the Committee is prepared to adjust the details of its approach to policy normalization in light of economic and financial developments," and that is one principle that I suggest it would be wise to honor.

The note on foreign experience does show that other central banks have used a range of different frameworks to control policy rates: floor and corridor systems, targeting secured and unsecured rates using administered rates, as well as market rates. So I think we do have plenty of flexibility in choosing our own long-run framework—and should feel free to pick one that is tailored to our own institutional setting and that will work in different conditions, particularly at the effective lower bound, both for administering monetary policy and for providing liquidity.

The arbitrage trade that currently sets the federal funds rate, as we all know, is between the Federal Home Loan Banks and the foreign banks, essentially, and that trade could easily go away—for example, if the Federal Home Loan Banks exit the market like Fannie and Freddie did or if regulation or some other factor makes the trade less profitable for FBOs. More broadly, unsecured borrowing between financial institutions is in secular decline. So if we were choosing a reference rate to last for a long time, which happens to be exactly what we're doing on the LIBOR project, the federal funds rate would probably fail the fundamental design criterion of sustainability.

The money market memo points out that there may be a secular increase in reserve demand due to heightened liquidity expectations for banks. If that is so, reserves could become scarcer than expected. I still suspect that scarcity is a very, very long way off. Also, higher demands for reserves may or may not translate into higher trading volumes in interbank markets. And let me add that I don't see higher trading volumes between banks in federal funds as something that we need to have.

For these reasons, I have growing doubts, actually, that the best long-run solution will be to return to a corridor system targeting the federal funds rate as set through scarcity trades between banks. We've really been in a floor system for eight years now. It's, to me, very likely that it will remain so for some years. That system has worked. Markets are now used to it, and it may well be that the better long-run approach will be to continue with a floor system, albeit with a much smaller balance sheet, which can be done if only because markets will have known nothing else for probably well over a decade. It may also be appropriate to target a secured rate, as secured borrowing does not appear to be in secular decline, and it involves a much wider set of participants. The overnight bank funding rate is an unsecured rate that represents a middle ground and captures a broader range of transactions and counterparties, and it's an improvement over the federal funds rate, but it's still subject to the secular decline in unsecured interbank borrowing. I will add that I'm also among the open minded when it comes to deciding whether to choose an administered rate versus a market rate.

Turning to liquidity for a second, the memos show clearly, in my view, that the pre-crisis toolkit did not contemplate, and was not designed to address, the run dynamics that arose during the crisis. Policymakers improvised, acted on the fly. And I believe history will judge those efforts as a success achieved under extremely trying conditions. There is an understandable

desire to avoid having to live through all of that improvisation again and, in that spirit, to keep some or all of the crisis liquidity programs close at hand and in working order.

For now, most of the crisis-era liquidity programs have been wound down. One could think of them as being unplugged and in dry storage, except for the swap lines with the five other central banks. The memos ask whether these programs should be active parts of the framework or instead on the shelf. I feel like I have a lot to learn on that and, again, am open minded. I guess, for the most part, I lean toward the idea of keeping them off the shelf rather than right at the edge of the game or part of the framework, which might require investing a lot of resources to keep them operational, but there could be exceptions to that. In particular, I could imagine a role for the TAF, which would be to provide liquidity to a range of banks in the ordinary course and over time perhaps reduce the stigma associated with the use of the discount window.

I believe we continue to do a good job over time of explaining and defending our traditional lender-of-last-resort role—not so much expanding it but sustaining it—and that role needs to work in the context of financial markets that continue to evolve ever further from the traditional bank-based model. A wider set of counterparties would provide a more resilient framework and money market system. As the financial crisis gradually recedes into memory, I hope that we'll find more receptive external audiences for that view. I do also recognize the tradeoff with moral hazard and look forward to hearing more on that.

To wrap up, while this exercise is a worthwhile one, there's no need to make decisions that will be better made several years down the road. And there will be a benefit in not making decisions until we see how markets evolve over time—in particular, adapting to the new regulatory regime. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Brainard.

MS. BRAINARD. Thank you, Madam Chair. I appreciate the very high-quality and voluminous material [laughter] that the staff is developing to help inform these policy deliberations, and I'm guessing that all of the comments that we're making today will lead to even more voluminous material.

I think it's always tempting as policymakers to hark back to an era of greater simplicity with fewer tools. But I think it would be a mistake if we succumbed prematurely to that temptation without carefully assessing the complex nature of the challenges we are facing today and are likely to face in the future in order to fulfill our statutory responsibilities. I think the financial markets in particular have evolved considerably and are likely to continue doing so. The staff's analysis highlights the role of regulation. And I think this needs to be further explored. But I also want to make sure that we're taking into account the role of technology, which is already affecting the wholesale financial markets and changing market structure and is likely to do more of that. We certainly saw that in the Treasury securities markets in October 2014, and we're likely to see more disintermediation and changes in market structure associated with technology.

I also would highlight, as others have done, that it's important to take into account the likelihood that we find ourselves in a lower neutral rate environment for a protracted period of time. This is an environment in which the same frequency and size of shocks that we have seen historically would lead us back down to the effective lower bound with greater frequency, which surely needs to be taken into account in our policy framework, and one in which we might see greater international transmission than we have previously.

The analysis, to me at least, suggests that the complicated nature of the challenges we're likely to face may, in fact, require greater complexity in our implementation framework to

achieve in the most effective and compelling way the clear objectives the Congress set out for us. In my own view, it's very important to think about provision of liquidity in the wholesale financial markets at times of stress as part of our critical responsibility for financial stability in parallel to our monetary policy objectives. And I do believe that I would like to see some explicit consideration of the demand for safe assets and what our role is likely to be or should be in the future. It seems particularly important for us as the central bank that has the deepest, most liquid, largest wholesale financial markets in the world and a currency that is viewed globally as the most important reserve currency. This is not something we chose, it may not be something we wished for, but it is something that I think matters in terms of our role in the system and the ways that financial stresses spill over into our markets. So I agree that it should be taken explicitly into account.

That said, I'm certainly keeping a very open mind, and others around the table, I hear, are doing the same. I think it's quite premature to draw any firm conclusions until we're better able to assess possible tradeoffs. I do believe that at some juncture we would benefit from a broader public discussion of these issues—not just with expert communities, but also with nonexpert communities who may not fully understand the kinds of tradeoffs that we faced during the crisis and may well face. And it's better to have those discussions *ex ante* than to try to defend actions *ex post*.

So, against the background of those considerations, I do think this is a very important set of analyses. And I hope we'll have a lot of time before we need to actually draw conclusions about tools and the framework. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Fischer.

MR. FISCHER. Thank you, Madam Chair. I'm not sure whether I missed something that Governor Tarullo said, but I heard him talking about the interaction between the need to plan the system to take account of both the regulatory system that you're changing and the financial system. And I think we ought to remind ourselves that we missed that in a big way in 2006, '07, and '08, when the supervisory system did not carry out the functions as well as it should have, and that those two elements of our job as the central bank, which are supervision and regulation of the financial system and the provision of a lender-of-last-resort facility, are very intimately connected. They are connected in the sense that any intelligent human being faced with the choice between creating a recession of the depth that we had in 2008 to prevent moral hazard on some future occasion—which it wouldn't do anyway, because the people who created that crisis won't be around for the next one—will, in the end, succumb to what we call “moral hazard”—and what I call “common sense”—namely, that you don't destroy an economy for the next five years in order to teach somebody a lesson.

So we will not get to that point, and that means we have to make sure that through all the tools that we have at our command, we minimize the probability of being put in such a situation. But we should never believe that we understand the world and the random events that happen well enough that our successors will not be put in that situation again. We're not going to end too-big-to-fail, and we need to take that into account. We just have to make absolutely sure that we have done everything that we can to minimize the probability that we are put in that situation at some future date. And I think that has to be part of the discussions. I think several people have already said they would like those issues discussed in the next round of this very, very critical discussion. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Anybody else? [No response] Okay. Well, let me end by again thanking the staff for their fantastic work. I think the input that you've heard will be useful as we prepare for further discussion in November.

Why don't we take a break at this point to have lunch and resume at, say, 1:15.

[Lunch recess]

CHAIR YELLEN. Okay, folks. Will this group come to order? We're ready to begin with the Desk briefing, and let me turn things over to Lorie Logan.

MS. LOGAN.² Thank you, Madam Chair. The U.K. referendum vote to leave the European Union dominated market attention over the intermeeting period. The top-left panel of your first exhibit shows the changes in domestic asset prices over various windows during the period, with red indicating declines in risk-asset prices and increases in safe-haven asset prices and blue indicating the reverse. As you can see from the first two columns, financial markets were highly volatile in the first few days following the U.K. referendum, though asset prices have largely retraced since. As shown in the third column, on net over the intermeeting period, short-dated Treasury yields and the U.S. dollar were little changed, while the S&P 500 increased about 5 percent and high-yield option-adjusted spreads narrowed roughly 60 basis points.

In explaining the shifts in domestic asset prices over the period, market participants suggested that the Brexit vote outcome increased downside risks to the outlook for global growth, especially for the United Kingdom and the euro area. This in turn fueled expectations of easier monetary policy across advanced economies and prompted investors to "reach for yield." Along with the better-than-expected U.S. economic data, this prompted a reversal of the immediate effects of Brexit on domestic asset prices.

The top-right panel focuses on the changes in expectations regarding monetary policy in advanced foreign economies.

As you'd expect, the shift in policy expectations was biggest for the United Kingdom, the red line in the top-right panel. While the Bank of England left its key policy rate unchanged last week, interest rate futures in the United Kingdom are currently pricing in a full 25 basis point cut at the upcoming meeting, with some also expecting an expansion of the Funding for Lending Scheme or additional asset purchases or both.

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

In the euro area, market-implied rates, the dark blue line, also shifted down, although market participants view the most likely form of additional easing this year to be a six- to nine-month extension of the ECB's asset purchase program beyond the current soft end date of March 2017.

In Japan, money market rates, the light blue line, are relatively little changed since Brexit. However, surveys show expectations for an expansion of the BOJ's asset purchase program, which may include a doubling of ETF purchases as well as a marginal increase in JGB purchases. In addition, expectations for Japanese fiscal stimulus increased over the period on the back of Prime Minister Abe's current ruling coalition winning a supermajority in the Japanese upper house.

In the United States, the path of the target federal funds rate implied by market prices was little changed, on net. In contrast, the most recent Desk surveys reveal a notable shift in expectations regarding FOMC policy. As shown in the middle-left panel, expectations for the most likely number of rate hikes over the remainder of 2016 moved lower. Roughly one-fourth of respondents now think that the most likely outcome is for no hikes this year, and no respondents view two hikes as most likely.

Survey expectations for the target rate beyond 2016 also moved lower, with a decline of about 20 basis points in the mean expectation for the target federal funds rate at year-end 2017 and 2018. The decline in expectations was most pronounced among dealer respondents and, as shown in the middle-right panel, resulted in a narrowing in the gap between survey- and market-implied rates. Commentary by survey respondents suggests these revisions to expectations of FOMC policy were driven primarily by the Brexit outcome. Alongside the shifts in rate expectations, the median expectation for the timing of a change to the Committee's reinvestment policy also pushed out notably, from the end of 2017 to the second quarter of 2018.

Expectations for more accommodative global monetary policy reportedly contributed to the declines in longer-term U.S. interest rates over the period. As shown in the bottom-left panel, the 5-year nominal Treasury rate 5 years forward reached a historic low in the aftermath of Brexit, and the 10-year yield traded below 1.35 percent. The declines were driven almost entirely by real rates, as measures of inflation compensation were little changed.

To better understand the moves in longer-term rates, a new Desk survey question asked respondents to rate the importance of various factors in explaining the declines in the 5-year nominal Treasury rate 5 years forward over two time horizons: first, over the intermeeting period, and, second, from the start of the year to the June FOMC.

As shown by the blue diamonds in the bottom-right panel, the highest-rated factors for the intermeeting period were spillover from low or declining yields abroad and safe-haven demand, although conversations with market participants suggest that the effect of safe-haven demand was limited to the immediate aftermath of the U.K. referendum. These spillovers, driven by the relative attractiveness of U.S. fixed-

income instruments amid a dearth of yield globally, appear to be a continuation of a trend seen since the beginning of the year. In fact, as shown by the red diamonds, spillover from global yields was also rated the most important factor contributing to the declines earlier this year, followed by changes in the outlook for U.S. economic growth.

For context on the low global yields, the top-left panel of your next exhibit shows the portion of sovereign debt in Japan and the euro area with negative yields. In these markets, most sovereign debt out to the 10- to 15-year maturity range is trading in negative territory and, as a result, roughly 40 percent of all G-4 sovereign bonds yield below zero. The low yields, driven by weak economic growth prospects, negative policy rates, and expectations for further central bank easing measures, have reportedly prompted many investors to rebalance their portfolios toward higher-yielding assets.

In addition to driving longer-term U.S. yields lower, this “reach for yield” has reportedly served to boost global risk asset prices. As shown in the top-right panel, the S&P 500 increased roughly 4 percent to an all-time high, while the MSCI Emerging Markets Index gained more than 8 percent over the period and month-over-month inflows into EM equity funds accelerated to year-to-date highs.

Despite the strong performance of global risk assets and the relative resilience of financial markets in the wake of the Brexit decision, market participants continue to highlight several medium-term risks. The first relates to Brexit itself. Brexit-related uncertainty is expected to persist for the foreseeable future, and as I noted at the outset, the outcome increased perceived downside risks to economic growth. Market participants are focused in particular on how political cohesion in the EU will evolve. Thus far, there have been few signs of contagion, although in the wake of Brexit, sentiment toward the European banking sector soured further. As shown in the middle-left panel, the Euro Stoxx Banks Index, the light blue line, has declined more than 10 percent since the referendum and more than 20 percent since the start of the year, as sluggish economic growth and low net interest margins are expected to weigh on profitability. As Steve will discuss, the Italian banking sector, the red line, has been a notable underperformer.

A second point of investor concern in Europe as well as globally is the persistently low levels of inflation compensation. Five-year, five-year-forward inflation swap rates in the United States and euro area have increased a bit from the lows reached post-Brexit. As shown in the middle-right panel, however, they remain near historically low levels, perhaps reflecting the effects of constraints on monetary policy at the zero bound.

A third risk relates to the possibility of renewed U.S. dollar appreciation. While the broad dollar index, the light blue line in the bottom-left panel, was little changed over the period, this masks a notable appreciation against developed market currencies, the red line. Market participants continue to view a substantial dollar appreciation and the capital flows that could result as a significant risk to markets.

The most salient concerns regarding dollar appreciation appear to be the risks it poses to Chinese FX and financial markets and, in particular, whether it could accelerate the need to delink the RMB from the dollar and lead to less perceived transparency as Chinese authorities attempt to manage that process. The RMB reached its weakest level against the dollar since 2010 over the intermeeting period, as shown by the dark blue line in the bottom-right panel. Additionally, the CFETS renminbi index has now depreciated more than 5 percent since the start of the year, as shown by the light blue line. Thus far, investors appear to be taking the gradual weakening of the RMB in stride but are quick to recall the volatility that the RMB's depreciation against the dollar last summer and earlier this year appeared to produce.

Your final two panels focus on money markets and Desk operations. As shown in the top-left panel of your third exhibit, money market rates, particularly repo rates, increased over the intermeeting period, as dealers sought to secure funding ahead of the Brexit vote and the June quarter-end. The rise in secured rates put upward pressure on unsecured rates, with the effective federal funds rate averaging 39 basis points, 2 basis points above the previous period's average.

Despite higher market rates relative to the overnight RRP rate, average daily overnight RRP participation increased, as shown in the top-right panel. As shown in red, Freddie Mac's participation rose from an average of about \$1 billion per day in earlier periods to \$12 billion per day, as part of its cash management strategy ahead of planned buyback and reissuance of longer-term debt. More notably, government funds' overnight RRP usage, shown as the dark blue area, also increased. This increase in usage came alongside a movement in assets under management from prime funds to government funds ahead of the October implementation date for SEC money market fund reforms. As shown in dark blue in the middle-left panel, approximately \$105 billion left prime funds this intermeeting period, while the AUM of funds that invest in government and agency securities, the light blue area, increased \$100 billion.

Market participants expect this trend to accelerate in August and September. Money funds we surveyed in June expected investor flows to generate a migration of about \$320 billion from prime to government funds, shown in light blue in the middle-right panel, though estimates ranged widely across respondents. The realized and expected investor flows come on top of the roughly \$350 billion in prime funds that have either converted or are in the process of converting to government funds, the dark blue column in the panel. Altogether, this would leave roughly \$850 billion in AUM in prime funds, the red portion of the bar to the right.

Despite the increase in government fund AUM over the intermeeting period, usage of the overnight RRP facility as a proportion of the overall assets under management for RRP counterparties increased only modestly, as shown in the bottom-left panel. This suggests that to date these funds have been able to successfully allocate most of the new cash to private-market investments.

In anticipation of further investor outflows, prime funds have shifted their investments toward shorter-term assets. As shown in the bottom-right panel, the decline in prime fund holdings of commercial paper and time deposits has accelerated, particularly as the three-month tenor recently crossed the reform implementation date. Increased reluctance by prime funds to hold three-month investments reportedly contributed to the widening over the intermeeting period in the spread between three-month LIBOR and OIS rates, the red line. While not shown here, the increase in LIBOR also contributed to the recent increase in U.S. interest rate swap rates, which settle to three-month LIBOR.

Market participants suggested that the effect of money fund reform also contributed to an increase in offshore dollar-funding costs, including the three-month U.S. dollar cross-currency swap bases shown in the top-left panel of your final exhibit. Recall that the basis measures the cost of borrowing U.S. dollars offshore through the FX market relative to the costs of borrowing dollars directly. Some contacts have noted that a reduction in prime funds' lending to foreign banks could have increased demand for funding through the FX swap market, and that this may have pushed FX bases wider.

The upward pressure on offshore dollar costs also pushed the implied cost of one-week offshore borrowing, shown in the top-right panel, above the rate on foreign central banks' one-week U.S. dollar auctions. Amid the shift in market pricing, we observed higher demand at the BOJ and the ECB dollar auctions over the June quarter-end and some modest usage in the operations that have followed, as shown in the middle-left panel.

Turning to organizational matters, the middle-right panel summarizes the staff's work to modernize the documents governing foreign currency operations. The staff had three objectives in conducting this work: first, to have the documents reflect the current operating environment; second, to clarify policymaker guidance to the Selected Bank; and, third, to improve the documents' organization.

To achieve these objectives, the staff has undertaken a substantial rewrite of the documents, with the proposed updates reflecting a significant number of changes to the existing governance of the foreign currency operations. In view of the number of changes proposed, we want to ensure that you have enough time to review them before you're asked for a vote. We plan to send you the updated documents and an accompanying memorandum within the next few weeks and to request a vote to approve these documents at the September meeting.

Pending approval of the governing documents in September, the Desk staff plans to begin implementing the new investment framework for the management of the foreign reserves portfolio shortly thereafter. As discussed at the April meeting, key features of this new framework include establishing a process for assessing policymakers' investment preferences for the period ahead and using a more robust risk–return methodology that incorporates those preferences.

Lastly, I want to mention two operational developments. First, last week JPMorgan Chase announced its plans to exit the provision of settlement services for OMO-eligible assets by mid-2018. At that time, Bank of New York Mellon is expected to become the sole service provider supporting the clearing and settlement of our domestic open market operations. JPMorgan's announcement will not affect the services it provides as custodian for SOMA agency MBS holdings. Second, the staff conducted one small value operational test over the intermeeting period. Information on this test, along with a list of upcoming exercises, is summarized in the appendix. Thank you. That concludes my prepared remarks.

CHAIR YELLEN. Thank you. Are there questions for Lorie? [No response] Hearing no questions, we need a motion to ratify domestic open market operations.

MR. FISCHER. So moved.

CHAIR YELLEN. And without objection. Okay. Let's move along then to the economic and financial situation, and Steve Kamin is going to start us off.

MR. KAMIN.³ Thank you, Madam Chair. I'll be referring to the materials titled "The International Outlook."

Let me say at the outset that if I never hear the word "Brexit" again, it will be way too soon. If you are of the same mind, we are in for much disappointment, because like campaign robocalls, Pokemon Go, and, as always, the Kardashians, we're going to be hearing a lot more about Brexit than we'd like in the coming months. In fact, newly installed Prime Minister Theresa May has stated that she is not even going to initiate the formal process of pulling Britain out of the EU until early 2017, and after that, talks on a new trade deal will drone on for at least two years. Once the bureaucrats start hashing out the details, the best we can hope for is that the negotiations will be excruciatingly boring. At worst, well, I'll get to that shortly.

It is still early days, of course, but at least for now, Brexit has turned out about as well as we might have expected. As Lorie has described, outside of Europe, global financial markets have largely reversed their earlier losses, and the dollar—which is a key channel through which foreign events affect the U.S. economy—is up only about 1 percent since your June meeting. So, with financial and confidence spillovers from Brexit largely contained, we see the main effect of Brexit on our baseline foreign outlook being the hit to the economies of the United Kingdom and the euro area, with some fairly small knock-on effects on other foreign economies operating mainly through trade channels.

Given that we've never seen an event like Brexit, how do we calculate its effects on economic growth in the United Kingdom and the euro area? The reduction of

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

trade in goods and financial services should exert some long-term depressive effect on productivity and output, but we believe the more immediate and tangible effects will come through Brexit's effect on uncertainty, confidence, and financial conditions. As indicated in panel 1, the Baker, Bloom, and Davis measure of economic policy uncertainty has ratcheted up this year in both the United Kingdom and the euro area, as have measures of financial stress, shown in panel 2. To get some sense of the economic effect of these developments, we estimated a vector autoregression model that includes the uncertainty index, financial stress, GDP, and several other variables. Drawing on this model, we estimate that heightened uncertainty and financial stress should depress U.K. economic growth quite noticeably over the next year relative to our June projection, as shown by the red solid and dashed lines in panel 3, while euro-area growth, the blue lines, also slows, albeit to a smaller extent. Later in the forecast period, as progress in Brexit negotiations leads to greater clarity about the economic outlook and thus revived confidence and spending, our new growth projections converge toward those we wrote down in the June Tealbook.

Notwithstanding Brexit's significant hit to European growth, the effect on the global economy should be relatively muted. As shown in panel 4, the United Kingdom accounts for only about 3½ percent of U.S. merchandise exports, while the euro area amounts to about 15 percent. And outside of Europe, the outlook is little changed from the June Tealbook. Accordingly, as shown by the black solid line in panel 5, we have revised down our trade-weighted aggregate of foreign GDP growth only about ¼ percentage point in the second half of this year and 0.1 percentage point next year. As Brexit effects wane by the end of the forecast period, economic growth in both the EMEs and AFEs should be running at roughly their trend paces.

Although the effect of Brexit on our baseline projection is relatively muted, Brexit has revived some serious downside risks for the euro area. First, there is some chance that the result of the U.K. referendum will provide the impetus for anti-EU groups elsewhere in Europe, which already have been gaining political ground in many countries, to either seek similar votes or to restrain the power of EU institutions in other ways. As shown in panel 6, a survey of EU residents conducted in November 2015 indicated that, outside of the United Kingdom, people generally favored staying in the EU, but sizable minorities favored leaving and the U.K. vote could boost those numbers. The threat of a withdrawal by a continental European economy would create serious concerns about the viability of the euro area and likely trigger a return of the financial stresses seen during the euro zone crisis in 2011 and 2012.

Now besides that, Brexit has revived worries of a crisis in European banking. For several years, European banks have struggled with low capitalization and poor profitability, reflecting—to varying degrees—a weak economic environment, shallow yield curves, low-to-negative interest rates, inadequate cost containment, and, as shown in panel 7 on your next exhibit, elevated nonperforming loans. As Lorie has described, following the Brexit vote, stock prices of European banks fell especially sharply. For the most part, these declines reflected concerns about profitability rather than solvency, as investors worried that lower economic growth and lower interest

rates would further depress bank returns. However, Brexit has also shone the spotlight on banks in serious need of recapitalization. This spotlight is all the brighter because in three days, the European Banking Authority will be publishing the results of its EU-wide stress test, and banks viewed as having inadequate capital will likely come under additional pressure.

Some of the banks likely to fare poorly in the stress test are in Italy, where NPLs amount to 18 percent of loans and loan loss provisions are inadequate. Weaker-than-expected results for a major Italian bank could create funding problems for Italian banks in general if markets came to believe that the problems faced by Italian banks were not going to be addressed. Such tensions could, in principle, lead to heightened financial stresses in other peripheral economies, renewed pressures on peripheral government finances, and, in the worst-case scenario, a return of the euro-area debt crisis. However, for this to happen, many policy missteps would have to occur. Estimates of the cost of a credible recapitalization of all Italian banks start at about €45 billion. This is a manageable figure, amounting to less than 3 percent of Italian GDP, and well below the European Stability Mechanism's remaining lending capacity of €370 billion. The key stumbling block so far has been that the EU's new bank resolution rules require any public recapitalization be accompanied by the bail-in of a wide range of claimants, including unsecured bondholders and uninsured depositors. This is a particular problem for Italy, where many unsecured bonds were sold to retail customers as if they were safe deposit accounts, and forcing those customers to take losses would be politically dangerous. At present, the Italian authorities are working with EU officials on a solution to the problem. The solution will likely involve less ambitious recapitalization, targeting just a few banks, probably involving some private funds, and perhaps exploiting existing exceptions in the bank resolution rules. A strategy along these lines will probably suffice to keep a lid on Italy's banking problems for the time being, but the pot could certainly boil over at some future point.

Besides depressing growth and posing downside risks to the European economy, Brexit appears to have triggered a further notch downward in global interest rates, as shown in panel 8. We now expect that in response to weaker economic prospects, the Bank of England soon will cut its policy rate 25 basis points to $\frac{1}{4}$ percent and resume asset purchases, and the ECB will both cut its deposit rate an additional 10 basis points to negative $\frac{1}{2}$ percent and extend its asset purchase program by an additional quarter to mid-2017. With Japanese economic growth and inflation also flagging, we think it likely that the BOJ will also bolster its accommodation, probably through a rate cut and stepped-up asset purchases.

Not surprisingly, the value of the dollar against the AFEs has risen over the intermeeting period, as shown by the green line in panel 9, and we have accordingly revised up our forecast path for the dollar against those currencies. What is more surprising is that the value of the dollar against EMEs, the blue line, is down slightly over the period. In fact, as shown in panel 10, since the Brexit vote, EME assets have been experiencing a boom, with flows into emerging market funds soaring and credit spreads narrowing sharply.

The source of the recent strength in EME assets has important implications for the outlook for the dollar. If this strength largely reflects a relief rally following the passing of the Brexit risk event, coupled with some impetus from further declines in interest rates in Europe and Japan, gains in EME currencies might persist, consistent with the path of the dollar against EMEs, shown in panel 9. Conversely, if the boom in EME assets and, in fact, risk assets more generally is being supported by investor expectations of easier U.S. monetary policy, as Lorie discussed, then investor surprise at FOMC tightening could boost the dollar much more sharply than in our forecast against both the AFEs and EMEs.

To be sure, we already are anticipating some rise in the dollar as markets discover that the FOMC is tightening by more than they expected. That is why the dollar rises against AFE currencies in our forecast. This Federal Reserve surprise effect is offset for the EMEs by our assumption that the Chinese RMB will end up rising against the dollar over the forecast period. But as indicated by panel 11, the sensitivity of the dollar to changes in interest rates may now be higher than we are assuming. The blue dots and blue regression line show that over the period from January 2010 to April 2014, following FOMC announcements, increases of 1 percentage point in interest rate differentials were associated with a 2.1 percent rise in the dollar against AFE currencies. We are currently assuming a dollar sensitivity of 2.5 percent in our forecast. But, as indicated by the red dots and regression line, from 2014 to the present, the sensitivity of the dollar to interest rate surprises has risen to about 4.5 percent. Accordingly, the dollar may rise by more in response to a U.S. monetary policy tightening than we are currently assuming.

Another upside risk to the dollar forecast is posed by China. As indicated in panel 12, we are currently assuming that the RMB will stabilize over the next year before appreciating thereafter, consistent with China's still-high productivity growth and mounting trade surpluses. However, with China apparently content to let the RMB depreciate to support growth and with markets continuing to fret that growing corporate debt could lead to a hard landing, there is some chance that a reemergence of heavy capital outflows could keep the RMB moving downward.

To conclude, both the normalization of Fed policy and prospects for China pose upside risks to our dollar forecast. Over the coming intermeeting period, we will be considering how much of this upside might be worth incorporating into our baseline projection. David will now continue our presentation.

MR. WILCOX.⁴ I'll be referring to the packet titled "The U.S. Outlook."

The biggest surprise regarding the baseline outlook for the U.S. economy may be how little it has changed since June despite—among other developments—the event that Steve Kamin would prefer shall not be named. Accordingly, I will be relatively

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

brief in my coverage of the usual forecast update and instead provide a broader review of the recent contour of the recovery.

The first panel of your forecast summary exhibit shows how various nowcasts of second-quarter real GDP growth have evolved since the time of the June Tealbook. Generally speaking, the nowcasting operations maintained at the Reserve Banks, which are shown by the dashed lines, like the Board's judgmental forecast (in black), saw the incoming data during the intermeeting period as continuing to point to second-quarter GDP growth in the neighborhood of 2 percent. On the basis of our own track record over the past decade, we estimate that there's a 70 percent probability that the BEA's first estimate, which it will publish this Friday, will lie between about 1½ percent and 2½ percent. Of course, the BEA's first estimate will then be revised over time, so uncertainty about the *true* rate of growth of real GDP in the second quarter is much greater than that.

As for the labor market, the June employment report substantially alleviated the concern we had at the time of the June meeting that a broader deterioration in real activity might have been in train. Welcome as that report was, I would hasten to note that what one report delivered in terms of reassurance about the vitality of the recovery, another report could just as easily take away.

Taking a longer-term perspective, the pace of improvement in the cyclical position of the economy does seem to have slowed in recent quarters. The clearest window onto this slowing is given in panel 2, which shows the Board staff's judgmental estimate of the output gap—the broadest measure of resource utilization in our framework. After having narrowed reasonably rapidly during the preceding couple of years, the output gap by our reckoning has been roughly flat since the middle of 2015.

Assuming that our characterization of recent history survives the upcoming annual revision to the national accounts, which is also scheduled to be released on Friday, two questions immediately arise, as we noted in the Tealbook: First, why did the slowing occur? And, second, what does it portend for the future?

Regarding *why* it happened, one important cause of the slowdown has probably been the appreciation of the exchange value of the dollar since mid-2014, and the associated deeper factors that gave rise to that appreciation. As you can see from panel 3, the broad real dollar is currently more than 16 percent stronger than we thought it would be as of the July 2014 Tealbook. As Glenn Follette emphasized in his briefing yesterday, business fixed investment has been unexpectedly weak recently and inventory investment has slowed from its rapid pace of a year ago. These developments may themselves partly reflect the appreciation of the dollar rather than be additional to it.

In our assessment, the dollar effect helps to explain why the pace of cyclical improvement slowed as much as it did during a period when you increased the target range for the federal funds rate only 25 basis points and the size of the SOMA

portfolio relative to GDP didn't change very much. Indeed, one can even argue—given the downward adjustment in market expectations for the trajectory of the funds rate over the next few years—that the overall stance of monetary policy actually has eased since mid-2014. A natural interpretation of all of this is that the appreciation of the dollar since 2014 and all the factors that gave rise to that appreciation put a substantial restraint on domestic economic activity—a restraint that we estimate to be in the neighborhood of about 1 percentage point off the growth of real GDP both last year and this year.

Thus, the dollar and the other factors that gave rise to dollar appreciation plausibly substituted, in effect, for tightening that you might have otherwise had to provide in the form of more aggressive increases in the funds rate. The FRB/US model can give one rough estimate of the magnitude of the substitution. According to the model, the unanticipated rise in the dollar's exchange value over the past two years was equivalent, in terms of its effect on the output gap, to an increase in the federal funds rate of something like 150 to 200 basis points.

Turning to the second question that I posed earlier, if the stronger dollar played an important role in generating the recent cyclical slowing, what does that portend for the future? In particular, does it make sense that, in the baseline forecast, we have the pace of resource tightening picking up steam again even as the funds rate moves up more decisively? The answer is that, with dollar and other associated effects waning, there is room *both* for the pace of resource tightening to pick back up to a slightly more vigorous pace and for you to resume a program of gradually bringing the funds rate up to its neutral level over the next several years.

Panels 5 and 6 show the evolution of two key indicators of labor market conditions broken out by race or ethnicity. Broadly speaking, as shown in panel 5, the unemployment rates for Hispanics or Latinos and for blacks or African-Americans historically have tended to follow the main contours of the unemployment rate for whites, but with a higher intercept and a larger cyclical sensitivity. An ocular regression suggests that there may have been some modest improvement in the relative experience of Hispanics over the past decade but not of blacks, and an actual computer-based simple linear regression—albeit one that makes no attempt to control for changes in age, education, or other relevant characteristics—corroborates that ocular impression. Panel 6 presents similar estimates for the so-called U-6 rate, which includes marginally attached persons and people working part time for economic reasons. These estimates were prepared by the staff here at the Board using microdata from the CPS. This measure tells roughly the same story. It is certainly discouraging that neither the black–white nor the Hispanic–white differential in either measure is materially smaller than it was a decade or two ago.

Although our baseline assessment of the outlook for real activity isn't much different from June, our perception of the risks to that outlook has been torqued in different directions on the basis of domestic and foreign considerations. On the one hand, the most recent labor market report provided welcome reassurance that the labor market continues to improve, and this suggests that near-term domestic risks

have receded. On the other hand, I would note that at the time of your June meeting, the U.K. vote was still seen through the windshield, not in the rearview mirror. While the relatively calm response of financial markets in the short amount of time that has transpired since then is also reassuring, I would argue that the vote to leave, which we and others certainly didn't expect, opens up a range of possibilities that we would have dismissed if the vote had come out the other way, and none of those possibilities look appealing.

The exhibits on the next page summarize the inflation outlook. Our projections of both headline PCE inflation—panel 7—and core PCE inflation—panel 8—are essentially unrevised from June, reflecting both incoming data that have been unusually cooperative and revisions to the medium-term determinants of core inflation that have been quite small. We continue to expect core PCE inflation to step down modestly over the second half of this year. As we have noted before, this pattern is partly attributable to the residual seasonality that the BEA has thus far not succeeded in expunging from the PCE price index. In addition, we think that first-quarter core inflation was temporarily boosted by some outsized gains in a few erratic components.

The next two panels reproduce the Tealbook's inflation monitor exhibits, which show the cumulative revisions since December of last year to our projections for total and core PCE inflation and take a first cut at parsing out the sources of those revisions. As you can see, the revisions have been mixed but, generally speaking, not very large in either direction thus far. Focusing on the outlook for core inflation, reported in panel 10, the bulk of the upward revision to our forecast of core inflation this year reflects an upward surprise in the first quarter that we have mostly interpreted as noise. On the other hand, we've shaved a cumulative tenth out of our forecast of core inflation in 2017 and 2018, reflecting, as you can see, a variety of very small factors.

Panel 11 shows three of the measures of labor compensation that we follow. In recent years, nominal labor compensation growth has been relatively subdued in the face of a steady reduction in labor market slack, although there are signs of a pickup more recently in some measures. As Glenn Follette also discussed in his pre-FOMC briefing, we think that the recent evolution of compensation can be reasonably well explained by the behavior of trend real wage growth (which is itself related to the growth rate of structural productivity), trend price inflation, and the staff's estimate of the unemployment gap. Panel 12 uses one of our models to decompose movements in the ECI into the contributions of these various factors. As you can see from the red portion of the bars, the model does view the reduction in labor market slack that has occurred since the beginning of the recovery as a source of upward pressure on compensation growth. However, that effect has been largely offset by a reduced contribution of trend real wage growth—the green portion of the bars—that in turn reflects a slowdown in structural productivity growth. Overall, this model isn't particularly puzzled by the recent behavior of either the ECI or the productivity and cost measure of compensation per hour. At this point, I'll turn it over to Michael.

MR. KILEY.⁵ I'll be referring to your handout on "Financial Stability Developments." My briefing will review developments since our last readout in April, drawing on the quarterly quantitative surveillance report you received last week. As we highlighted in the report, we continue to see the overall vulnerabilities in the United States as moderate, primarily due to the strong capital and liquidity positions in the banking sector, moderate growth of nonfinancial credit, and lack of widespread valuation pressures.

The period since our last assessment included the decision by the United Kingdom to leave the European Union. Note that I avoided the "B word" to spare Steve, but I might not be able to keep it up. As Lorie and Steve have already discussed, the outcome of the referendum led to sharp declines in risk asset prices and volatility in financial markets that quickly receded. The first two panels of exhibit 1 illustrate some developments in market functioning. Foreign exchange markets experienced large volumes and some temporary modest strains, with bid-asked spreads (illustrated for the euro in chart 1) briefly widening to levels far above intraday norms. Turning to fixed-income markets, our recent assessments have highlighted the concerns expressed by some market participants and others regarding reductions in liquidity. As can be seen in chart 2, bid-asked spreads for investment-grade corporate bonds, the black line, widened around Brexit but not to an unusual extent.

Stepping back from specific developments, the Brexit experience was a significant real-time, albeit anticipated, stress test of the global financial system. Reports indicate that trading remained generally orderly and liquidity across markets held up reasonably well. In addition, supervisory data suggest that unscheduled margin calls were substantial in the immediate aftermath of Brexit but were met without any significant incidents. Financial markets and institutions have been resilient to the shock to date, which may in part reflect early preparations by a wide range of market participants, reduced leverage in the system, and communications from central banks that they would take the steps necessary to provide liquidity to support the orderly functioning of markets.

While the prices of many risk assets have more than fully recovered from their post-Brexit lows, this is not true of European bank stock prices, as Steve and Lorie already highlighted. Equity prices of large European banks, shown in chart 3, fell substantially, and the prices for Deutsche Bank, Credit Suisse, and Barclays have recently been near or even below the lows hit during the worst of the European debt crisis in 2011 and 2012. In contrast, the stock prices for U.S. banks have largely recovered from their post-Brexit decline and remain notably above their 2011 low. The relative outperformance of U.S. banks undoubtedly is due importantly to the relative strength of the U.S. economic recovery, although the improvement in loss-absorbing capacity at U.S. banks likely also plays a role. As shown in chart 4, the largest U.S. banks all met their fully phased-in Basel III common equity tier 1 ratio as of early this year; moreover, all of the U.S. banks participating in this year's CCAR

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

received nonobjections to their capital plans after demonstrating that their capital levels were sufficient to withstand a severely adverse global recession. The underperformance of European banks reflects a number of factors, including the weaker outlook for economic growth in Europe, the further drag on already thin net interest margins from low—indeed, negative—interest rates, and greater concerns about the quality of their loan books. As Steve just mentioned, Italian banks have been under particular pressure recently, and the results of the EBA’s stress tests—to be released this Friday—and any related policy actions bear close watching.

An important link between European financial institutions and domestic financial stability comes from the sizable exposures of prime money market funds to Europe, illustrated in chart 5. Overall exposures were more than \$500 billion, on average, in recent months. Much of this exposure consisted of certificates of deposit and commercial paper from financial institutions. Looking forward, on October 14, new SEC regulations governing money market funds take effect. Under the new rules, prime institutional funds will be required to float their daily net asset values and have the ability to impose fees and, indeed, outright restrictions, or “gates,” on redemptions. In response, and as discussed earlier by Lorie, a number of funds have converted to types less influenced by the reforms, with the most common adjustment involving conversion to a government-only fund. In addition, money fund managers are preparing for potential withdrawals by investors who want to avoid the new regulations and, as shown in chart 6, have shortened maturities and built liquidity buffers in response. A survey of money fund managers conducted by the Desk reported projected additional redemptions from prime funds could be on the order of several hundreds of billions of dollars. While the reforms should improve the stability of money market funds, there could be some short-term disruptions to wholesale funding markets if large unexpected withdrawals were to occur. In particular, some foreign banks could experience difficulties in obtaining dollar funding.

Your next exhibit presents developments in nonfinancial credit and asset valuations. Overall, nonfinancial credit has grown at a rate roughly in line with nominal GDP (not shown), and we continue to see vulnerabilities stemming from nonfinancial borrowing as moderate overall. In the nonfinancial corporate business sector, leverage continued to increase, as shown in chart 1, and leverage among speculative-grade and unrated firms—so-called high-risk firms—is now quite elevated. High leverage among risky firms leaves them vulnerable to shocks. That said, the pace of borrowing by such firms has slowed over the past year, as shown in chart 2, in response to the increase in borrowing spreads (chart 3) and tightening in lending conditions seen since 2014.

Credit spreads have remained on the high side of historical averages this year, although they have clearly moved down from the levels seen early in the year. Anecdotal reports hint at some pickup in valuation pressures in risk assets from a view that extremely low (if not negative) yields in Europe and Japan leave the United States as the only game in town for investors reaching for yield. It remains too early to call a significant uptick in valuation pressures in the United States, and, for

example, the required return to equity (chart 4) remains near a historically typical level and the equity premium (the difference between the black and red lines in chart 4) remains relatively high. Of course, one reason that the equity premium has widened this year is the decline in Treasury yields, highlighting the potential dependence of asset prices on continued low longer-term Treasury rates.

The final two panels provide an update on developments in commercial real estate, in which rapid price appreciation recently has led us to highlight the notable valuation pressures emerging in this sector. Data through June point to continued price gains and declines in capitalization rates, as shown in the lower-left chart. As with equity valuation metrics, these capitalization rates do not suggest unusually low expected returns relative to Treasury yields, but their steady decline highlights the momentum in this sector. Nonetheless, there have been some indications of slowing investor appetite for commercial real estate. For example, the Senior Loan Officer Opinion Survey on Bank Lending Practices reported a significant fraction of banks tightening lending standards for CRE, shown on the chart to the right, in the first and second quarters of this year.

The last page of your handout presents our summary heat map of financial-sector vulnerabilities. As in previous assessments, valuation pressures, private nonfinancial-sector leverage, and maturity transformation all remain at the midpoint of our scale, while we judge vulnerabilities from financial leverage to be low. That concludes our set of remarks.

CHAIR YELLEN. The floor is now open for questions for any of our presenters.

President Bullard.

MR. BULLARD. Thank you, Madam Chair. I have a question on “The International Outlook”—exhibit 2, box 9, “Real Dollar Indexes.” You’ve got the dollar appreciating over the forecast horizon. One question you might ask is: Wouldn’t markets already have integrated all of the information that’s available, and, therefore, it wouldn’t really be very predictable where the trade-weighted value of the dollar was going to go?

MR. KAMIN. That insight is exactly right, and that is an important part of the way we forecast the dollar, which is to assume that everything the markets know or anticipate now is already incorporated into the current level of the dollar. The only reason why we would predict changes in the dollar—particularly the exchange rate against the advanced economies, whose exchange rates are determined by the market—is if we thought the market was going to learn

something later that it does not know now. In general, of course, we don't think we have any greater insight into future events than the market does. However, there is one area in which we think we might have some insight, and that's the assumption in our forecast that the federal funds rate will rise at a steeper gradient over the course of the forecast period than the market expects. So the market expects a relatively small amount of tightening over the next few years. We have built into our forecast a greater amount of tightening, so we assumed that as the market learns about that and is surprised by the upward shift in the federal funds rate, it will accordingly bid the dollar up, and that's the rationale for the upward tilt in our exchange rate.

MR. BULLARD. I see. But, actually, my own forecasts don't have that policy upswing. So I guess if you're applying this to what I have, then you'd say that maybe the dollar would even depreciate, or at least you would make no forecast about the dollar.

MR. KAMIN. That could well be. Our forecast regarding the dollar is part of the overall staff forecast of the U.S. economy and depends on the assumptions about U.S. monetary policy that are incorporated into our staff forecast.

MR. BULLARD. Thank you.

CHAIR YELLEN. Other questions? President Williams.

MR. WILLIAMS. I have a question, diving deep into the Tealbook forecast, and that's specifically about housing. You highlight in the Tealbook that the incoming data on residential construction suggest lower growth over the near term, but I'm a little bit puzzled by that. And, I'm thinking ahead to the wording in the draft statement that residential investment is "soft." Real residential investment increased at a rate of more than 15 percent in the first quarter. Outside commentators would describe housing—and this is how my own staff described it when we discussed it—as a sector in which housing starts, permits, and existing home sales have been

strong and have been in fact above expectations, and that any slowing that we've seen in the data may be just some weather effects, which have affected the timing of activity between Q1 and Q2. So I guess I'm asking for your help in thinking this through: If you have a really strong Q1, partly boosted by weather, and then a little bit of a takeaway in Q2, how do you view that? And why would that make your forecast more negative about Q3 and Q4?

MR. WILCOX. By our lights, starts and permits data have been disappointing over the past couple of months. And, basically, the permits numbers, which give a much higher signal-to-noise ratio reading on the underlying pace of activity, have been about flat since December of last year. So we marked down our near-term forecast of single-family permits from the June Tealbook to now.

Now, part of the reason why the residential investment figure in the national income and product accounts is so strong in the first quarter was that there looks to have been a very large spike in single-family starts in February; the series for single-family starts is pretty noisy. We think that most of that is just statistical noise around a much steadier trend that's formed by the adjusted single-family permits. The starts number does feed mechanically through in a distributed moving lag into the residential investment, but what we think basically is going on there is that the BEA is feeding through a distributed moving lag of noise into the national income and product accounts, and the permits numbers—which are not based on a sample but are essentially a census of permits issued across the country—just give a much smoother picture. And those numbers continue to disappoint. We've been steadily marking down our assessment. We still think that the pace of construction is significantly below the demographically indicated pace of units to be added to the capital stock.

MR. WILLIAMS. I agree with the latter point. I guess I'm going back to this characterization of residential construction as being soft when it's been growing, whether there is statistical noise or not. If it's been growing very rapidly and it just doesn't keep growing or it declines a little bit, that just seems a funny way to characterize residential construction.

MR. WILCOX. Permits have been basically moving sideways since the beginning of the year, and we think that's just a much better gauge on the pace of activity.

VICE CHAIRMAN DUDLEY. John, is your concern that it's an untrue statement, or is your concern that because it's included in the statement, it suggests that the Committee is putting too much weight on it?

MR. WILLIAMS. Of course it's the latter, right? Otherwise, I wouldn't be talking about this. So if you look at business investment, that has been slow, negative for quarter after quarter—there's no question that's been a negative. But right after, we get a torrid—a term we used back in the '90s—rate of growth in a category, 15.6 percent, and then it falls by—I think we're writing down minus 3 percent for Q2, something like that—it just seems a little funny to describe that as a “soft” sector, as opposed to business investment, which has clearly has shown ongoing weakness rather than a big movement up and a little movement down. Even though you're saying permits are roughly flat, starts have moved up and then they've moved down, and it just seems it's harder to describe to the public why something that has been growing very rapidly is “soft.”

VICE CHAIRMAN DUDLEY. Of course, paragraph 1 is almost always characterized as something like “data received since the previous meeting,” so we're not stretching back over to the beginning of the year.

MR. WILLIAMS. Right, but it's the level—“soft” is a level in a way, I think.

VICE CHAIRMAN DUDLEY. Look, I have some sympathy for your point, in the sense that I'm not putting a lot of weight on that softness, But I agree with the staff that it is soft over that interval.

MR. TARULLO. So is "soft" a relative or absolute term?

MR. WILLIAMS. Well, I would like to go back to what David said. The first-quarter growth rate was 15.6. So you said some of that is "noise." Even if we take that at face value, then you're really just saying that you're taking that noise out of Q2, right? You're saying that the level over the two quarters is going to be up by—I'm going to have to do this math in my head—15.6 minus 3.2 divided by 2. [Laughter] So the level is up quite a bit. Say there's a little bit of noise that pushed up that Q1 number, and you're taking that away in Q2. That's still not soft, in my view. It's really about quarterly growth rates having some ups and downs—a theme I'm going to come back to tomorrow—overemphasis on quarterly ups and downs in some of these data series. And we know that residential investment has a lot of quarterly volatility in it.

MR. WILCOX. I really don't want to go to the mat over this issue that's worth a few basis points in terms of its contribution to GDP. If we're going to get out the number two pencil and put a really fine point on it, we were disappointed by the most recent data on starts and permits. We've marked down our near-term trajectory for single-family permits—it's a little lower, it's a little flatter than what it has been before. The trajectory of single-family permits is essentially flat since the beginning of the year. To use Governor Tarullo's typology, I guess my answer would be "yes," it's soft in relative terms and in absolute terms. We're significantly below where we think the demographically indicated or neutral level of construction is. We're not going to get there for years, and the most recent tranche of data was a little disappointing.

MR. WILLIAMS. So, again, I'm going to drop it too—but in a moment. [Laughter] And I will have an open mind. Our June statement said, “Since the beginning of the year, the housing sector has continued to improve.” So you would say, “That’s no longer as true as it used to be,” and you could just kill that sentence. But what we’ve done instead is to say, “Let’s kill the ‘has continued to improve’ and say ‘is soft.’ ” That’s two notches down. That’s all. I’m done. [Laughter] Thank you, Madam Chair.

CHAIR YELLEN. Okay. Other questions? Governor Fischer.

MR. FISCHER. I think this probably goes to Steve. On the broad real exchange rate, we talk about the massive appreciation of the dollar. I’m looking at the Wilcox presentation, page 1, chart 3. That shows that from the middle of 2014 to now, we went up from 93 or thereabouts to 110, and that the increase took place, in essence, over two years. Then we’ve basically got it just staying flat here. I’m kind of puzzled, because whenever I listen to what we’re told about what the exchange rate has done, the story varies—“recent changes in the exchange rate reduced GDP growth 1½ percentage points, or ½ percentage point, or something.” And then I listen the next time, and that number has been changed because something else happened. So do we have a reliable set of data on what has happened to imports or exports because of the exchange rate, particularly imports?

MR. KAMIN. I don’t have that off the top of my head, but I could certainly calculate that for you. I will say that a couple of things are worth pointing out. Broadly speaking, our exports over the past year or so have been flat. And that would compare in some kind of steady state—normal conditions—with export growth of 3 to 5 percent. So, very clearly, the rise in the dollar has depressed the growth of exports. Now, the rise in the dollar should have also led, given normal GDP growth in the United States, to strong increases in imports. And as a result of

that, we should have seen pretty substantial subtractions from GDP growth from net exports. We actually have not seen that in the past few quarters. In the first quarter, net exports actually contributed 0.1 percentage point to U.S. GDP growth. In the second, we estimate that it subtracted about one-tenth, and there were similarly smaller numbers in the last quarters of 2015.

With the dollar depressing exports pretty much as we would expect, the mystery in some sense is why imports have been so weak. And one possibility, of course, is that somehow exchange rates no longer are a relative price that would affect the choice between domestic and imported goods. We have no reason to believe that is the case, although we are certainly exploring that. Our best hypothesis as to what's going on is that some components of U.S. domestic spending that are particularly intensive in imports, particularly consumer durables and equipment investment, have been quite weak, and that has been exerting a downward effect on imports. That hypothesis is substantiated, or at least given support by, the fact that models that we've estimated in which imports rely not on aggregate GDP growth but rather on the growth of those particular expenditure components I just mentioned do a better job of explaining the weakness of imports recently. By that metric, the reason that net exports are not taking away as much from GDP growth as we might imagine is not because the exchange rate appreciation has had no effect, but rather because other shocks to domestic spending have offset. So, by and large, we think the exchange rate mechanism still works. Appreciation of the dollar has, indeed, cooled exports, but other developments in domestic spending have offset the exchange rate effect and depressed imports and have thus led to a smaller net exports drag than we might have anticipated.

MR. WILCOX. And that the dollar appreciation probably plays some role in explaining why investment has been as weak as it has been.

MR. KAMIN. Oh, absolutely. Right. That's a good point because that would be a knock-on effect that would not be captured just by the net exports components. In other words, if manufacturers and exporters more generally were very chagrined about their future profitability prospects, and they reduced investment, that would not show up in net exports, exactly, but it would still be a drag on U.S. GDP growth attributable to the appreciation of the dollar.

MR. FISCHER. Okay. Thank you.

MR. WILCOX. So just to put our dirty laundry out a little further, it's not unusual for us to be unable to trace dollar effects in the neat way to net exports so that the arithmetic lines up. Nonetheless, when we take more of a top-line view of real GDP overall, the model estimates are loose and imprecise, but they are rules of thumb, which were the basis for the figures that I cited. They continue to point to magnitudes of overall GDP effects that are in line with what we've got built in. It's an uncomfortable fact that tracing it through only to exports and imports doesn't work very well.

MR. FISCHER. Thanks.

CHAIR YELLEN. Further questions? President Lacker.

MR. LACKER. Yes. I was wondering what you know about why you now expect such a large drop in defense in the second quarter—the revision happened over just one meeting. Also, is there payback? And do you spread out the payback?

MR. WILCOX. We've been surprised by how weak defense spending has been. Glenn Follette is here and can provide more details.

MR. FOLLETTE. Yes, we've been surprised at how weak defense spending has been. [Laughter] That's the reason for the large downswing in our Q2 forecast. We expect that

spending should come back, but it's not guaranteed to come back next quarter and could be spread out over time. And so in the forecast we have defense spending coming back over the next couple of years.

MR. WILCOX. One way to put it, in sort of Washington-area lingo, is that—Glenn, help me out here—there's been no surprise in defense appropriations, but for reasons not particularly apparent to us the spend-out from the appropriations has just been slower than expected. However, it's going to be in the pipeline. We haven't, as Glenn mentioned, built an immediate snapback in the level, but they will get those authorizations spent eventually.

MR. FOLLETTE. So the appropriations that they approved last December are for a fiscal year, but those typically get spent out over a period of four or five years—about 60 percent in the first year and the rest after that. But it's not always 60 percent—55, 65, whatever—so there's some noise in the series.

MR. LACKER. Thank you. For what it's worth, a contact of ours, a director in a large defense contracting firm, when asked about this, cited some large contracts whose awards were delayed. Our contact also suggested that at this time of the year—in an election year, with a change of administration—typically, a lot of the workforce who do the contract awards leave, so there are sometimes some delays from that as well, but it could come back in a couple of quarters after that. So I'll have to wait and see. Thanks.

CHAIR YELLEN. Other questions? [No response] Okay. There's an opportunity now to comment on financial stability issues, and I've got two people on the list. Anybody else who wishes to comment is welcome to do so as well. President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. The QS report highlights the fact that CRE overvaluation remains a concern. It concludes that the effects of a sizable decline in CRE

prices on financial stability are likely to be small. I remain concerned that the financial-stability risks associated with CRE are elevated.

Out of the \$3.6 trillion total commercial mortgages and multifamily residential mortgages, \$1.8 trillion are held by the banking system. Among asset classes held by leveraged institutions, it is large, although not concentrated in particularly large institutions. It is also true that a significant decline in the CRE market is unlikely to occur in isolation. However, if the economy does weaken, I expect that a large decline in CRE collateral value risks significantly reducing access to credit to all but the most creditworthy borrowers. Such conditions conform well to the classic determinants of financial-stability problems—collateral values fall, and payment streams are interrupted. Commercial and residential price declines account for most of the significant international financial problems in the postwar period in advanced countries. Once prices fall, it is obviously too late to act preemptively. Thus, now is a great time to test the effectiveness of our preventive actions—a time when persistently low interest rates are encouraging “reach-for-yield” behavior that may eventually be disruptive.

One simple anecdote illustrates my concern. In the third quarter of 2014, my staff produced a table of banks with the highest ratios of total CRE to risk-based capital. Among those 50 institutions, 11 have already failed. My concern is particularly heightened because these banks have been unable to survive despite an improving economy, low interest rates, and generally rising commercial real estate prices. These 11 banks with high CRE concentration levels represent the preponderance of the total 15 bank failures that have occurred recently. While failing in the current environment is likely illustrative of problems well beyond just commercial real estate exposure, there would seem to be an exposure level that is sufficiently

high that it reflects poorly on management decisions and results in an unsafe and unsound practice that should be limited. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Evans.

MR. EVANS. Thank you, Madam Chair. Over the past several weeks, we have heard a good deal of talk about investors reaching for yield. In using the word “reach,” this terminology presupposes elements of exuberance. But when you dig into some details, the recent commentary seems different than the kind of reach-for-yield behavior that often flashes red with respect to financial instability concerns. That kind of behavior represents short-term, speculative hot money—chasing nickels in front of steamrollers—with an eye toward a quick and seemingly costless exit through rapidly closing doors when all rates begin to rise.

MR. TARULLO. Yikes. [Laughter]

MR. FISCHER. We’ll keep an open mind. [Laughter]

MR. EVANS. It’s the kind of stuff that gave us the 2013 taper tantrum. At the moment, I don’t see this kind of activity as being behind recent market moves. Rather, to me, the recent behavior looks more like a capitulation to permanently low yields.

For example, our bank’s insurance financial monitoring team recently hosted a meeting for President Lockhart and me with seven life insurance executives. We heard about some substantial reassessments by real money managers with long investment horizons, and, of course, insurance companies are one big piece of this group. Many of these long-duration asset managers seem to be coming around to the view that persistently slow potential output growth here and abroad will keep real interest rates low for a long time—longer than they likely acknowledged one, two, or even three years ago. These investors now seem resigned to locking in the yields they currently can get on safe longer-term fixed-income instruments. This

investment behavior also seems consistent with what we're hearing from issuers of highly rated corporate debt. For instance, a contact at Ford referred to an astonishing fixed-income market in which high-quality debt is routinely oversubscribed.

I think the capitulation hypothesis has implications for our thinking about financial vulnerability surrounding potential future monetary policy moves. Real money investors resigned to lower rates in the long run seem less likely to think that an unexpected tightening will lead to substantially higher longer-term rates. Rather, such tightening would simply flatten the yield curve. This implies a reduced risk of outsized and persistent increases in longer-term interest rates if we have to raise policy rates somewhat more quickly than what is currently envisioned in the SEPs. Put another way, perhaps it is more the case that the decline in longer-term interest rates we've seen in the past year or so reflects lower expected policy rates over the longer term as opposed to the large declines in term premium, such as those estimated by our stationary mean-reverting affine finance models. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Is there anybody else who would like to comment on financial stability issues? You're welcome to weigh in. [No response] Okay. Seeing no takers, I suggest we begin our go-round on the economy, starting with President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. Since our previous FOMC meeting, stock prices are up, the 10-year Treasury yield has declined, credit spreads have narrowed, the VIX is below average, and the trade-weighted exchange rate is little changed. While the Brexit vote is likely to have negative economic ramifications for the United Kingdom and possibly for Europe, to date the effect on U.S. financial data has been quite benign. In addition, while we do not have much real data that reflect the post-Brexit period, the data just before Brexit were

positive. For example, employment rebounded strongly in June, allaying many of the concerns raised by the weak May employment report.

Not surprisingly, in light of the generally positive news, my forecast has changed little. It remains slightly more positive than the Tealbook forecast for the end of 2016, with real GDP slightly higher, core PCE inflation slightly higher, and the unemployment rate slightly lower. In essence, it looks quite similar to the July Blue Chip forecasts of these variables. Specifically, my forecast for the end of the year has an unemployment rate of 4.7 percent and core PCE only somewhat below 2 percent. Thus, I expect us to be quite close to achieving our dual mandate by the end of the year. Hence, it is not surprising that my forecast includes two increases in the funds rate this year, in September and December.

It is notable that the Tealbook expects the unemployment rate to fall to 4.3 percent by 2018. It is also notable that all of the scenarios modeled in the Tealbook result in an unemployment rate of 4.3 percent or lower, with the exception of the “Severe Financial Stress in Europe” scenario. While I am comfortable probing to determine how low the natural rate of unemployment may be, I view 4.3 percent as more of a plunge than a probe. It is not that tight labor markets have no benefits. I would like somewhat tighter labor markets than what we have now to offset some of the labor scarring that occurred in the Great Recession. However, history shows that when the unemployment rate gets as low as 4.3 percent, monetary policy tightens in an attempt to raise the unemployment rate back to full employment. But, almost always, our attempt to achieve a smooth landing ends poorly, as the unemployment rate responds much more than intended, resulting in a recession. What is striking when looking at unemployment over time is how rarely we are able to keep unemployment rates near anyone’s estimate of full

employment for an extended period. Put differently, part of achieving maximum employment is avoiding significant overshooting of full employment and the recession that typically follows.

One possibility for caution in continuing the normalization of the funds rate might be heightened uncertainty. The buoyant stock market suggests that this uncertainty is not weighing heavily on market participants. The widely used VIX measure of uncertainty is currently well below its norm. A new, broader measure of uncertainty is the news-based Economic Policy Uncertainty Index, which is available daily. After being low for most of the year, it spiked for a day or two on the Brexit news and is once again at relatively low levels. One might think that greater uncertainty would lead some forecasters to predict more dire economic outcomes. Instead, the Blue Chip's July survey of forecasters reported the average of the 10 highest forecasts of unemployment at the end of 2016 and 2017 at 4.9 percent and 4.8 percent, respectively. Perhaps the greatest tail risk right now is the one modeled in the Tealbook as "Severe Financial Stress in Europe." In that scenario, the unemployment rate peaks at 5.1 percent in 2017. Even so, we continue to raise the federal funds rate but at a slower rate than in the baseline and still noticeably faster than markets currently expect.

In summary, I expect that we are likely to be close to both elements of our dual mandate by the end of the year, and I do not see the risks to the economy as being particularly elevated. I will discuss tomorrow what that implies for policy. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Lacker.

MR. LACKER. Thank you, Madam Chair. Both of the Fifth District surveys, just released this morning, improved in July and are now in positive territory. On the manufacturing side, the composite index swung from minus 10 to plus 10, and the new orders component swung

from minus 17 to plus 15. On the services side, the overall revenue index rose from plus 2 to plus 8. The wage indexes are strongly positive across all sectors.

At the national level, in my mind, the overall outlook has not changed appreciably since the June meeting. Consumer spending gains are likely to account for most of the growth in real GDP this year, and the June retail sales report increased my confidence in the outlook for consumption. Other sectors are likely to contribute less to overall economic growth. Recent data suggest that homebuilding may have flattened out. We continue to hear frequent reports of residential construction being limited by shortages of buildable lots and skilled workers, so supply-side factors rather than softer demand may be what's limiting residential investment. This view is consistent with the home price inflation that we see in the CoreLogic repeat sales index and would point toward "soft" not quite the right adjective for the housing market.

Although business investment remains weak overall, there's been at least some positive news. In the latest estimate of first-quarter GDP, the growth rate for real intellectual property investment was revised from basically zero to more than 4 percent. And with the price of petroleum now above \$40 per barrel, the rig count has ticked up, suggesting that spending on new oil and gas wells has bottomed out. Along with the Tealbook, I expect investment in nonresidential structures to begin to grow again in the third quarter. There are even some signs of near-term firming in equipment. For example, one of our roundtable members from the trade association representing what we used to call "machine tools"—they call themselves the Association for Manufacturing Technology now—reported a substantial increase in requests for price quotations in recent months. At the end of each quarter, he surveys, a couple of dozen contacts within the industry. He expects the price quotations to lead to increased orders later this year and bases that on the rate at which these are converted. They're expecting a good finish to

2016 and things to pick up in 2017 by 10 to 20 percent. This seems consistent with the Tealbook outlook for investment in equipment. My overall outlook, then, is for strong growth in consumer spending and improving growth in business investment to offset a slowdown in housing and yield 2 percent real GDP growth for the next few quarters.

In the labor market, I think we should see falling employment growth this year and very little further decline in the unemployment rate. With the benefit of the June employment report, it now seems clear that the May payroll number was a fluke. That said, employment growth has averaged 147,000 jobs per month in the second quarter compared with 229,000 jobs per month last year. So it's pretty clear that we've seen some step-down in employment growth. But even at the current pace, the employment-to-population ratio would continue to rise, and that seems unlikely to go on for much longer. As I've been arguing since the beginning of the year, I think we should be prepared to see monthly job growth continue to fall, consistent with convergence to a more sustainable steady-state trajectory, notwithstanding President Rosengren's caution about actually being able to achieve that.

On inflation, I would note that in December, the Tealbook was forecasting 1.4 percent core PCE inflation for both Q1 and Q2 of this year. Now the forecast is for 1.9 percent for the first half, but the forecast for the second half is basically unchanged. Some of that first-half miss can plausibly be attributed to one-time factors and residual seasonality. But I doubt that all of the pickup in core inflation in the first half is going to prove short lived, so I'm expecting core inflation in the second half to come in close to 2 percent as well. Thank you.

CHAIR YELLEN. Thank you. Governor Fischer.

MR. FISCHER. Thank you, Madam Chair. If we remember where we were six to seven weeks ago, that's when we decided that the situation was significantly unclear. First, we had the

May hiring figure, which we then thought was 70,000—and now know to be 11,000—and we were worried that something bad was going on in the labor market. And then we had the U.K. referendum just a little less than a week after the meeting, and there was no good reason whatever to make a decision before we knew what happened there.

So we had two reasons. Now we have come through both those reasons pretty well. The employment number came out at 287,000 for June, as you know, and a little bit of arithmetic made that to be 147,000 per month over the previous three months, which was less than we had forecast four months ago but well above the estimates we have of how much hiring you need in order to keep the unemployment rate from rising. So that looked okay.

And then we had to think about Brexit, if you'll excuse the expression. I happened to be near the scene of the crime and woke up at about 2:30 in the morning and turned on the TV, and it was clear it was going to be a disaster, so I went back to sleep. [Laughter] At 5:30 or so you got the truth. That Friday morning there were quite a few people from the U.K. in the seminar we were in, and they and we all were feeling very unhappy, and we could imagine terrible scenarios of the breakup of the European Union and all sorts of things that were going to happen.

Well, where are we now? We shouldn't, I think, delude ourselves that the United Kingdom is in for an easy time. They have got a lot of negotiating to do. We always want structural change in Europe. Well, the British are undertaking a massive structural change. They are going to have to renegotiate their entire set of external relations. That's a lot of work. And then they're going to have to actually implement what they negotiated. So this is going to take a long time. It's going to be complicated and probably take five years until they have done most of what they need to do. And during that time we will get bumped around from time to time. In negotiations like that there are always crisis points, and there are late-night negotiations and

concern that the thing is about to break down, and at three o'clock in the morning it transpires that they got a compromise, and so forth. We're going to see those things coming our way from time to time, and they're going to make our environment a little bit more bumpy than we would have wanted, but they will make it a lot more bumpy for the United Kingdom, and they could make it more bumpy for the rest of Europe. There are very worrying scenarios about the future of the European Union. According to people I speak to and read about, the reaction in Europe actually, at this stage, is, "Gosh, we don't want to be in the situation like the British are in at the moment." So they think it strengthened the European Union. However this is after a month-plus, and the actual events are going to play out over several years. We know very little about what's actually going to happen.

I think that in terms of the United States, the United Kingdom is relatively small from our perspective, with the exception of the financial side, and that the effect on us will come in part through whether our banks stay in London and what happens to London as a great financial center. At this moment, the Europeans think they are going to attract it all to Europe. That's not entirely clear, but one hears stories about our banks planning their moves or moves of part of their corporations.

The first political news in the United Kingdom was the public opinion poll taken earlier this week, which showed people being very shocked and expectations being very negative. The Bank of England has made it clear it's going to do something at its August decision, and the ECB has been a little less clear that it's going to do something. But both of them seem to think they're going to do packages—that is, that it won't be just an interest rate reduction, but an interest rate reduction and some other elements of QE or possibly forward guidance or whatever

there is in the bag of tricks at that point. So something positive will come out of all that, but we're fairly ignorant.

There hasn't been a great deal of evidence of difficulty in the capital markets. In the case of the United Kingdom, the pound depreciated, as one would have expected. Interest rates are down significantly, as one would have expected. Bank share prices are down a long way, and there were rumors of liquidity difficulties in the first days after the referendum, and then there were those real estate mutual funds that had to suspend withdrawals. But it wasn't a huge thing. For the United States, aside from our banks, there hasn't been a whole lot of the share market that's been very affected. So it hasn't been big for us and probably won't be big for us, provided we continue to manage ourselves well.

But what about conditions in our economy? I'm impressed by the robustness of what has been happening. I keep thinking of the fact that we've just had a series of negative shocks. I feel very guilty about this, because when I arrived at the IMF in 1994, my arrival was followed three months later by the Mexican crisis, and there was a crisis every few months until the Argentine crisis when I left, and then nothing happened for three or four years. [Laughter]

MR. TARULLO. They were worried about having a crisis without you there, Stan.

MR. FISCHER. That's right. So I feel a little bit guilty about all of these things that have happened to us. But after the things that have happened to us over the past year or so, including the Chinese letting their exchange rate go—which they seem to be continuing to do in a very controlled manner at the moment as well—and then Brexit and a succession of things that worried us, the economy looks quite similar to what it looked like before except that we're on a lower path. Economic growth has been down a little bit, but we're expecting a catch-up. And somewhere in this economy and in the labor market, in ways we, or at least I, don't understand

there's something very robust that's been happening for a lot of years as employment growth continues, except for that terrible month that worried us.

If you look at the components of aggregate demand, PCE growth has contributed in a major way to GDP growth. Investment continues to be weak. I don't know if we can call investment performance "weak." Investment has been weak for a long time, and I think we may just be at a new normal on investment, although there are some stories now about U.S. oil production beginning to come back, and that would presumably bring with it some of the associated investment whose disappearance helped reduce aggregate investment for the U.S. economy.

If you look at the rest of the world, Europe is very unknowable. The Chinese are somewhere around 6 percent, which is fairly good. But the nature of Chinese economic growth has changed, and it's less investment intensive, so they're importing less from the rest of the world than they used to. It seems that what they were importing was based more on an acceleration model than on a straightforward multiplier model, and so that's a slowdown. And then Latin America is just changing disaster places. Now we've got Venezuela instead of Argentina and so forth, but there are some positive signs there. Africa doesn't look very good. India does look very good. So the rest of the world is not terrible, but it's not great.

If we look at other things that might happen here, the money market mutual fund reforms that are coming seem to me to be bothersome, but they're all anticipated, so maybe they're not going to be a bother. I think we can take some comfort in the fiscal policies we're going to get whoever wins the elections, because, as far as I can see, both candidates are going to raise spending. One's going to cut taxes—that's expansionary. The other's going to raise spending.

So a year from now we could have a fiscally driven expansion, if all works out, and that will be good for us. But, unfortunately, I don't know if we're going to have that.

I won't make any policy recommendations until tomorrow, but we're in a situation that is way better than we feared it might be at our previous meeting, and we're just probably going to wait a little while to see if the situation continues to strengthen. Thank you very much, Madam Chair.

CHAIR YELLEN. Thank you. President Lockhart.

MR. LOCKHART. Thank you, Madam Chair. I read the incoming data as largely consistent with the view of the economy summarized as follows: continuing moderate economic growth, near full employment but with some absorbable slack remaining, and signs of gradually rising price pressures with associated movement toward the Committee's target.

My Bank's tracking estimate for the second quarter now rests at a 2.4 percent annualized rate, a little stronger than the number in the Tealbook. In terms of the composition of GDP growth in the second quarter, distinctions between our assessment of the second quarter and the Tealbook are minor. Business investment remains soft, and that softness is broad based. The current strength of the economy is largely based on the strength of consumer activity. Reports from our retail contacts in my District this cycle confirm the strength in consumer spending. Most retailers reported healthy sales levels and a relatively optimistic outlook for the remainder of 2016. Tourism remains solid, and we heard of a shift in the composition of demand away from international visitors and toward domestic travelers. In recent meetings, I've passed along reports of our director who heads the nation's largest auto retailer. He continues to report very high sales volumes but cautions that high fleet sales are in the mix, and consumer sales are being maintained by substantial discounts and incentives. Whereas, after the May employment report,

there seemed to me to be some disconnect between data and anecdote, recent reports from our business contacts in the Sixth District are mostly consistent with my read of the incoming data.

My outlook for the economy remains unchanged from the June meeting and from my last SEP submission. My outlook resembles this meeting's Tealbook, with the only exception being that my forecast anticipates a slightly faster closing to the inflation target. Recent retail price reports are broadly in line with my assumption of firming inflation readings. These reports have been encouraging but not definitive. My staff cautions that recent component price movements underlying the inflation reports exhibit unusual disparity.

A key assumption in my outlook is an improvement in the pace of business investment. This assumption carries some risk. In the most recent contact cycle, my team took every opportunity to probe thinking on capital spending. While most of our conversations suggested some longer-term optimism about prospects for expansionary, capacity-building cap-ex, we heard little that would suggest a near-term resurgence in spending. Current capital investment is depicted mostly as replacement, oriented toward productivity improvement, or focused on cost takeout. Some contacts mentioned their excess capacity; we also heard comments on new foreign-sourced product competition responding to global capacity and the stronger dollar.

A number of companies repeated that M&A is their preferred growth strategy. Acquisitions bring their own incremental revenues and demand. Firms continue to be cautious about assumptions of organic growth. Businesses continue to report little in the way of direct pricing power. I would note, however, that some retailers indicated that price promotions had eased. Other firms indicated that they have been able to capture and retain commodity cost reductions in their margins. Finally, a number of public companies noted greater pressure

coming from investors to justify capital investments and, implicitly, higher return hurdles and shorter payback horizons.

So business fixed investment is a sphere of activity in which anecdotal feedback is not currently lining up well with my forecast assumption. At this time, I'm prepared to treat business fixed investment as a risk—the risk being a failure to realize an assumed upside. If improved business investment does not materialize, the outlook on which I'm premising further policy rate increases cannot easily rely on personal consumption in isolation. Investment, enhanced productivity growth, wage growth, and rising business and consumer confidence must be part of the picture.

Others have commented on the uncertainty factors associated with Brexit. The outcome of the July 23 Brexit referendum seems to have affected business confidence in the immediate aftermath, but recent soundings suggest that concern among business leaders in my District is modest. In the week following the referendum, we got 244 responses to a survey of CEOs and CFOs, and roughly one-third indicated Brexit had introduced some uncertainty into their individual business outlooks. In a second survey a week later of nearly 400 CEOs and CFOs, the portion of firms reporting Brexit affecting their sales had dropped sharply to only about 15 percent. So I'm satisfied that we've gotten beyond the immediate uncertainty that drove the Committee's caution at the June meeting, and I see the appropriate focus in coming weeks being mostly on domestic economic performance. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Powell.

MR. POWELL. Thank you, Madam Chair. At the time of the June meeting, three factors raised concerns about the economy's underlying momentum. First, economic growth appeared to have downshifted from its long-time post-crisis path of about 2 percent. Second,

payroll growth seemed to be slowing, possibly quite sharply. A third factor was the impending referendum, to use the Kamin-friendly term.

Since the June meeting, incoming data have provided some reassurance on all three fronts. Most forecasts show second-quarter GDP rebounding nicely to the mid-2s, although, at 1.8 percent, our Tealbook forecast is lower than that and at the low end of the estimates. And the BEA, of course, will provide a first official estimate for second-quarter GDP growth later this week. The June payroll report was surprisingly strong, as has been noted. And the referendum vote, while a surprise, seems likely to have little near-term implications for the U.S. outlook.

Turning to economic growth, GDP growth has now been only 1.6 percent over the past four quarters ending in the second quarter, taking the staff forecast for the second quarter. The same figure for the four quarters ending in the second quarter of 2015, as Glenn Follette pointed out yesterday, was 1 full percentage point higher. A good part of that downshift has been in business investment, which goes well beyond the energy sector, for which low oil prices provide a sufficient explanation for the decline. And, of course, a lower path for cap-ex reduces the likelihood that we will see a near-term rebound from the awful productivity growth we have had. It's also a signal perhaps that businesses' expectations for further growth have moved down, as a Tealbook box indicated. And then, echoing what President Lockhart just said, it's hard to see, as a matter of arithmetic, how we get back to sustainable 2 percent GDP growth without higher investment as another engine of demand. Consumption alone is not likely to be a strong enough engine.

The 15 percent or so appreciation of the dollar since mid-2014 has been weighing on demand through net exports, including some that is counted as E&I spending. If the dollar remains broadly stable, that effect should wane over the next year or two. Like many others, I

have thought of the outsized appreciation of the dollar as a tightening in overall financial conditions, which David Wilcox estimated earlier, if I followed him correctly, in the range of 150 to 200 basis points. But 2016 has actually been a time of significant loosening in financial conditions. Since the beginning of the year, the dollar is about flat on a trade-weighted basis, stock prices are up, and the 10-year Treasury is down 70 basis points. And the implied federal funds rate path has flattened significantly. So the tightening cycle that began in December 2015 with a single rate hike has actually so far been a period of significant loosening.

Perhaps others on the Committee are still taking on board the full extent of the decline in the neutral rate of interest. That has certainly been the case for me. In any case, it is notable to me that the apparent weakening in demand and in job growth is happening even as anticipated policy is becoming materially more accommodative. In effect, monetary policy has had to work harder and harder just to sustain a fairly weak economic growth forecast.

To me, this argues for patience and a bit of caution, not panic. Some of the apparent slowdown in demand probably reflects transitory factors or statistical noise. The fundamentals driving household and business spending still seem quite supportive of economic growth, including solid increases in real income, accommodative financial conditions, low gas prices, and healthy levels of business and household confidence. In addition, this easing of financial conditions should add a bit of momentum in the second half. Accordingly, despite the lackluster first-half performance, I still see 2 percent GDP growth or thereabouts for 2016, although I would say there is some modest downside risk to that.

Turning briefly to the labor market, the pace of job growth is far from clear, with 11,000 new payroll jobs in May and 287,000 in June. We're going to need a couple more readings to assess the new trend. It does seem likely that the pace of job gains is slowing, down to an

average rate of about 150,000 in the second quarter. That is enough to drive further declines in unemployment or increases in participation or both, albeit at a slower pace. I don't see this downshift as desirable or necessary to avoid overheating. Desirable or not, though, the downshift has probably arrived, and it is tolerable as long as payrolls are increasing faster than the breakeven rate.

Core PCE inflation was 1.6 percent over the 12 months ending in May, up from 1.3 percent a year earlier, still being held down by the indirect effects of lower oil prices and the stronger dollar. Looking through those transient factors, I see the underlying inflation rate as close to 2 percent, suggesting that inflation should move up to our target as these influences fade. Low inflation expectations remain a concern.

Downside risks to the outlook have diminished, although the risks in the international arena remain substantial. The referendum is probably not an important near-term risk for us, but, as Stan indicated, the coming period of negotiations between the United Kingdom and the European Union could well involve risk-off episodes, and we could feel those here in the United States. In addition, the weaker condition of the European banking system will restrain European economic growth while also creating some tail risk of broader financial turmoil. More generally, European and Japanese authorities have limited remaining scope to address ongoing weakness and any new shocks. And while data regarding China have been positive, the need for its authorities to turn to stimulus measures suggests that the risks are concentrated on the downside there as well.

In sum, I expect both spending and labor market data to remain solid for the next few quarters, with inflation still quiescent. It is to our advantage to see more data to get a better

assessment of the underlying strength of the economy. More on that tomorrow. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Brainard.

MS. BRAINARD. Thank you, Madam Chair. The most noteworthy event of the intermeeting period was the United Kingdom's vote to leave the EU. It's reassuring that financial markets proved resilient in the wake of the vote, although this development increases uncertainty in the global outlook. In parallel, reassuring reports on real activity in the United States, in particular the June reports on employment and retail sales, have reduced concerns about an abrupt slowing in domestic demand growth. Even so, reductions in the pace of job gains and GDP growth over the past few quarters suggest a notable slowing in economic momentum. Let me take each of these developments in turn.

First, recent developments have reduced some near-term uncertainty that weighed on the outlook at our previous meeting. Most importantly, financial markets have appeared resilient in the face of the "leave" vote. After an initial selloff in risky assets U.S. financial conditions appear little changed, on net, apart from a modest increase in the exchange rate. Although the Brexit vote outcome surprised many, it's important to note that policymakers were well aware of the possibility in advance and took precautionary steps. In addition, the market reaction appears to reflect, in part, expectations of additional policy support in Japan, the United Kingdom, and the euro area.

Here at home, we've had some reassuring data on the labor market and aggregate spending. Employment growth bounced back sharply in June after registering essentially no gain in May. The intermeeting data on wages have been consistent with previous signs of a moderate step-up in wage growth. And the labor force participation rate ticked back up last month and

appears to have been about flat over the past two years, consistent with continued moderate cyclical improvement.

Consumption has also proven robust. After weak first-quarter growth, consumption likely increased strongly last quarter and looks to have advanced at close to a 3 percent pace over the first half of the year, a value similar to the average pace over the past two years.

Nonetheless, it's important to note that consumption accounted for virtually all of GDP growth over the past two years and continues to be the main driver of aggregate demand. Buoyant sentiment, further gains in equity and home prices, and continued growth in jobs and wages should continue to provide support.

Nonetheless, we see a notable slowing in economic momentum in other components. Taking the staff's Q2 forecast as given, GDP has risen at an average annual rate of about 1½ percent over the past three quarters compared with growth of 2 percent last year and 2½ percent in the preceding two years. Business investment, as has been noted, has been a particular drag. This likely reflects the earlier depressing effects of a higher dollar and lower oil prices. In the period ahead, it may be that uncertainty associated with the weak global outlook, an election year, and now Brexit, may be restraining investment. Moreover, it appears that the credit cycle may be turning. Data from the SLOOS point to a marked tightening in standards for CRE loans as well as a modest tightening in C&I loan standards.

Residential investment has also slowed as single-family building permits have flattened out. We might expect housing activity to strengthen in coming months as house prices continue to increase, as they did today. Mortgage rates are extremely low, and credit conditions for well-qualified borrowers have eased further, according to the SLOOS, but it's also possible that the sluggish recovery and recent flattening out in residential investment could reflect a lasting

change that will continue to hold the growth in new units below levels suggested by demographics.

Employment growth has also slowed in recent quarters, as has been noted. Monthly payroll gains averaged about 150,000 over the previous quarter, a notable step-down from 200,000 in the first quarter and 230,000 last year, and it appears that this has happened despite the fact that some slack in the labor market remains. The prime-age employment-to-population ratio is still 1¾ percentage points below its pre-crisis level, and the number of workers working part time for economic reasons is still elevated.

More broadly, recent data on price inflation suggest little evidence that resource constraints are starting to bind, and the greater concern may be soft inflation expectations. The most recent 12-month change in core PCE, at 1.6 percent, remains below our target, and core inflation has now been below the target for 88 of the past 92 months. I'm concerned by any signs that inflation expectations will remain soft. Recent changes in survey measures of inflation expectations from Michigan and the New York Federal Reserve were positive, but they still remain below their pre-crisis norms, and inflation compensation remains stubbornly mired at an extremely low level.

Despite the limited near-term fallout from the leave vote, the associated medium-term risks, I think, are still weighed to the downside. It's still too early to know what the macroeconomic reaction to the process of redefining the relationship with the EU will be, but both staff forecasts and the IMF do project a materially slower growth rate in the United Kingdom and somewhat slower growth in the euro area. July's PMI reading for the United Kingdom was consistent with that outcome. Unfortunately, this expected slowing occurs at a time when weak European growth was already a concern, and the ECB is not in a great position

to respond to it. The step-down in demand will pose challenges to European banks, which have struggled with low capital ratios and stagnant earnings, and to the ECB's attainment of its inflation target. Italian banks, as has been noted earlier, are a particular concern, as a decade and a half of poor macroeconomic performance has led to a large rise in nonperforming loans. The combination of EU requirements of private debt bail-ins and a significant and vocal number of retail investors in the Italian bank debt makes the recapitalization process very complicated.

Prior to the leave vote, the ECB was already struggling to meet its inflation target, and the fragile position of European banks appears to be limiting the ECB's policy options by reducing the attractiveness of further reductions in short rates or further flattening of the yield curve. Beyond the immediate hit to economic growth, the leave vote also ushers in a period of uncertainty that could see bouts of financial volatility associated with the negotiations or political events in other European countries.

It's also worth noting that China remains another prominent locus of global downside risks. While the recent data provide reassurance on near-term economic growth and capital outflows, risks over the medium term are likely continuing to build. Much of the near-term boost to the economy appears to have been provided by a large policy-induced jump in debt growth, which is a worrying development in an economy with an uncomfortably high corporate debt-to-GDP ratio. There has also been little coherence in plans to reduce capacity in state-owned enterprises, which is necessary for successful rebalancing. And China's monetary policy and exchange rate framework remain extremely opaque and subject to considerable discretion, with the currency recently depreciating noticeably against both the dollar and the designated basket of currencies despite a stated commitment that targets stability against the basket.

Together, negative surprises in China and Europe pose risks to the United States through weaker demand, heightened volatility, and exchange rate appreciation. And, as was highlighted in two presentations earlier, dollar movements and reactions to surprises have been quite elevated in recent months, and the feed-through to the U.S. outlook has been very material.

Pulling all of these pieces together, I, like Governor Powell, believe that additional data will be very important in assessing how much slack remains and how responsive inflation is likely to be to rising resource utilization as we also assess how resilient our economy is to downside risks beyond our borders. When uncertainty about the cyclical position of the economy is relatively large, as it appears to be at present, the chances of policy settings being either too accommodative or too tight are higher, which puts a high premium on being attentive to the balance of risks. With risks skewed to the downside and with less conventional policy space to deal with adverse shocks than with upside shocks, the costs of adjusting policy in anticipation of favorable data are likely greater than waiting to remove the accommodation until the data provide a higher level of certainty that such a policy adjustment is warranted. Of course, we will return to this topic tomorrow. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President George.

MS. GEORGE. Thank you, Madam Chair. Soft commodity prices have weighed on the 10th District economy, with both employment and wage growth slowing over the past year. In energy-intensive states, the downturn in the energy sector has spread to other segments of the local economy. State budgets are making substantial adjustments in response to falling tax revenue, particularly in states like Wyoming, Oklahoma, and New Mexico. In the ag sector, corn futures prices have fallen sharply, and cattle prices have continued to decline. The persistent downturn in the farm economy has continued to drive demand for agricultural loans, and our

recent Agricultural Finance Databook shows past-due farm loans are starting to trend modestly higher.

Despite these areas of weakness, the District economy overall continues to grow modestly. Layoff announcements have abated. Residential construction activity is picking up outside of energy states, and both our services and manufacturing surveys indicate expanding activity in June.

For the national economy, incoming data since the previous meeting have largely supported my economic outlook. The employment report for June suggested that the soft May number was more noise than signal, and the burst of market uncertainty following the U.K. referendum vote has largely subsided, even with significant questions remaining. In general, I continue to expect moderate economic growth and an inflation rate rising toward 2 percent.

Consumers appear well positioned to continue to move the economy forward. Growth in consumer spending is expected to exceed 4 percent in the second quarter, and consumer confidence readings for current conditions have remained high in July. Continued improvement in the labor market should support the consumer, although I do expect some deceleration in the pace of employment growth that is consistent with an economy at or near full employment.

My staff projects employment growth to average about 150,000 per month for the remainder of the year, well above the pace of labor force growth. This projection is supported by the Federal Reserve Bank of Kansas City's Labor Market Conditions indicator, which shows that although labor market momentum has eased from a high level at the beginning of the year, the current reading remains well above the historical average. While the outlook for consumption remains solid, as others have noted, weakness in business fixed investment persists, and in that regard I appreciated the analysis in the Tealbook box on this topic.

As I look at the categories of equipment investment, two things stand out to me. First are the influences related to the energy and agricultural sectors as well as the headwinds faced by the manufacturing sector that have weighed on equipment investment the past two years. This shows up clearly in falling equipment investment in mining and oil field machinery, agricultural machinery, and railroad equipment. The second factor is the notable slowing in the pace of growth for computer and peripheral equipment. Spending in the remaining equipment categories, however, is increasing at a pace roughly consistent with past expansions. This suggests to me that the softness in equipment investment is not broad based but may instead reflect special factors in those areas.

A weaker path of residential investment is highlighted in the Tealbook's near-term outlook, and although I would agree that growth in this category is likely to decelerate, I would not have categorized the sector as being soft. Residential investment has been the fastest-growing NIPA component since late 2014. Some recent slowing in single-family permitting could well reflect a limited amount of land for new development in desired locations, and steady increases in housing prices suggest demand remains relatively strong. CoreLogic house prices have increased in the past six months at a pace similar to that in 2015. In addition, home renovations have been increasing, which is a category that accounts for a large share of residential investment. Overall, I expect this sector to continue making positive contributions to GDP growth with ongoing home renovations and steady home sales, which support brokers' commissions, another substantial component of residential investment.

Finally, I see inflation as consistent with our statutory goal of price stability. Year-over-year, core PCE inflation has increased to 1.6 percent in May, and the core CPI index has increased 2.3 percent over the past year. In addition, longer-term expectations look consistent

with our goal. I took note of the special question in the recent Survey of Professional Forecasters, which asked, “Is your long-run forecast of PCE inflation different from 2 percent by an amount you consider economically meaningful?” And its follow-up was, if so, explain why. Responses indicate that 24 of 32 forecasters have a long-run inflation forecast in the vicinity of 2 percent. The 8 forecasters who submitted long-run expectations meaningfully different from 2 percent all had expectations above it and not below. And 6 of those 8 pointed to monetary policy as the reason for their above-target long-run inflation forecast. I also found the recent release of the New York Fed’s Survey of Consumer Expectations reassuring, as the median inflation expectations at the three-year-ahead horizon increased from 2.7 percent in May to 2.9 percent in June. Thank you.

CHAIR YELLEN. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Madam Chair. This year has been a challenging one for the 11th District primarily because of weak oil prices, particularly in the first quarter, as well as a strong dollar. Job growth during the first quarter was revised down by the Texas Workforce Commission, which now estimates that it was negative 1.3 percent, annualized. Consistent with that, we have changed our overall forecast for 2016 job growth for Texas to just ½ percent versus 1.3 percent last year and 3.7 percent in 2014.

Our most recent Texas outlook surveys show some stability in the manufacturing sector after several months of declines and continued growth in the services sector. Home sales and prices continue to firm for most major Texas metro areas except Houston. Texas exports through May year-to-date are down approximately 4 percent, year over year. This is primarily due to, again, the strong dollar and weak global growth outlook. We think our exports will remain weak for the remainder of 2016, which is very significant for Texas. We are a large exporter; exports

are about 16 percent of the state's GDP, so the weakness is a significant drag. Contacts report little evidence of wage pressure, at least in our District, other than, as we've said before, in skilled trades, high-tech manufacturing, legal services, construction trades, IT, and so on.

In the energy sector, with substantial cuts to rig count and capital spending over the past two years, U.S. oil production is estimated at approximately 8½ million barrels per day in the month of July. This is down approximately 10 percent from a year earlier. Despite that decline, global oil production actually is going to be modestly higher for 2016, because OPEC production is expected to rise due, importantly, to increases in production in Iran and Iraq. So 2016 will be up over 2015, but the rate of increase has slowed.

We continue to expect global supply and demand to move into rough balance during the first half of 2017, on the basis of our expectation of increasing demand of approximately 1.3 million barrels a day, on average, in 2016. It's been our view that the recent uptick in prices may have been overdone because of temporary production outages in Nigeria and Canada. Those outages have now been substantially restored, so we're not surprised by the recent reduction in oil prices. However, on the basis of the expected trend toward balance in terms of global supply and demand, we do continue to expect oil prices to firm as we head into year-end and into next year. With this firming, we've now been seeing in the past few months, for the first time in 18 months, some very modest oil rig count increases. This activity is primarily in the Permian Basin, in which breakeven costs are the most attractive.

We still expect, though, that rig increases will be very limited over the next several months because, on the basis of our discussions with our contacts and our new energy survey, we continue to think that breakeven prices for new drilling still range between \$50 to \$60 per barrel in the most attractive fields in the Permian and higher in other fields. So we still are not yet at a

market price that allows people to drill and make a profit. As a result of this and the fact that many industry participants are highly leveraged, we continue to expect to see more mergers, bankruptcies, and restructurings in this industry for the remainder of the year. And, in the service sector, we wouldn't be surprised to continue to see more job losses.

For the next few years, because of very high levels of capacity utilization in OPEC, the U.S. shale industry is likely to provide the short-cycle supply increases needed to meet growing global demand, mainly because, as we've said before, long-lived project investments have been relatively dormant for the past two, two and a half years. So we're more optimistic that we will have some tailwind as we head into 2017 and beyond.

Turning to the national forecast, we do believe we're making progress toward reaching our dual-mandate objectives. Labor market slack has continued to be reduced, and we believe we are making gradual progress toward meeting our inflation objective. The Federal Reserve Bank of Dallas trimmed mean 12-month reading is holding steady at 1.8 percent versus approximately 1.65 percent a year ago, which to us is consistent with gradual, although modest, increases in core inflation.

We believe the recent deceleration in the pace of job growth is consistent with a labor market approaching full employment. So we see the average of 150,000 per month that we've experienced the past few months as not surprising and still, as has been said, consistent with continuing reductions to the unemployment rate. Our own forecast is that the unemployment rate is going to reach approximately 4.6 percent by the second quarter of 2017.

We continue to estimate 2016 real GDP growth in the United States at approximately 2 percent. For us, the risk in our forecast is actually modestly to the upside. Although Brexit may have muddied the waters for the United Kingdom and the euro area, and it will take time to

assess the ultimate effects, our working assumption is that the effect on the United States is going to be very limited. Discussions we had with our industry contacts in the United States suggest that the consumer is solid and stable—not better than that, but certainly solid and stable. We note, by the way, that despite Brexit, junk-bond spreads have narrowed in the intermeeting period, and, in fact, real household wealth likely turned up in the second quarter, all things netted out.

As has been mentioned, we keep a close eye on and do our own models of the neutral rate. We note that slower five-year economic growth expectations as well as growing demand for safe assets around the world are drivers of recent declines in world interest rates, which are consistent with declines in our internal estimates of the real neutral rate. As a result, we believe that the FOMC is less accommodative, even at 25 to 50 basis points than is widely believed.

I'd like to make one more comment on business investment. On the basis of extensive discussions with our contacts, we assess that while people are pleased with their debt borrowing costs—and, if they are public companies, with their stock prices—most business leaders we speak to fear that we are in for a prolonged period of sluggish GDP growth both in the United States and across advanced economies. In addition, they see, as I've said before, very high levels of disruption in their respective industries—either new entrants that are threatening their model or, at a minimum, consumers having greater leverage that is limiting their pricing power and lowering margins. The result of this is that CEOs are very hesitant to make major additions to capital spending plans or capacity additions until they see some greater clarity regarding their future growth prospects. And, we are finding this pretty broadly across contacts in our District. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Harker.

MR. HARKER. Thank you, Madam Chair. Overall economic activity in the Third District is little changed from June. But looking ahead, things appear to be on the upswing. Employment growth has slowed a bit, and the unemployment rate ticked up to 5.3 percent in May. Comparing labor force developments in my region with those of the nation, the Third District continues to grow a bit more slowly than the nation, but that's not unusual. We typically do.

The manufacturing sector continues to struggle a bit, but expectations in the business community remain fairly upbeat: Of the firms surveyed in our latest Business Outlook Survey, 46 percent expect an increase in activity over the next six months, while only 12 percent anticipate a decline. Also, a large majority of firms reported stable employment in July. Now, a contact with broad exposure in manufacturing indicated that a number of lines of business are beginning to see profits turn positive, with July being the best month of his year. Growth is strong in transportation, health care, and areas associated with construction. And he reports there have been no negative effects from “the Kamin,” we'll call it, as he walks out of the room [laughter], formerly known as “the Brexit.” Even in his businesses that deal heavily with Europe, he's not seeing any real effect. Another contact indicated that the British arm of a major flooring company is reporting stronger growth as a result of the Brexit vote. However, one of our bankers indicated that a major multinational firm in our District is starting to lay people off, and the excuse it gave was that, because of the Brexit result, it started to see some slowdown in its business. Who knows whether that is true, but that's what it is reporting.

Bankers in our region are experiencing strong loan growth and high profitability as well as a continued decline in delinquencies. Residential investment is strong in the Philadelphia area, and the Jersey Shore is absolutely booming. Although these numbers will not excite

President Williams, beachfront property on Long Beach Island, New Jersey, is going for upward of \$4 million to \$5 million. I know, that's a condo in San Francisco.

MR. WILLIAMS. A lean-to. [Laughter]

MR. HARKER. A supplier of homebuilding materials has seen a 60 percent increase in business during the second quarter. And, as others have reported, for difficult-to-find workers such as truck drivers, this one contact says his firm has raised wages three times this year alone to try to find truck drivers. That said, a number of contacts did mention that the uncertainty arising from this year's presidential election was damping their capital spending for the second half of this year and possibly into 2017.

Nonmanufacturing activity in the District continues to grow modestly at a somewhat slower-than-historical rate. Readings are a bit mixed, as we are seeing declining activities at malls but very strong growth in tourism and hospitality. The DNC helped that, by the way, this week. Like our manufacturers, area service providers remain relatively optimistic with respect to future activity. Further, commercial construction has begun to pick up in the region, which makes us an outlier nationally. Also, the value of residential contracts continues on a steady upward trend, although permits continue to fall, mostly as a result of weakness in the multifamily sector of the market. House prices are appreciating at a modest pace, growing at less than half the U.S. average. So, overall, the Third District should see steady, if unspectacular, economic growth, and contacts are generally upbeat about the future.

Turning to the nation as a whole, the latest employment report greatly allayed my concerns over the underlying strength in the labor market. Averaging through the past few months indicates that job growth has decelerated from earlier in the year, but that the economy is still creating jobs at a healthy clip. In light of the tightness in the labor market, I also believe that

a gradual slowdown in job creation is, as many have said, to be expected. My other concern over the potential destabilizing influence of Brexit, as others have noted, has not materialized. If anything, financial markets have shown amazing resiliency, and it is still not clear if and when actual Brexit will occur.

Overall, I view the data we have received since we last met as reassuring. Consumer spending and residential real estate are contributing to economic growth, the job market has retained its dynamism, and core inflation numbers appear to be heading toward our target. I anticipate that headline inflation will follow and that the economy will grow at or slightly above trend. In that regard, I'm a bit more optimistic than the staff in the Tealbook. Now, some of my optimism is informed by my greater reliance on GDPplus rather than expenditure GDP, or simply GDP, as a measure of underlying economic activity. This latent variable is calculated by the staff at the Philadelphia Fed and combines GDP and GDI using a Kalman filter. Interestingly, the staff finds that GDPplus does not suffer from the residual seasonality problem and is a better predictor of GDP than GDP itself. Further, real-time forecasts of GDPplus are more informative about future GDP than our current real-time estimates of GDP itself. This suggests that current GDPplus contains valuable information about underlying economic activity as well as about future revised BEA estimates of GDP. The current estimate we have for first-quarter GDPplus growth is 2.7 percent, and this measure indicates that there was no fourth-quarter economic slowdown. Also, using GDPplus as a gauge of first-quarter economic activity substantially attenuates the puzzling weakness in labor productivity. My somewhat optimistic outlook will inform my view on policy tomorrow. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Let me suggest at this point, for good behavior, we take a short break—maybe 20 minutes. I think coffee and refreshments are available outside.

[Coffee break]

CHAIR YELLEN. Okay, let's get started. Our next speaker is Governor Tarullo.

MR. TARULLO. Thank you, Madam Chair. As everybody has pointed out, the significant short-term downside risks that loomed over the June meeting have largely dissipated, although I don't think that means that we've reverted to the situation we were in, say, in mid-May. I think Jay did a very nice job of identifying several of the reasons why that's the case. First, there's been a slowing in the job creation numbers. I don't know why we think that necessarily we've slowed and now plateaued at 150,000. It seems to me there's at least an open question as to whether that trend line will continue to be down or whether it will plateau at 150,000. Second, while longer-term Treasury securities have retraced some of the decline in the immediate aftermath of Brexit, they didn't get all the way back. This may be due, at least in part—as I think people have already suggested—to changes in the expected path of monetary policy both here and abroad, which is in turn associated with somewhat less-sanguine expectations for economic growth. Those anticipated changes probably have also contributed to the rebound in asset prices. And third, Governor Powell mentioned Brexit, but I want to invoke David Wilcox's formulation here, which seems to me the right way to look at it. Back in June we regarded Brexit, depending on the individual, as a somewhat unlikely outcome, but that if there was such an outcome, bad things could happen from it. We were implicitly putting a discount factor on the likelihood that there would be Brexit. But now Brexit is probably a reality, and so those potential bad things coming out of Brexit now have to be evaluated as real risks rather than one of the different layers of contingencies. We don't know what the magnitude of the negative effects will be, but I think it's hard to argue that the sign is going to be anything but negative.

With the dissipation of the immediate downside risks, I thought it was a good moment to reflect on the risks associated with the policy approach that I personally have been taking. This is on the theme of having an open mind. Obviously, none of us, I hope, has an entirely open mind, meaning no priors, no ways of looking at things. But I think that we all have to be careful not to fall into defending positions that we've taken, like a debater or a litigator, using whatever evidence is available to defend that position—as if you're just trying to get a particular outcome for a client or in front of bunch of judges in a debating tournament—and to think more about being a policymaker who is trying to absorb changes and, thus, change one's own position. And, in all honesty, I actually think the Committee structure we've got makes it harder to do that because it pushes us a little bit into staking out positions that we then defend. So I thought I would try, with myself, to think through what the risks may be to the approach that I've been taking when thinking about monetary policy decisions. It won't be surprising to anticipate the conclusion that I don't currently find those risks significant—and I'll explain why in a minute—but at least it helped me think about what things might change that should, in turn, force me to change the position I've been taking on monetary policy. And, thus, it was a useful exercise. Plus, by explaining it, it gives people an opportunity to explain why they think the risks are actually somewhat greater.

To recapitulate what I've said before, my basic approach is that I would prefer to wait for more convincing evidence that inflation will get to, and then remain around, the 2 percent target before we raise rates further. Basically, I have three reasons for taking this approach. First, so long as the price-stability side of the dual mandate is not in danger of being breached on the upside, it's important to take to heart the statutory injunction that we seek maximum employment, not some sort of constructed view of full employment. Second, due to the

asymmetry of the policy tools currently available to us for tightening and for loosening, we should err on the side of an accommodative policy to avoid increasing—even if only incrementally—the vulnerability of the economy to some shock, anticipated or unanticipated, that would be effected by an additional rate increase. And, third, in light of recent experience of persistently below-target inflation and the possibility that secular forces will make it more difficult to reach and maintain inflation of around 2 percent, it seems reasonable to wait for clearer evidence that the target will be reached. So at least the first and second of these reasons rest on the expectation that we'll have ample time to react if and as inflation were to move upward in a way that threatened the target on the upside. I want to focus in particular on the risk that this expectation may prove to be ill founded.

But, first, I wanted to address financial-stability risks briefly. As I made clear in our previous discussions, I'm not opposed in principle to the notion that, in some relatively unusual circumstances, short-term rates may need to be raised in order to diminish risks to financial stability that may be associated with a broad range of asset prices moving well above historical averages due to increasing amounts of leverage. And, as I noted earlier, I hope that in thinking through possible longer-range frameworks for monetary policy, we will at least explore the development of other financial stability tools. For the present, though, a rate increase is the most obvious such tool that can be used among monetary policy tools to try to stave off adverse financial stability effects.

I agree that the conditions in which one would worry about financial stability are more likely to develop in an environment in which interest rates have remained very low for a long time. But even if these conditions were to occur, one would want to do a careful assessment of the relative risk to the economy of tightening versus the risk to the economy stemming from a

painful and possibly rapid deleveraging if prices and leverage continue to rise well above sustainable levels. And, more to the immediate point, I don't think the conditions that I hypothesized a moment ago are with us today. It is true that CRE markets in six or seven so-called gateway cities do present grounds for concern. It's also true that the inventory of leveraged loans held by a variety of financial intermediaries may yet return significant losses and have some negative macroeconomic effects. And one might argue the case that equity markets are overvalued. But I think it's very hard to make a case, looking at the economy as a whole, that we have a wide range of unusually high asset prices supported by large amounts of leverage, which would present an appropriate case for a monetary policy rate increase as opposed to either supervisory actions, regulatory actions, seeing if markets calm down, and engaging in that risk-reward assessment I suggested a moment ago. Moreover, the greatest risks that may be present are more weighted in smaller banks and nonbank intermediaries rather than in the large banks, whose strength or weakness is still an important determinant of the overall stability of the financial system as a whole. So, again, I agree with the proposition that we ought to keep financial stability considerations in front of us, but I also agree with those who have said the threshold should be pretty high for a policy rate increase. And I think one would need to see a much broader range of asset price concerns than those in a couple of discrete areas.

Turning now to inflation, for the purposes of my remarks today I don't want to focus on the likelihood that, in the absence of interest rate increases, core PCE inflation does get back to and stay around 2 percent. As I noted earlier, that's an important question, and no matter where we began, I think we're all having to give a little bit more credence to secular stagnation arguments than maybe we did 6 or 12 or 18 months ago. But whatever answer you give to that question really doesn't implicate the riskiness of the overall approach to monetary policy I

suggested a moment ago. A steady and apparently sustainable move of inflation upward would allow even the most patient of us time to react. And because it seems unlikely that r^* is very large right now, we wouldn't have to go very far before reaching a neutral or even a contractionary rate.

The risk that's most salient to the monetary policy approach that I've been taking is that inflation would start moving up sufficiently rapidly as to put the Committee "behind the curve." And, as I understand the position of some on the Committee, the real fear is that it would force us to raise rates so sharply as to induce a recession. The scenario that seems to lie behind that fear is that we undershoot the natural rate by so much that inflation either jumps well above 2 percent fairly quickly or that it's put on a trajectory in that direction. In either case, the concern is that significant, fairly rapid increases in rates would be necessary to bring it back down to 2 percent. Now, I'd note in passing, I think this scenario must also embed a hypothesis that inflation expectations either don't play the role that the majority of this Committee has assigned them or that those expectations become unanchored to the upside very quickly, despite the fact that recent experience suggests that the risk of expectations becoming unanchored have been toward the downside.

One of the reasons I've resisted the policy implications of this scenario, at least at the present time, is that I think the natural rate may be lower than estimated by the staff, in which case even if the dynamic of the scenario has validity, it wouldn't kick in until unemployment was lower than would be suggested under current assumptions. This gets us back to the question of how much slack remains in the labor market, how much trend labor force participation is sensitive to overall luck, labor market conditions, and related issues. I suspect that differences in views among the Committee on these matters will persist, based probably on everybody's own

priors, well beyond the time that we have to act or not act. So I'm not sure that that's going to be a convincing argument one way or the other.

A second reason I haven't found this scenario compelling is that for it to play out, the Phillips curve would not only have to be somewhat steeper than the slope it has maintained for the past 20 or so years, but it would also probably have to be notably nonlinear so that the move through full employment resulted in a fairly quick, fairly sizable increase in price inflation. While this is, of course, possible, and there is at least some empirical work suggesting the possibility of nonlinearity of the Phillips curve in some circumstances, there don't seem to be compelling reasons to believe that it would suddenly and significantly steepen in the circumstances of an economy running, at most, moderately above trend and with the increasing evidence that the flat slope of the Phillips curve has been persistent across time in the United States and has been similarly flat in most of the world's major economies.

Third, I am not sure that there really are a lot of precedents for the negative scenario that people have in mind in wanting to raise rates, if I can put it this way, a little bit preemptively, although I know that's not the way people would put it themselves. First off, the problems of the 1960s and 1970s—which almost present the classic case of the FOMC slamming on the brakes and not being able to engineer a soft landing but, instead, inducing a recession—didn't just spring up overnight. They were years in the making. For the more recent experiences, in the 2000s, although the Federal Reserve may bear some of the blame for the financial crisis and the Great Recession, I don't think you can make the case that the financial crisis and the Great Recession were catalyzed by FOMC funds rate increases because of waiting around too long to act. There are obviously, as President Lacker would suggest, debates we should have, and we can all have debates, but I think it's hard to make that case. It was surely not the classic kind of

central bank-induced recession. I also think the recession of the early 2000s is a murkier picture. First, it was a very mild recession. Second, I think you can make a pretty good case that it was a byproduct of the bursting of the tech bubble, which may have had something to do with preexisting monetary policy, I would acknowledge. But, again, it doesn't present that classic case. So I think those precedents are limited in their applicability to where we are now.

Finally, as I noted in the previous meeting, the unemployment rate has been more or less steady for nearly a year now, during which time the economy has continued to create jobs well above even a generous estimate of the number of new entrants in the labor force. So, stipulating for a moment that we should act before we undershoot by too much the natural rate—which, again, for purposes of argument, I'll stipulate is at about the current level—right now we're clearly not racing past the natural rate. If the unemployment rate were to begin moving down again in a nontransitory fashion, the reasoning that lies behind this scenario would, at least in my judgment, be stronger whether or not I became completely convinced after taking account of the Phillips curve and some of the other factors that I mentioned a moment ago.

In conclusion, I don't want to suggest, now or at any time, that there's no risk in the monetary policy approach that I've been taking. Indeed, anyone who thinks his or her policy preference carries no risks or costs is almost surely wrong. And, in the current circumstances, I think it's particularly incumbent on those of us subscribing to a more patient approach to continue to evaluate how changing conditions might increase those risks and, thus, might affect the calculus of when the right time for another rate increase has come about. For the moment, though, it seems to me, at least, that the risk of a rapid, significant undershoot of the natural rate taking place before we can react and leading to nontransitory, above-target inflation seems quite

modest. And financial stability vulnerabilities also seem to me well short of the kind of pervasiveness that would warrant a monetary policy action.

I have a feeling there's not going to be too much doubt about what I'll say about my preferred monetary policy stance tomorrow, but I will leave that until tomorrow, Madam Chair. Thank you.

CHAIR YELLEN. Thank you. President Mester.

MS. MESTER. Thank you, Madam Chair. You may have heard a loud cacophony coming from the Cleveland District in the intermeeting period. [Laughter] It was actually a big sigh of relief. The Cavaliers finally won the NBA championship, Cleveland's first national sports championship in 52 years; national employment rebounded strongly in June; financial markets calmed down fairly quickly after the vote of the U.K. referendum; and the political conventioners finally got out of Dodge.

Overall, economic conditions in the Fourth District have changed little during this intermeeting period, save for indications of building price pressures. The Bank's diffusion index of business contacts reporting better versus worse conditions rose from plus 9 at the time of our previous meeting to plus 18, a reading consistent with the moderate pace of economic growth we've been seeing. In a special staff survey, the vast majority of District contacts reported that they don't expect any consequential effect on their firms from the United Kingdom's vote to leave the European Union, and even among exporters, fewer than 20 percent expect any effect.

Labor markets in the District remain healthy, with further signs of tightening. Firms increasing employment outnumber those reducing it, and the Cleveland Federal Reserve staff estimates that year-over-year growth in payrolls remained at 1.2 percent in June, the same as in April. The District's unemployment rate has remained low and stable, estimated at 5.1 percent in

June. Nearly all District contacts reported some upward pressure on wages. Notably, this was reported even in some sectors, like manufacturing, in which job growth has not been particularly strong. Higher wages are increasingly being reported for entry-level positions.

The Cleveland staff's diffusion index for prices received had been gradually moving up since the beginning of the year, but it more than doubled over this intermeeting period to its highest reading in two years, since the start of the survey. In the survey, 43 percent of respondents across a set of industries that includes construction, retail, and energy reported increasing prices, all at least modestly.

Turning to the national economy, my outlook for the U.S. economy over the medium run is little changed since our previous meeting. Once again, the resiliency of the U.S. economy stands out for me. At the time of our previous meeting, the upcoming vote on the U.K. referendum loomed large, and we had a very weak May employment report in hand. The outcome of the U.K. vote was a surprise and generated considerable volatility in financial markets. Since the vote, financial markets have calmed, and financial conditions are now more accommodative than they were at the time of our June meeting. Of course, we will be living with heightened political and economic uncertainty for a while as the United Kingdom and Europe establish the terms of their new relationship, but it's gratifying to see that the worst-case scenarios that had been contemplated have, so far, been avoided.

The jobs report showed a sizable rebound for May, which was even more disappointing than originally estimated. The rebound allayed concerns among some that we were at the start of a reversal of the considerable progress that has been made in labor markets, and it was another reminder that monthly data can be volatile. I'm not saying we should ignore the monthly reports, only that we need to be somewhat careful not to read too much into any one report, and we have

to assess conditions on the basis of a broad set of indicators. For labor markets, those include claims for unemployment insurance and the unemployment rate, which are low, and the rates of job openings, hiring, and quits, which are high.

Averaging through the past three months, as many people have indicated, monthly payroll gains have averaged 147,000 per month. This is a deceleration from the 200,000 monthly average seen in the first quarter, but it's above current estimates of the pace of job growth consistent with stable labor utilization. The Tealbook estimates this to be roughly 85,000 jobs per month. Across several models that take into account the aging of the population and other demographic factors affecting labor force participation, the estimates range from about 75,000 to 120,000 per month, with the most recent estimates in the lower part of or even below that range. For example, in the Cleveland staff model, the estimated trend pace of job gains is about 120,000 per month. The CBO currently estimates average monthly payroll growth of 75,000 over 2021 to 2026. Some relatively recent research done by Cleveland Federal Reserve economists puts it between 50,000 and 85,000, and a more recent study by Chicago Federal Reserve economists estimates trend monthly payroll employment growth to be about 50,000 now and rising to about 70,000 by 2020.

In any case, the current pace of job growth, though slower than earlier in the year, is sufficient to generate further increases in labor utilization, provided labor force participation behaves roughly as anticipated. I think this is a point worth emphasizing. We'll have two employment reports before our next meeting. It seems fairly likely that the next report won't match June's outsized increase of 287,000 jobs. It could be quite a bit lower and below analysts' estimates. This poses a communications issue for us. Without the context, the headlines could

be quite negative when in fact the pace is consistent with further improvement in the labor market.

Current estimates indicate a rebound in GDP growth in the second quarter, back to a pace at or slightly above trend, with consumers leading the way but business investment remaining weak. The increase in oil prices has started to bring some investment activity in the energy sector back online. However, the slowdown in investment has been broader, and it does pose a risk to longer-run potential economic growth.

Like President Williams and President Lacker, I noticed that the Board staff had made a fairly large downward revision to their forecast of residential investment growth for this year. In contrast, I haven't revised my outlook for the housing sector since the previous meeting. I continue to expect moderate growth in residential investment. This is consistent with other private-sector forecasters. Single-family building permits rose in June and are moderately higher than a year ago. Sales of both new and existing homes have been moving higher, and we've been receiving positive reports on current and future housing activity from a District contact who is a large provider of coating materials to the national housing market. Mortgage rates are expected to remain low. The most recent Senior Loan Officer Opinion Survey indicated a pickup in mortgage loan demand. And while residential real estate lending standards remain tight, standards for GSE-eligible loans are easier than they've been, on average, since 2005. In addition, the Board staff estimates the annual NIPA revisions will show a higher level of residential investment last year than originally estimated. Perhaps this will result in a higher growth rate for last year, too, offsetting a slower rate this year.

I view the inflation outlook as largely unchanged since our previous meeting and consistent with inflation gradually rising back to our 2 percent goal over time, with some ups and

downs along that path. This seems like a reasonable forecast, reflecting my expectation that economic growth will continue to be at or slightly above trend, that the unemployment rate will fall below estimates of this longer-run trend, and that inflation expectations have been and will continue to be reasonably stable. I note that the troubling dip in inflation expectations seen in the preliminary June Michigan survey was revised away in the final numbers. We might see headline inflation move down in the immediate term, due to the drop in food prices and residual seasonality, but a gradual upward climb back to our goal seems reasonable to me, conditional on the outlook. When you look at the trajectory of inflation over the past year, you see that we have indeed made progress as the earlier declines in energy prices and the effects of the sharp dollar appreciation have been passing through. Both headline and core measures of inflation have gradually moved up since last fall. I think we should take some comfort in that trajectory.

In thinking about appropriate monetary policy, I'm guided by the medium-run outlook and risks associated with that, as well as the progress we have made and future progress we anticipate making on our two monetary policy goals. I think we're basically at our goal of maximum employment from the standpoint of what we can do with monetary policy. And even if there's some uncertainty associated with that, I think it's pretty clear that we're close to that goal. Inflation remains below our goal, but here, too, we've been moving in the right direction. Forecasts, including the Tealbook and the Cleveland Federal Reserve staff model, show the unemployment rate moving down and inflation moving up, even as the federal funds rate rises gradually over the forecast horizon.

While there are downside risks to the forecast, those have subsided somewhat since our previous meeting. The worst-case scenarios after the U.K. referendum were not realized, and fears about employment were allayed after the June report. There are also upside risks to the

forecast. I found the alternative scenario “Weaker Productivity with Higher Inflation” a good illustration of the type of upside risk we should not ignore. In this simulation, the policy rate path needs to be considerably steeper than the one we are anticipating. In addition longer-term yields on Treasuries are down since the start of the year, but the Board staff estimates about two-thirds of the decline reflects lower term premiums, while one-third represents lower average expected future short rates. The lower term premiums represent an easing in financial conditions that should be supportive of economic activity and, if sustained, is an upside risk to the forecast.

That said, I don’t believe we are “behind the curve” yet with respect to monetary policy. In my view, the gradual upward path of policy, as indicated in our FOMC communications and in the June SEPs, continues to be appropriate. No one’s talking about the need to sharply raise interest rates. What’s left to talk about is timing. It reminds me of that old joke that ends: “We’ve established what you are, Madam, now it’s just a matter of haggling over the price.”

So if we continue to communicate that a gradual upward path is appropriate, then at some point we will need to take another step on the path. Of course, if we no longer think such a path is appropriate, then it’s incumbent on us to say that.

Now, it could very well be that we are in a new economic environment with low equilibrium real rates that will last for a long time, meaning that the same level of the funds rate is less accommodative than in the past. And the policy trajectory may need to be even more shallow than we think. But the anticipated gradual policy rate path takes this possibility into account and allows for recalibration along the way. It recognizes that there are large error bands around the SEP forecasts regarding the economy and the policy rate path, even if we, as a Committee, can’t agree to show those confidence bands to the public. But even if r^* is low, it

isn't a situation that supports maintaining the funds rate at 25 to 50 basis points indefinitely, even as we continue to make progress on our goals.

I continue to believe monetary policy should be forward looking. Trying to purposely drive the economy to overheat in an attempt to generate a faster return to 2 percent inflation and a cyclical rebound in labor force participation seems ill advised and risky. I can't point to any historical examples of central banks pursuing this strategy that have ended well. I think it overestimates our ability to control things, and it seems inconsistent with a gradual policy rate path. It seems more likely that it would require an *L*-shaped path, low for long and then steeper thereafter. So I really couldn't support pursuing that strategy.

At some point, conditional on the outlook and associated risks, we will need to raise the funds rate. And then, consistent with the gradual path, we can take some time to assess the situation. The gradual path doesn't anticipate increases at each FOMC meeting. Indeed, I recall we settled on the language of "gradual path" to dissuade the public from thinking that once we started, we expected to move at every meeting. If the medium-run outlook changes significantly, then we can hold rates there for a while or even reverse course. I wouldn't view that as an error, just as I don't view December's increase as an error, even though we haven't raised the rate since then. The exact timing and ultimate policy rate path are data dependent, meaning they depend on how economic conditions, the outlook, and the risks to the outlook are evolving. This is the nature of policymaking when the future is uncertain. But that's nothing new—the future is always uncertain. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Evans.

MR. EVANS. Thank you, Madam Chair. On balance, the reports from my directors and other business contacts were somewhat more upbeat this round. The commentary still seemed in

line with the roughly 2 percent economic growth we've seen for some time. But whereas my contacts before were only hopeful that they would achieve their 2016 business plans, now they have more confidence that they will actually meet these goals. Among the positive reports this round, my director who heads Motorola Solutions reported an increase in his order backlog and a better outlook from a variety of customers. Regarding President Williams's comments on housing, several other directors pointed to improved residential construction, with one noting a change in the composition of activity from multifamily to single-family units. My director from Commonwealth Edison reported stronger usage across its customer base and noted that it was hiring to meet increased demand for new connections, and residential is a large part of that. More generally, my contact at Manpower Employment Services described increasing labor demand and a modest pickup in nominal wage growth, consistent with a tightening labor market. He noted that the pickup in wages extended beyond just high-skilled workers. Firms in the services sector have been doing quite well, which is bolstering demand for lower-skilled and entry-level workers as well. None of my contacts expressed serious concerns about Brexit, although some said it was too early to tell.

To be sure, not all reports were positive. In particular, most manufacturing firms are still struggling, and I found President Lacker's positive comments from the Machine Technology Association to be very interesting. I look forward to learning more about that. Caterpillar and Deere continue to note challenges. Business lines related to natural resource extraction and construction remain soft. It was also noted that their earlier projections for increases in state and local government infrastructure spending had been slower to materialize than expected. Other manufacturers had similar stories.

Turning to my macroeconomic outlook, our GDP forecast is a tad stronger than the Tealbook's. We see GDP growth at about 2 percent this year and then a bit stronger in 2017. Another difference is that we currently think that there's a little more slack in labor markets than indicated in the Tealbook. Still, under our forecast, slack is essentially gone by early next year.

The June labor market report and incoming consumer spending data increased our confidence in this outlook. We also see somewhat stronger investment growth than the Tealbook, although it's not gangbusters. This, in part, reflects analysis of a new data source by my staff. We've obtained data from a local firm, Textura, that processes commercial construction contract payments and budgets. This is one of those new high technologies being brought to bear on business procedure today. It basically is working with an old construction payments mechanism in which people put liens on the building every time they finish part of it, then get paid and take the lien back, and then put another lien on so that somebody won't fail to pay you when you've done something for them. They now do this digitally and as a clearinghouse for people, and that's basically the value proposition. The contracts represent about 4 percent of total U.S. construction spending, but have a national reach. Our experimental indicator, on the basis of the budgeting data, appears to provide a six-month lead for predicting total U.S. construction spending. Right now, on the basis of the data we have, it is pointing to a modest pickup in construction spending in the second half of the year.

While I'm feeling somewhat better about my projection of economic growth, I still see the balance of risks as weighted somewhat to the downside, and I remain concerned that the international situation could deteriorate with attendant movements in the dollar and financial conditions weighing on spending. I thought Governor Brainard covered that territory extremely

well. Also, if, for some reason, the U.S. consumer were to falter, I don't see the other components of domestic demand picking up the slack.

Turning to inflation, my outlook, again, is close to the Tealbook. I'm projecting 2016 core inflation to be 1.6 percent. Further ahead, I see both core and total inflation moving up gradually but still falling a bit short of our 2 percent target at the end of 2018. Furthermore, as I discussed at our previous meeting, I see meaningful downside risks to this forecast. Most important, inflation compensation in financial markets and survey measures of inflation expectations continue to bounce along at extremely low levels, and my business contacts still report no significant inflationary pressures or pricing power to pass along any cost pressures they actually do face. If we were really going to see a quick return to 2 percent core inflation, I would expect to see something more bubbling up with these indicators. I hope that these will turn around as we move through the year, but I remain skeptical. And I agree with Governor Tarullo's risk-management assessment regarding upward inflation realizations relative to our expectations as well as the financial stability risk responses. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Bullard.

MR. BULLARD. Thank you, Madam Chair. At the June FOMC meeting, I discussed the St. Louis Fed's new approach to the macroeconomic outlook. In my remarks today, I plan to compare that outlook with the July Tealbook to try to better illustrate what the differences may be.

As you may recall, the Federal Reserve Bank of St. Louis' new approach is based on a regime conceptualization that does not rely on convergence properties of an economy returning to a long-run steady state. There are three parts to the current regime, as we view it: number one, low productivity growth; number two, a very low real return on short-term government

debt, which we labeled r^* ; and, three, no recession. To see r^* , the staff has kindly provided in Michael Kiley's report, exhibit 2, chart 4, the expected real equity return. This shows the staff's estimate of the expected 10-year real equity return as well as the expected real yield on the 10-year Treasury, with a substantial difference between the two. The expected real return on the Treasury is negative, as it has been for the past several years on and off. What we're talking about is short-term debt, so this would be even lower than the red line in this figure. That's a big part of our regime. Also, very helpfully, this picture shows the long-term decline in the red line from the 1980s. Because this thing's been declining secularly for a long time, we see no reason to predict that this is going to suddenly turn up and go to a higher value. Or, if you want to look at related evidence, I think it would give you the same story here.

As of today, we see no evidence that we have or are likely to switch out of any of the three elements of the current regime. Real returns to government debt remain exceptionally low, productivity growth remains exceptionally low, and recession probabilities are low as well. We therefore think the most appropriate forecast, as most cyclical adjustment is likely over, is that the U.S. economy will remain in the current regime for the foreseeable future. Anecdotal evidence from around the Eighth District seems to corroborate this judgment. Accordingly, we continue to forecast real GDP growth of 2 percent for 2016, 2017, and 2018; fourth-quarter average unemployment of 4.7 percent for all three years; and trimmed mean inflation of 2 percent for all three years.

Given the regime, the appropriate policy rate supporting this outcome is just 63 basis points over the forecast horizon. Essentially, because there's no concept of a long-run steady state, there's no requirement that the policy rate begin a long march back to its longer-run average level. This is true so long as the current regime remains the best description of the

macroeconomic environment. The July Tealbook, in contrast, has 1.7 percent real GDP growth for 2016, somewhat lower than us, accelerating to 2½ percent for 2017. Faster growth is just around the corner. But if you average these two figures, you will get 2.1 percent, approximately the same as the St. Louis forecast with a bit of difference in timing. Unemployment falls, according to the Tealbook, but only to 4.6 percent at the end of 2017, almost the same as the St. Louis forecast. In the Tealbook forecast, inflation rises toward 2 percent only slowly. The Tealbook baseline uses the new version of the Taylor (1999) policy rule and forecasts a 200-plus basis point increase in the policy rate to support these outcomes through the end of 2018. This is just a little less than one move per quarter. In reality, since the end of quantitative easing, we are moving at a pace closer to once per year. Markets think we may go even slower than this. In my view, this mismatch is hurting our credibility.

This is the main difference between the Tealbook forecast and the new St. Louis Federal Reserve approach. In the Tealbook, there's a long-run steady state to which the economy must converge. As gaps are closed, the policy rate essentially has to return to its long-run normal level. This leads to a 200-plus basis point increase in the policy rate over the forecast horizon. In the regime-based approach, the policy rate can be set for the regime. Gaps can be zero, but the policy rate can remain low because the regime does not require a high value of the policy rate in order to remain consistent with the inflation target. Which approach is better? At this juncture, I think the regime's [laughter], with low unemployment, allows for a better match between the policy choices and the policy environment.

What are the risks to this outlook? Although the comments on Brexit have been extensive, I'm going to comment, nevertheless. I was actually in Europe as Brexit passed, including in London for part of that trip. My judgment is that the ultimate effects on the United

States are negligible. This is a trade negotiation that will likely take many years. In my opinion, the incentives are for both sides to reach a deal eventually. This deal will not be that different from current arrangements. On the basis of conversations that I had in Europe, it seems that contagion to other EU members in the east or south of the EU is unlikely. Many of those countries have their own reasons for wanting to be in the EU and would not likely vote to get out. Trade negotiations are going on all around the world all the time. One recent example is Canada, which was in a seven-year negotiation with the EU. I never saw it come up here as a concern one way or the other or as a positive upside. So I don't think that this is the kind of thing that's going to affect U.S. monetary policy over the near term or in the medium term.

There's a question of another risk, which would be a stronger dollar post-Brexit. The current dollar move is relatively small compared with the big dollar move in the second half of 2014. The dollar is actually lower today than it was earlier this year. And, furthermore, I think the dollar gets overemphasized around this table. The contribution of net exports to the U.S. real GDP growth, which was discussed earlier, has actually been close to zero over the past four quarters for which we have data—that is, from 2015:Q2 to 2016:Q1. That zero contribution over those four quarters is actually stronger than the net export contribution to GDP growth during 2001 to 2007 or during the 1990s expansion. So in terms of contributions to GDP growth, we're actually doing better over the past year than we did during the entire 1990s expansion or the 2000s expansion. The zero number is despite the very large trade-weighted dollar move in the second half of 2014, which was significant, on the order of 15 to 20 percent, and persistent. You got a big move up and it leveled out, so it was just the kind of experiment that you'd like to see if you wanted to see a large effect from the exchange rate. There was an effect of the dollar move, I think, on net exports, but it looks like it was mostly in 2014:Q4 and 2015:Q1. In those two

quarters, we did get outsized negative contributions of net exports to GDP growth. That period seems to have borne the brunt.

My anecdotal reports from manufacturers around the Eighth District seem to suggest that the big dollar move at that point was a big surprise. It did affect their businesses. They did have to reorganize internationally. But it's not like they hadn't thought about this before. They knew how to go about it. It takes about a year to make adjustments, and it sounds to me like all of these adjustments have now been made, so you wouldn't expect further effects from that particular move in the dollar. As far as a stronger dollar post-Brexit, I don't see that as a risk. Furthermore, I think future monetary policy is already priced in, both for the U.S. central bank and for other major central banks, so I doubt dollar moves are predictable, and I would not count on them as part of the outlook.

Now, other risks to the regime conceptualization of the U.S. macroeconomy: One is Phillips curve effects. We're downplaying Phillips-curve effects. There's no question about it. We have a relatively strong labor market over the past couple of years, and yet this doesn't create any inflation. It's very possible that the Phillips curve would reassert itself, but we're listing that as a risk to the outlook, not as something that we're putting into the baseline case. Also, as several people have mentioned tangentially here, that market-based measures of inflation expectations are extremely low is a concern. Right now, I'm listing it as a risk to the Federal Reserve Bank of St. Louis forecast. And, finally, several people here have discussed asset bubbles. Our approach, frankly, has little to say about this, so we're just listing that as something that is outside the model and something that we will have to make a judgment about at some point in the future. I don't see asset bubble risk as being heightened at this juncture, but it is something I may be concerned about at some point in the future. But the approach that

we've written down really has very little to say to help us make a judgment on that dimension.

Thank you, Madam Chair.

CHAIR YELLEN. Thank you very much. President Kashkari.

MR. KASHKARI. Thank you, Madam Chair. The Ninth District economy continues to perform well. Employment has been growing modestly overall, hampered by anecdotes of ongoing poor labor availability. We often hear that worker scarcity is a problem, that employers can't find workers with the skills that they need. And then usually I turn around and ask them, "Okay. Are you raising wages?" "No. We're not in a position to do that." So I take these anecdotes with a grain of salt. Until we see them raising wages, I don't take much information from them.

The national economy continues to grow at a modest pace. The labor market is in good health overall, but I don't see any signs of overheating. Rather, on balance, when I look at all of the data over the past year, it seems to be moving more or less sideways—not huge wage growth, not employment cost growth, et cetera. I think we're going to be lucky if we see overall 2 percent GDP growth for 2016 as a whole. On the inflation front, inflation continues to run below target. I don't see clear evidence of a sustained move upward toward our 2 percent target. And, as others have noted, some measures of inflation expectations are worryingly low.

Internationally, I have more concerns. If I just think objectively, developments since our previous meeting have not been positive. Our base case was "No Brexit." We had the Brexit, so that's a negative even if it wasn't as bad as we'd feared. We've seen fresh strains in global banks, especially in Italian banks. We saw a potential coup in Turkey. We've seen repeated terrorist attacks. Some of these are not economic events, but they nonetheless affect confidence, and they're all tilted to the negative. Now, I hope that the U.S. economy will mostly escape

these headwinds coming from abroad, but, like the Tealbook, I do continue to see the risks to the outlook for the real economy and for inflation as tilted to the downside. I don't see these risks as having materially diminished since we last met in June.

One other comment I'll make is that this discussion today makes me think about the optimal control exercise in Tealbook B. And I struggle with this notion. No one is suggesting this today, but I struggle with the notion that there may come a time when inflation is low but we need to get the unemployment rate up. I just struggle with that as not being credible, that we need to get the unemployment rate up when there's no inflation immediately on the horizon. I think that that runs afoul of, really, the mandate that we have been given. So, for me, the optimal control exercise with the asymmetric weight on the unemployment rate gap is the one that I found compelling. We say that 2 percent is a target, not a ceiling. If we really mean that, then we should be as concerned about inflation under target as we are over target. So that's what's governing my thinking as I think through these various options. Thank you.

CHAIR YELLEN. Thank you. President Williams.

MR. WILLIAMS. Thank you, Madam Chair. The data since our June meeting confirmed that the economic expansion is on track. Consumer spending has been notably strong, supported by a healthy labor market, improving household balance sheets, and still-low gas prices. More broadly, my forecast is not much different than it was last month, or, for that matter, from last December when we lifted off. We've seen an easing in domestic headwinds that have been weighing on the economy. Household deleveraging appears to have largely run its course, and fiscal policy has now turned to being modestly stimulative.

In this regard, I think I'd like to make a comment about the discussion concerning r^* and the increase in the value of the dollar. I don't disagree with any of the things that are said about

whether a higher value of the U.S. dollar versus other currencies is like an increase in the fed funds rate, but let's be careful not to double-count. My own view that r^* , for example, is very low is in part because of the increase of the dollar. The higher dollar is one of the factors pushing r^* down, at least in the short run, to the levels around zero that Thomas and I estimate. So I just warn against using both the low- r^* story and the story that attributes it to “the increase in the dollar,” as if we had already raised the funds rate 150 basis points. I think I would just be cautious that we're not double-counting.

At our June meeting, uncertainty from the looming Brexit vote was a significant factor arguing for keeping policy on hold. Although the vote was a surprise, the lasting fallout for the U.S. economy is likely to be minimal. Indeed, U.S. financial conditions, as many have noted, are, on balance, more favorable than they were before our June meeting, when they were already notably more favorable than they were back in December. Short- and longer-term interest rates have moved lower since our June meeting. Mortgage lending standards are reported to have eased further for many borrowers, and equity prices have risen to all-time highs. And the broad trade-weighted dollar is little changed.

In terms of the Brexit risk, I'm going to respond a little bit to what President Kashkari said. When I thought about the risk, I thought there was maybe a 50–50 chance of Brexit. I'm sorry, I'm going to keep saying “Brexit” just to drive Steve crazy. [Laughter] I thought that there was a risk of it happening, and then an uncertainty or huge distribution of what would happen after that. So when I think of the overall risks, in my mind it was 50–50, and it went 52–48, voting for “yes.” It is important to say, “Well, what's happened since then?” And, personally, I have always viewed the biggest risk as being the political risks regarding Brexit. There I view the immediate aftermath—when basically every leader in Britain stepped down,

and there was talk in Europe about rapid activation of Article 50, and all that—as looking like a bad political risk. But since then, we’ve seen the British government actually quickly form again, and the leadership, I think, lay out a position of a slow walk in terms of Brexit. And I think calmer heads have prevailed on the continent politically regarding Brexit, specifically the chancellor in Germany, who’s made it clear that they want to see this process go more slowly. So although I’m not going to pretend that the risks aren’t still there, I do think that in a way—so far, as least—what we’ve seen has been in the less-bad set of possible outcomes.

Although my GDP growth forecast for this year remains close to 2 percent, I think what’s important, at least from my view, is how to think about what 2 percent means in terms of characterizing that both in our internal discussions and our external communications. In this regard, a lot of what I’m about to say is very close to what President Mester said about employment, but let me start with GDP. As I mentioned last meeting, my own estimate of potential growth is 1.6 percent, which is basically what the Tealbook has currently, but that’s also my view on the basis of analysis by our staff of what the longer-run potential growth for the U.S. economy is, in view of the demographic trends and the slow productivity trend that we seem to be on. Now, I did test-run this idea that we’re on a slower path of economic growth with our business contacts, and, in fact, I got very little pushback to this notion. By and large, our business contacts have seen relatively small productivity gains in recent years. None of them were predicting a resurgence, and although they all highlight the use of new technologies and are looking for new ways to increase productivity, the examples they give and the way they talk about it is about incremental gains in productivity. And, of course, they do argue that productivity gains are held back by barriers such as compliance, complexity, cybersecurity, and those kinds of issues.

Given this assessment of potential—1.6 percent potential growth—in my lexicon, “moderate growth” is the sustainable trend increase that we should look for, and it’s on the order of 1½ percent. Now, like the Tealbook, I expect 2 percent growth in the second half of this year, and that’s an above-trend pace that exceeds my estimate of long-run growth as well as the Tealbook’s. So to my mind, 2 percent growth is a solid pace of economic growth, and the economy is on track to exceed potential by a significant amount over the next couple of years.

Similarly, it’s important to recalibrate our thinking and our language regarding employment growth. I know a number of people have mentioned this, but I just want to reiterate it. Job gains have continued to be at a well above their steady-state trend. In 2014 and 2015, the economy added nearly 3 million jobs a year, and this year we are on track to add another 2 million, according to the Tealbook. According to the Tealbook’s estimates—there are a range of estimates out there, and we’ve already heard about a few of them—trend employment is only 85,000 jobs a month, and that’s about 1 million jobs a year. The excellent staff at the Federal Reserve Bank of Chicago, in their recent reexamination of this study, suggested that trend number may be as low as 50,000 jobs per month, or 600,000 per year. Over the first half of this year, we’ve seen monthly job gains of 172,000 per month, which is double—I’m going to do the doubling and tripling rule—what the Tealbook thinks of as trend and more than triple that of the Chicago Fed’s estimate. So I view 170,000 job gains not as “moderate” but as “strong” or even “robust.” And, in fact, it’s unsustainable, because, due to the limited remaining slack in labor markets, we should expect the pace of job gains to slow down. And if we don’t see the pace of job gains slowing down, we will need to raise rates faster than the Committee currently anticipates.

Now, there have been notable month-to-month fluctuations in job gains, with June bouncing back from a weak report in May, but this rebound was largely predictable. Not only were the May gains out of line with the other indicators—and we talked about that at our previous meeting—but identifiable transitory factors held down the May number. Those included the Verizon strike and weather. As I reported last month, my staff looked at county-level data and found that weather affects employment patterns and had a significant effect, especially, on May. According to their model, good weather earlier in the spring pulled forward job gains for May, and when you adjust it for the Verizon strike, job gains in May were about in the 150,000 range. So this same analysis finds that weather effects had very small effects on the June employment numbers.

Finally, in terms of inflation, we remain on course to return to 2 percent inflation. Core inflation was only one- or two-tenths below our objective in the first half of this year, and I'm now going to respond to something that President Evans said. Obviously, in the first half of the year there were transitory factors pushing up core inflation. I recognize that. But it is interesting that we essentially had core inflation of 2 percent, but the anecdotal stories aren't saying that inflation is high. So I'm guessing that when we're at 2 percent underlying inflation, maybe we would not be hearing about that anecdotally, but, again, I'm not taking a very strong signal in the first half. I think there are transitory factors. But my overall outlook continues to be one in which a strong labor market will increase inflationary pressures and bring inflation back to 2 percent.

One of the things that I do regularly to gauge how much confidence I should have in different measures of inflation is to look at all of the different measures of inflation—we talk a lot about the trimmed mean and PCE; we talk about CPI. For each of them, we do a process in

which we basically try to adjust for the different means or trends in the series to make them comparable. When you look through May at all the different inflation indicators that are published, adjusted to have the same mean as the core PCE price index, they're all running about 1½ to 1.8 percent, with 1.6 and 1.7 being right there in the median. So what I find interesting is that all the inflation measures are telling us the same thing. There doesn't seem to be a lot of, shall we say, uncertainty associated with that, and they all have been showing an increase over the past year.

The last thing I'll just mention on risks is that I view them as fundamentally balanced. I do want to comment that, as I think has already been mentioned, perhaps by President Mester, there are always risks, and I think it's very hard to find the upside risks in the news. President Kashkari, the headlines don't say there wasn't a bad thing happening today. They're always going to say there's a bad thing happening. And I know we live in a world in which there's a lot of tragedy and a lot of news on killings or the coup or things like that, but I don't know whether that particularly tells us the risks are greater or less than normal. My own assessment is, we're basically at about the normal over the past 20 years, when there's been a lot of events that happened during that time, too. Thank you.

MR. KASHKARI. Maybe I'm spending too much time on Twitter. [Laughter.]

CHAIR YELLEN. Thank you. Vice Chairman.

VICE CHAIRMAN DUDLEY. I could make a comment. It wouldn't be politic. Thank you, Madam Chair. As has been the case for some time, my baseline forecast hasn't changed much. I think I'm pretty much along with everybody else, expecting the economy to grow at about a 2 percent pace over the next year or two and that this will lead to payroll employment

gains sufficient to produce a gradual further tightening in the labor market. This, in turn, should eventually push inflation back up toward our 2 percent objective.

In terms of the economic growth, I was cheered by the sharp step-up in payroll employment that we saw in June because it did remove a question mark that existed because of the weakness in May. Also, I think the pickup in consumer spending growth in the second quarter is welcome because it confirms our expectation that the high real income gains we saw in the first quarter were actually going to provide more support for consumer spending. It got spread out over a little bit longer period.

Nevertheless, I think it's important not to get too excited about all of this. First, employment growth and real income growth do appear to be slowing, so the supports that we have to consumer spending will likely be less positive. And, second, when you look at the rest of the economy, all the other sectors still have issues. Investment spending has been very soft. Trade and inventories are likely to be drags on economic growth. And we can debate about whether the recovery in housing is slowing down, but I think you can generally say it's been disappointing—it's been upward but slow and choppy. Moreover, I do think there's some risk that election-year uncertainty could have some negative effects on economic activity this year. So I'm of the view, more in the "Kashkari camp" than the "Williams camp," that I think it's unlikely that the economy will surprise us on the upside over the next several months, and I do see some downside risks to growth.

I agree that the initial negative reaction to the Brexit vote evident in the financial markets was very short lived, but there are still a number of channels by which Brexit could still hurt the U.S. economy. We obviously know that U.K. growth will slow as a consequence, and I agree that the direct effect of slower U.K. growth on U.S. trade will almost certainly be very small

because total U.S. exports to the United Kingdom are only about 0.7 percent of U.S. GDP. But it seems to me that there are a number of other channels that could amplify the effect of the Brexit decision on U.S. economic activity, such as the effects on European economic activity and the perceived health of the global banking system and, potentially, on global financial conditions. If you remember, as we went through the financial crisis, we had good days, we had good weeks, and we had good months. And just because the reaction to the Brexit vote outcome has turned out a little bit more favorably recently, I would not conclude that the story is over yet, especially when we haven't really gotten any good evidence about what's actually happening to U.K. economic growth.

One potentially detrimental dynamic I see is the effect of lower interest rates and flatter yield curves on bank profits and equity prices and how this could potentially feed into the availability of credit. Another is that if we do get more economic weakness than we expect, this could lead to a loss in business and consumer confidence, reflecting in part the perception that policymakers may have limited policy options to address that weakness. That's just a vulnerability. Weakness could beget more weakness because of a view that authorities around the world don't have much in the way of ability to respond. And, as many people mentioned, the Brexit vote could also increase political uncertainty not just in the United Kingdom, but elsewhere. I also think some of the socioeconomic issues that led to the Brexit vote outcome, such as fears about immigration and job security, are also very relevant elsewhere.

So, in my view, it's too soon to say whether any of these dynamics will materialize, or, if they do, how consequential that will be. I certainly agree that the situation since the Brexit vote has evolved in a way better than feared, but at the same time, we can't forget that the Brexit vote result nevertheless is a negative shock that I think most of us didn't really expect to be realized.

In the statement language, we sort of imply an answer to the question: Are the near-term risks lower since the previous meeting? And I think that really depends in part on how you weight the domestic economic news since the previous meeting versus the negative news associated with Brexit. I think the risks to the outlook have diminished somewhat since the Brexit vote—in other words, the Brexit effect has been less than anticipated—but I’m not sure the risks have really diminished meaningfully since the June FOMC meeting.

With respect to inflation, I think the outlook hasn’t changed much either. Headline inflation, as anticipated, has climbed a bit this year as some of the earlier energy price declines have fallen out of the calculations. I think core inflation has been broadly stable if we adjust for the seasonal adjustment problems in the core inflation statistics. And I take some signal from the fact that core inflation has stayed broadly stable over the past year and a half, even as you had this downward pressure that you would have thought would be manifesting itself through the strength of the dollar and lower energy prices. So my view is, inflation will be fine in terms of moving back toward the 2 percent objective as long as the economic growth that we expect actually materializes.

In terms of the inflation expectations issue that I’ve highlighted before in past comments, I think in general I’m a little bit less worried now than I was earlier. The University of Michigan measure has stabilized, and the Federal Reserve Bank of New York three-year-ahead inflation measure has been gradually increasing since January and has actually reversed much of the decline that we saw in the second half of 2015. In terms of the market-based measures of inflation compensation, I continue to think it’s mostly about term premium and the relative liquidity characteristics of nominal versus inflation-protected Treasury securities, so I don’t really take much signal from that.

What does this all mean for monetary policy? Well, I think it argues for a cautious approach at this meeting, and although I can support another increase or two in the federal funds rate this year, I also can imagine that economic growth might be sufficiently soft and the outlook could be sufficiently uncertain that it would make sense to hold off for a while longer. So while the economy is growing at only about a 2 percent annual rate, what that means is, we're using up the excess slack in the U.S. labor market only very slowly. I think this can be seen, for example, in the trajectory of the unemployment rate this year, which has essentially been sideways. With inflation below rather than above our target and monetary policy not far from a neutral setting, I don't really see the need to rush. I think this is also reinforced by what I see as asymmetric risk of raising interest rates too early versus too late. If the economy turns out to be stronger than expected, necessitating a tighter monetary policy, I don't think it will be that difficult to catch up, but if the economy turns out to be weaker than expected, our toolkit just isn't as robust. Moreover, the fact that that asymmetry is widely known means that economic weakness could have a more negative effect on household and business confidence than usual, potentially reinforcing the downward pressure on economic activity.

Now, tomorrow—I'm going to foreshadow this—we are going to be essentially debating how much of a forward lean to put into the statement language about September. That's really what tomorrow's about, or what Thomas is going to get into in a few minutes. I'm going to be arguing for only a very slight lean, which I think is embodied in the alternative B language, for two reasons. First, we said our monetary policy decisions are data dependent. I think if we strongly foreshadow that we're going to move in September, it contradicts that. There's just too much time, too much data, and too much uncertainty about where we'll be in September. Second, I think we are losing credibility by foreshadowing future tightening moves and then not

following through on them. I don't think the mistake here is that we haven't followed through. I think there have been good reasons for it. I think, instead, the error has been that we've foreshadowed prematurely before we knew we were actually going to move. If it turns out that we want to move in September, there's plenty of time between now and then to alter monetary policy expectations. What I don't want to do is alter those expectations prematurely before I or we have a firm grasp on whether we actually want to move in September. Thank you, Madam Chair.

CHAIR YELLEN. Thank you, and thanks to everybody for an interesting discussion of the outlook and the risks associated with it. I'd just like to add a couple of brief comments of my own.

As many of you have already noted, we were confronted with two key uncertainties at the June meeting: first, the outcome of the Brexit vote and its global consequences and, second, the implications of the remarkably weak May labor market report. In the case of Brexit, I admit that I really didn't expect the "leave" side to prevail, but I was even more surprised by how quickly financial markets recovered from the initial shock. As a result, it now seems likely that the decision to exit will have only a minor effect on the U.S. economy in the near term. That said, the Brexit decision has highlighted and perhaps exacerbated the vulnerability of European banks. The longer-run political and economic consequences of the vote, as many of you have noted, remain murky for both the United Kingdom and Europe, and those may well pose problems for us down the road.

The recent news on the labor front has been even more reassuring. At the time of our June meeting, one couldn't rule out the possibility that the May report signaled the start of a pronounced slowdown in the labor market. Since then, however, we've learned that payroll

gains rebounded sharply in June to 287,000. In addition, labor force participation rose; involuntary part-time employment more than reversed its May spike; and the broader U-6 measure of labor utilization continued to decline. On balance, these and other indicators confirm that labor market conditions remain healthy and that slack has continued to diminish. Moreover, I anticipate that labor utilization is likely to tighten somewhat further in coming months, as overall economic activity appears to be expanding at a moderate pace, with solid growth in consumer outlays compensating for softness in most other categories of spending.

These developments might seem to suggest that economic conditions, despite some bumps along the way, have ended up about as we anticipated back in late May, when I and several of you said that another increase in the federal funds rate would likely be appropriate in coming months if the labor market continued to improve. But I don't think that's quite right. Back in May, the latest three months of labor market data showed average payroll gains of 200,000 per month, which implied that employment was continuing to expand at a fairly rapid clip that would likely lead to appreciably tighter labor market conditions later in the year. However, average payroll gains on a three-month basis are now running at less than 150,000 per month, a more subdued, albeit still respectable, pace.

Other indicators also support the view that the pace of labor market improvement, while still proceeding, has slowed somewhat in recent quarters. The unemployment rate is essentially unchanged since last fall, as is the share of workers involuntarily working part time. Initial claims and layoffs have flattened out this year, as have hires and quits in the JOLTS data. Finally, business and household surveys of expected labor market conditions either show no improvement or have softened in recent months. This slowing is not especially worrisome, as it may simply reflect the lackluster GDP growth seen around the turn of the year. If so, then

average payroll gains may move back up fairly soon in response to the pickup in economic growth that we've seen recently and the further strengthening that the staff projects. Under those conditions, increasing the federal funds rate in coming months would likely be appropriate to keep resource utilization from tightening too quickly. After all, employment growth, as many of you have noted, eventually has to slow by enough to bring it in line with its sustainable longer-run trend.

But the modest cooling of the labor market that we've seen recently could instead turn out to be persistent, perhaps because trend productivity growth has picked up some after several years of exceptional weakness. And, of course, the pace of employment gains could slow further. If so, the case for raising the federal funds rate in the near term strikes me as less compelling. For example, suppose that, absent another rate hike, payrolls continue to expand at an average pace of 150,000 per month and the participation rate remains flat. Then, by the end of the year, the unemployment rate will likely edge down to only 4.8 percent. Such an outcome would hardly indicate that monetary policy had fallen "behind the curve" as long as inflation is still running well below 2 percent, as the staff projects. In contrast, average payroll gains of 200,000 per month over the second half of this year, especially if accompanied by falling labor force participation, would put the unemployment rate on a much steeper downward trajectory, thus necessitating a policy response.

In contrast to the labor market situation, the outlook for inflation seems to have changed very little since the spring, with the price data coming in about as expected in recent months. Importantly, the downward pressure from past dollar appreciation on the rate of change of import prices has largely dissipated since the turn of the year, thereby adding a couple of tenths to PCE inflation. In addition, the disinflationary effects of past declines in oil prices have decreased

substantially, although they're unlikely to disappear completely until early 2017. Accordingly, it still looks like headline and core inflation will remain close to 1 percent and 1½ percent, respectively, on a 12-month basis through the end of the year. Thereafter, I continue to expect that inflation will move gradually back to 2 percent in the context of a moderately tight labor market.

In anticipation of tomorrow morning's policy round, what does all of this imply for our decision at this meeting? Once again, I think it's appropriate for us to take a wait-and-see approach with regard to adjusting the funds rate. In view of the erratic swings in the recent labor market indicators, I believe that we should collect more data in order to get a better sense of the underlying momentum in the labor market. If the next couple of labor market reports show reasonably strong average payroll gains and the overall outlook remains favorable, then raising the target range would likely be appropriate. But if the evidence suggests that the labor market really has cooled, then I would be inclined to wait, particularly if the price data continue to come in as expected.

Let me stop there. We have dinner tonight, and it's still early relative to that, so I think we've got time for Thomas to give us his 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 noted in your earlier briefings, U.S. financial conditions appear to have become, on balance, more accommodative during the intermeeting period.

The top-left panel summarizes two mechanisms that could explain some of the recent movement in asset prices. The first works through market participants' expectations for U.S. monetary policy—that is, the easing in U.S. financial conditions since the June meeting could reflect market participants' expectations of a more accommodative path of U.S. monetary policy than previously thought. In the wake of the Brexit vote, greater U.S. monetary policy accommodation would provide a more

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

substantial cushion against downside risks coming from abroad and, as a result, boost asset prices in the United States.

The second mechanism focuses on the prospect of greater-than-previously-anticipated monetary policy accommodation abroad. That additional accommodation may have had an effect on U.S. financial markets that went well beyond that associated with exchange rates. For instance, global investors may have responded to lower yields in Europe by rebalancing their portfolios toward equities and other higher-yielding assets, including dollar-denominated assets.

Of course, the two mechanisms highlighted here are not mutually exclusive. Indeed, both may have contributed to the easing of U.S. financial conditions since the June meeting. Nonetheless, their relative importance may matter a great deal for your assessment of the appropriate stance of U.S. monetary policy and, therefore, for your deliberations on the policy statement.

For instance, to the extent that changes in asset prices since the June meeting primarily reflect expectations of greater monetary policy accommodation in the United States than previously anticipated—the first mechanism—financial conditions could be especially sensitive to your communications. That is, the improvement could prove quite ephemeral if your words or actions were to go significantly counter to market expectations, leading asset prices to make an abrupt U-turn. Accordingly, you might be reluctant to adopt either the first version of paragraph 3 in alternative C—which would greatly surprise the market by announcing an increase in the target range for the federal funds rate—or the second version of that paragraph—which states that the Committee “sees the case for an increase in the federal funds rate as having strengthened since its June meeting.” Instead, you might decide to maintain a wait-and-see approach that likely would leave market expectations for the policy rate path little changed, as in alternative B, or even adopt the language in alternative A, which notes that “the Committee sees the risks to the U.S. economic outlook as tilted somewhat to the downside.”

Turning to the second possible mechanism, the intermeeting changes in asset prices may primarily reflect portfolio rebalancing and search-for-yield behavior on the part of global investors. If so, we may now be importing monetary accommodation. For instance, expectations of a longer period of ultralow interest rates and additional QE in Europe post-Brexit may have kept sovereign yields and term premiums low and boosted the prices of stocks and corporate bonds not just in Europe, but also elsewhere, including in the United States. As a result, movements in U.S. asset prices since the June meeting may well reflect an easing of financial conditions that is not directly associated with anticipated changes in U.S. monetary policy. Again, this raises the question of how the Committee might want to respond.

At this juncture, the staff and most outside forecasters do not appear to anticipate that the change in U.S. financial conditions to date has been sufficient to significantly alter the outlook for domestic economic activity and inflation. Indeed, the Committee might see the easing in financial conditions as a welcome development that—together

with the employment report for June—increased its confidence that the economy is likely to remain on track with the Committee’s modal outlook. Accordingly, the Committee might choose to indicate, as in alternative B, that “near-term risks to the economic outlook have diminished” but leave its policy message otherwise unchanged. In contrast, if the Committee viewed the recent easing in financial conditions as adding more stimulus than warranted by the current state of the U.S. economy, the Committee might decide to offset that additional stimulus by adopting or signaling a less accommodative stance of monetary policy, as in alternative C.

What does the incoming information since the June meeting tell us about the relative importance of the two mechanisms discussed thus far? The evidence pointing to changes in U.S. monetary policy expectations as the primary mechanism underlying the recent easing of U.S. financial conditions is not all that compelling. Although respondents to the latest Desk surveys generally have marked down their funds rate expectations for longer projection horizons—a revision that may well have been influenced by the results of the June SEP—the expected federal funds rate path implied by overnight index swap quotes—the solid lines in the upper-right panel—is virtually unchanged, on net, since the June FOMC meeting. Similarly, the two-year Treasury yield (not shown), which tends to be very sensitive to market views on the funds rate outlook, is little changed. And, as shown in the middle-left panel, quotes from federal funds futures options imply that the probability distribution is now more concentrated around “one or none” for the rest of the year, but its center has shifted only slightly to the left.

The remaining charts in my handout summarize information that you may find useful in assessing the relative importance of the second mechanism, the notion that portfolio rebalancing and “reach-for-yield” behavior on the part of global investors may underlie the recent easing of domestic financial conditions. The chart in the lower-left panel shows that downward moves in longer-dated Treasury yields in the roughly two-week period that followed the Brexit vote were largely concentrated at the beginning of the London and Tokyo trading sessions. This pattern would seem to suggest that global investors indeed may have been engaging in efforts to rebalance their portfolios toward longer-term U.S. Treasury securities and possibly toward other dollar-denominated assets such as corporate bonds.

Consistent with this view of the relative importance of global factors in explaining recent changes in U.S. Treasury yields, the middle-right panel shows the ratio of two measures of volatility in the Treasury securities market: volatility of the 10-year Treasury yield during the overnight trading session—which is dominated by trading in Tokyo and London—and volatility during the New York City daytime trading session (which is 8:00 a.m. to 5:00 p.m. local time). It is quite evident that, relative to the daytime session, Treasury market volatility in the overnight session has risen appreciably post-Brexit.

Lastly, as Lorie discussed in her briefing and as shown in the bottom-right panel, respondents to the latest Open Market Desk survey have overwhelmingly pointed to

spillovers from low or declining yields abroad as a main factor explaining the recent decline in the five-year, five-year-forward nominal Treasury yield.

Thus far, I have focused on the potential implications of recent financial developments for your deliberations on the draft statements included in your handout. More broadly, the draft statements differ importantly in their assessments of other information received over the intermeeting period. Specifically, alternative B would acknowledge the strong June labor market report and the further increase in labor utilization while leaving the Committee’s modal outlook essentially unchanged. Compared with the June statement, the key innovation in alternative B is the assessment that near-term risks to the outlook have diminished.

Alternative C offers a more sanguine view of inflation developments than alternative B and notes that the Committee now “sees the near-term risks to the U.S. economic outlook as nearly balanced.” In contrast, alternative A projects greater pessimism regarding the inflation outlook. It would state that the risks to the U.S. economic outlook are “tilted somewhat to the downside” and would signal that a near-term increase in the target range for the federal funds rate is unlikely. Thank you, Madam Chair. This concludes my prepared remarks.

CHAIR YELLEN. Thank you. Are there questions for Thomas?

VICE CHAIRMAN DUDLEY. Yes, I have a question for Thomas.

CHAIR YELLEN. Vice Chairman.

VICE CHAIRMAN DUDLEY. Couldn’t you interpret the ratio of overnight to trading-hour volatility differently as just an indication of where the information arises in the world that affects people’s outlook of global economic growth and the market for U.S. Treasury securities? For example, couldn’t you get this spike because the Brexit moves occurred over there? Normally, the volatility is below 1 because most of the news relevant to Treasury securities happens here in U.S. time. So it might not be anything having to do with global portfolio rebalancing. It might just be due to where the distribution of the important news falls. If our news is boring and their news is really interesting, then I would expect that the volatility during overnight sessions would go up relative to the volatility in U.S. sessions.

MR. LAUBACH. That's right. One concern here could well be that because the big event was Brexit and it clearly showed up during overnight hours, that's what's driving the result.

VICE CHAIRMAN DUDLEY. Yes, because it is a one-month rolling volatility, the Brexit event is a tremendous pull.

MR. LAUBACH. Yes, that's right. Now, that said, the lower-left panel actually excludes the Brexit date itself. Those data start only on June 26, so you do see that even after the Brexit event had passed you still have this development.

VICE CHAIRMAN DUDLEY. I find the lower-left one more compelling. So I guess we agree. [Laughter]

CHAIR YELLEN. Are there other questions for Thomas? [No response] Okay. Seeing none, why don't we adjourn for now? We have a reception and dinner, as usual, across the street, and we will reconvene at 9:00 a.m. tomorrow.

[Meeting recessed]

July 27 Session

CHAIR YELLEN. Okay. Good morning, everybody. Let's get started. We have a data release this morning. Let me ask David Wilcox if he'd like to comment on that.

MR. WILCOX. I don't have a detailed readout. I did just speak with our sector specialists, and they're still processing the data. It's clear that the release is weaker than we had anticipated. This is the advance report on orders and shipments of durable goods, which feeds into the BEA's estimate of equipment and intangibles investment. This release, probably more than any other, is very opaque to read. Translating the orders and shipments data into estimates of equipment investment is not straightforward. It's clear, though, that this will take our estimate down into negative territory. We'd had real equipment and intangible investment about flat in the second quarter. This will take it down by about 1 percentage point. That's probably worth about one-tenth on the growth of GDP in the second quarter—we were at 1.8 in the Tealbook, and we're probably down at about 1.7 now—and another one-tenth out of the third quarter, give or take. So that would put us at about 1.8 in the third quarter.

CHAIR YELLEN. Are there any questions for David? [No response] Okay. I guess we're ready to begin our policy round. We already do have one suggestion on the table for an edit to the statement pertaining to residential investment. So let me tee that up, and I will ask you as we go around if you would like to comment on your views about this change. President Williams—and I did hear some support from others—suggests that in alternative B, we simply delete any reference to residential investment rather than saying that it, along with business fixed investment, has been soft. So the sentence would read “Household spending has been growing strongly but business fixed investment has been soft,” and that would be an alternative to the wording that's currently in alternative B. As we go around, I would appreciate it if you would

comment briefly on that change. Okay. We're going to begin our go-round with Governor Tarullo.

MR. TARULLO. Thank you, Madam Chair. I support alternative B, even though I find some of the language of alternative A to be more compatible with my views.

The additional sentence in paragraph 2 of alternative B on the diminution of near-term risks is in itself correct, though by not mentioning the admittedly hard-to-quantify medium-term risks to the global economy associated with the Brexit vote result and its aftermath, the sentence perhaps leaves a marginally more upbeat message than might be strictly accurate, at least with respect to international risks. But I'm willing to accept the sentence as it is.

The inclusion of this sentence obviously reflects at least some shift in the Committee's risk assessment and thus some reorientation of its monetary policy stance, but the statement wisely omits any language suggesting some lean of the Committee toward raising rates at an upcoming meeting. Of course, conditional on my current assessment of economic conditions, I would oppose any such language on substantive grounds, but I think that, no matter what one's policy view, institutional considerations—namely, the Committee's credibility—argue against inclusion of any such language. We don't want another instance in which language that raises the prospect of a rate increase in an upcoming meeting is interpreted by markets as perhaps less conditional than it was actually intended by the Committee or its participants.

Market expectations of the path of the federal funds rate and of the likelihood of an increase at specific upcoming meetings have indeed adjusted in response to the ups and downs of recent economic data and developments. Because a good bit can happen between now and the remainder of this year's meetings, and on account of the propensity of markets to overread any suggestion by the Committee of an increase at a particular meeting or in a particular time frame,

we should let the economic data do more of the talking for us. Should market expectations vary too substantially in either direction, the Chair, at her discretion and depending on her assessment of where the Committee stands, could use her public speaking opportunities, including but not limited to her Jackson Hole speech, to affect these expectations. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Williams.

MR. WILLIAMS. Thank you, Madam Chair. I support alternative C. The uncertainties that argued for a delay at our June meeting have largely been resolved, with a favorable baseline economic outlook intact. A broad range of labor market indicators continue to point to conditions consistent with full employment, while inflation remains on a gradual upward trend toward 2 percent. Continued delay in raising the funds rate risks putting us “behind the curve” and creates the risk of greater fallout if we have to hike rates quickly to get back on track. Now, I know it’s popular to describe the glacial pace of policy adjustment as cautious, but, to my eye, this approach is becoming increasingly risky in terms of raising future potential risks to financial stability and the economy. This echoes remarks that Presidents Rosengren and Mester made yesterday.

In principle, I would support a rate increase today, but that would be highly confusing and disruptive against the background of our prior communications. So I strongly prefer alternative C with paragraph 3’, which indicates that the case for an increase in the funds rate has strengthened over the intermeeting period. Short of alternative C, we should at least explicitly acknowledge in alternative B that the case for raising rates has increased and certainly hasn’t diminished. This optionality allows for data-dependent adjustments as we go forward, but with the modal federal funds rate path of the June SEP still on the table.

In contrast, alternative B as written will likely be understood as indicating that a September increase is unlikely, thus precluding the possibility of two rate hikes this year. This would be viewed as a downward revision to the near-term funds rate path relative to our median and modal June SEP numbers. As conditions since June have stayed on track or even improved relative to expectations in some respects, such a shift to lower rates and greater monetary accommodation seems out of tune with our strategy and with our communications up to this point.

I have a couple of comments on the statement language, which I found problematic in a number of respects. First, in all three alternatives, paragraph 1 refers to the swing in job gains in May and June. This specificity about the monthly data releases may strengthen market perceptions that our actions are—in the apt phrasing of Governor Brainard—data point dependent. Our communications should not foster a fixation on the monthly ups and downs of the data. So I would simply delete the sentence in alternatives B and C that says “job gains were strong in June following weak growth in May.” Second, as I’ve already talked about and as the Chair mentioned, I would strike the phrase “and residential investment” in paragraph 1. I just want to remind us that real residential investment jumped at an annual pace of 15 percent in the first quarter. Although recent indicators suggest some slowing of residential investment, this is only a partial payback for the torrid pace of growth early in the year. And I think it would misrepresent the situation to characterize homebuilding as soft and would be especially misleading to lump residential investment together with business investment, as the latter has been on a notable downtrend for quite some time. Thank you.

CHAIR YELLEN. President Evans.

MR. EVANS. I'd just ask a question—perhaps of Thomas—because we hadn't had any discussion about omitting the phrase about residential investment. Last time, it was referred to. If you take it out, is there any mention of residential investment? How do market watchers generally respond to some complete omission? Is it going to get more prominence or less prominence?

VICE CHAIRMAN DUDLEY. You're also taking out the reference to trade.

CHAIR YELLEN. Yes, the reference to net exports is going, too.

MR. EVANS. Okay. Could I just ask the staff their opinion on this?

MR. LAUBACH. Yes. To be upfront, I have a very hard time making good guesses about how market watchers might respond to changes.

MR. EVANS. I understand that. That's okay.

MR. LAUBACH. But, that said, one interpretation is that there's no news. That is certainly what we intended with the striking of the reference to net exports, because there was really nothing new to report.

Now, I have to confess that I don't know exactly when the reference to residential investment was added to the statement. I would have to look that up. It's certainly been in there for a number of rounds, but it hasn't always been there. I would think that it will be noticed as a downgrade, because if you no longer say that it's improving, it seems to imply it's doing less, and that would be consistent with the recent data flow. So my guess would be that it would be interpreted as a soft downgrading.

MR. EVANS. Okay. Thank you.

CHAIR YELLEN. President Lacker.

MR. LACKER. Thank you, Madam Chair. In my mind, the most useful benchmarks for evaluating the stance of monetary policy are the policy rules that seem to capture the way we've behaved in past periods during which we were relatively successful. One can argue about the details of particular rules, but just about every one that makes it to our desk has the policy rate deviating from normal in response to an inflation gap and some measure of a real-activity gap. Because these gaps are small now, we should be returning our policy rate to more normal settings, with an adjustment for the possibility, of course, of a lower natural real rate.

Tealbook B puts the prescribed policy rate for either Taylor rule at about 2.4 percent, and that's 200 basis points away from our current policy setting. A departure from our benchmark of that magnitude is fairly large. One might argue that the natural real rate is lower than the 1 percent value assumed by the Tealbook staff. For example, the current estimate using the Laubach-Williams procedure is around zero, and the Lubik-Matthes estimates are very similar. Even in this case, though, the prescribed policy rate would be 1½ percent, more than 100 basis points higher than the current rate, and I think that's still a large gap by historical standards. We've occasionally been 100 basis points away from the Taylor rule in the past, but never for a sustained stretch. On top of that, it's worth pointing out something about the Laubach-Williams procedure. Their procedure produces a joint estimate of the natural real rate and the output gap, the two latent variables in their set-up. Their current estimate of the output gap is large and positive, about 140 basis points. The natural, internally consistent way is to apply both their natural real rate and their output gap estimates at the same time, and the net effect of doing that results in a Taylor rule policy prescription of 2¼ or 3 percent, depending on whether you use Taylor (1993) or Taylor (1999). This again implies that the funds rate is now very far below where it should be by those prescriptions.

Some would say that the real-activity gap might still be negative, as opposed to the staff's calculation of an essentially zero output gap. This would imply a lower Taylor rule prescription. For example, a natural unemployment rate of 4 percent or lower would justify the current policy rate. Now, 4 percent is well below all of our estimates of the natural rate, but those estimates, of course, are notoriously imprecise. So I can understand the motivation for delaying an increase in rates. We'd all like to see more employment opportunities for as many Americans as possible. But theory and experience tell us that there are risks on both sides. Waiting too long to raise rates can leave us with a higher unemployment rate later on as we fight against an increase in inflation.

There's an argument that we're perfectly capable of responding effectively if inflation should surge, but our ability to do so depends on inflation expectations remaining anchored or, if they start to drift, on our ability to manage and contain them. At present, our understanding of the formation and evolution of expectations is fairly limited. They may seem anchored now, but they've been quite variable at times in the past, and I don't think we have much of an analytical basis for predicting how or when they might become unanchored. But I think we do know that unstable expectations in the past have been associated with departures from good benchmark policy rules. If expectations become unanchored, then it would surely reflect beliefs that we are departing from those past patterns of behavior. And, surely, if expectations are anchored, it reflects a sense that we're going to continue in a way that's relatively consistent with those past patterns of behavior. I think it should be evident that the further we deviate from those benchmarks, the greater the risk that inflation and inflation expectations break away. So I think that there are serious risks associated with probing, as the phrase is, to see if the natural rate of unemployment might be below where we are right now.

We've delayed raising rates this year in part because of events that have caused uncertainty arise. When uncertainty subsides, as it clearly has now, we should seize the moment and get on with it rather than continue to fall further behind our benchmarks. I think now is one of those times, a time for opportunistic normalization. So I support alternative C and paragraph 3.

CHAIR YELLEN. Thank you. President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. I support alternative B for this meeting, although I could have also been supportive of some of the stronger language in alternative C. My preference for this meeting is for a statement tilting more strongly toward indicating an increase in the federal funds rate at the next meeting. I view the statement as leaving open the possibility of an increase in September, but I think it is unlikely to raise the market probability of a September increase as much as I view is warranted. I am not arguing for calendar-dependent promises in the statement. The volatility in payroll employment over the past two months, as well as the surprise Brexit vote, highlights risks in such a strategy. But the relatively modest changes in the statement outside of the first paragraph are likely to leave many outside of this room expecting no change in September. If incoming data are consistent with my forecast, which I see as requiring a rate increase in September, we may need to use speeches and other opportunities to communicate to the public the increased probability of a September move.

Stepping aside from the near-term tactical decisions, I think it's important to reframe how we have been thinking about policy normalization. Because we have been extremely and justifiably patient to date in ensuring the economy gets very near our dual-mandate goals before raising the funds rate, we should not view our decisions as balancing on a knife's edge between action and inaction. At this point, I believe that we should change from a default of no action

unless everything is perfect in the next six-week period to a default of a plan to take action unless circumstances significantly alter our outlook. That is, my preference would be that unless incoming data and events suggest a material change to the forecast, we should tighten in September.

My estimate of the natural rate is 4.7 percent. As a result, I believe that a baseline forecast that results in a 4.3 percent unemployment rate implies that we will need to tighten more rapidly. If we receive evidence that suggests that the natural rate is in the low 4s, we can slow down the rate of increase in the funds rate increase later on in the normalization process. Further, there remain some upside risks relative to our baseline outlook, and were those risks to materialize, we would, of course, need to tighten even more quickly. But such rapid rate adjustments run an even greater risk of jeopardizing the attainment of full employment. Finally, uncertainty regarding the estimate of the equilibrium interest rate further bolsters the argument for gradual tightening, as a gradual increase affords us the time to gauge whether we have gone too far or not far enough. For all of these reasons, I am concerned that we may be waiting too long to remove accommodation, with a consequence of having to raise rates more rapidly later in the normalization process, placing the attainment of full employment and price stability at greater risk than is warranted.

And I would remove the reference to residential investment.

CHAIR YELLEN. Thank you. Governor Fischer.

MR. FISCHER. Thank you, Madam Chair. In making my decision as to which of the three alternatives to support, I found the material on pages 30 to 35 of Tealbook B very useful. That's the material that makes the case for supporting each of the potential decisions. On the basis of the arguments set out in those pages and other evidence and considerations—including

the comments I made at our previous meeting, which was only six weeks ago—I support alternative B. Alternative B makes a case for leaving the federal funds rate unchanged at this meeting and avoiding “signaling the timing of the next policy move.” I would, nonetheless, like to comment on some of the statements made in “The Case for Alternative B” on pages 30 and 31 of Tealbook B and to say that there’s a difference between signaling the precise timing and signaling an approximate timing or signaling that the next policy move has come closer.

All right. Here are my comments on the arguments in Tealbook B. There are two statements in the Economic Outlook section on page 30 of Tealbook B. One says “Policymakers may view the information they have received about the labor market and real activity as consistent, on balance, with their modal forecasts at the time of the June FOMC meeting.” And the second says “Policymakers may judge that near-term risks to the economic outlook have diminished.” I disagree with the first statement. I believe the data we received on June payrolls and the effects of Brexit are better than my forecasts in June would have been had I made one. I do believe that near-term risks to the economic outlook have diminished. With regard to longer-term risks, I believe that the Brexit decision will result in more uncertainty about political and economic developments in the United Kingdom—or at least in what is now the United Kingdom—and the European Union, but that this will have relatively little effect on the United States unless it leads to major changes in the structure of the EU.

The analysis of the labor market in this section of Tealbook B says that “a range of labor market indicators points to increasing utilization; however, the unemployment rate, at 4.9 percent in June, is unchanged, on net, since the beginning of the year.” When the unemployment rate was well above 5 percent, we began to say that to raise the interest rate, we’d need to see continuing improvements in the labor market and an increase in inflation. I believe we’ve seen

improvements in the labor market in recent months, particularly including in increases in the participation rate. But, at some point, we'll have to say that maintenance of strong conditions in the labor market is the situation we want to sustain. And I believe that an unemployment rate of 4.9 percent is near enough to most people's measure of full employment to say that we're close to having a strong conditions in the labor market, although no doubt we would all be happy to discover that a lower unemployment rate, somewhere around 4.5 percent, is consistent with maximum employment, stable prices, and the maintenance of strong conditions in the labor market.

My next comment is that we need at some point to take a closer look at what behavior we demand of the inflation rate. Over the past year, we have allowed ourselves to imply that inflation is too low if it is less than 2 percent, without recognizing that there's a difference between an inflation rate of 1.6 percent and one of 1.2 percent. We have accepted that we'll treat divergences from the inflation target symmetrically. Is there anyone here who will fight to reduce the inflation rate from 2.2 percent to 2 percent when we reach 2.2 percent?

Next, the Policy Strategy section states that "the rebound in job gains represents only one month of data. By the time of the September FOMC meeting, policymakers will have seen two more employment reports and may have a better sense of the underlying trend in employment growth." I agree with that. But I believe that September should not be ruled out as being too soon to raise the rate if the incoming data are very positive, and I do not think we're far from making such a decision.

The final argument in "The Case for Alternative B" in Tealbook B is that "a decision to maintain the current target range for the federal funds rate would be in line with the expectations of financial market participants." In our discussions, we should recognize that what financial

market participants believe is heavily influenced by what we say, and that nothing we have said of late would cause them to think that the decision will be anything other than to keep the interest rate unchanged. And we know that if we were to send a different signal about future interest rates than that implied by alternative B, financial market participants would have different expectations. So I find some conflict, to some extent, between what is said at the beginning in this discussion about how we think that the data we've received is better and the fact that we take comfort that the markets agree with us. The markets should have raised their expectations a little bit, and they haven't because we're sending a very clear message, one that I think is too strong.

Let me conclude. We're close to our full employment objective. The underlying pace of inflation is not far from 2 percent, and our best guess at the value of the equilibrium real federal funds rate is near but above zero, and we're below it. Now, depending on the data, it could be appropriate to take another cautious policy step in September. Aside from the last word of the statement, which in June was "July" and has now become "September," this is what I said and believed six weeks ago. And I hope that one of these months, one of these six-week periods, what I hope and believe will happen in the next meeting will happen. Thank you.

CHAIR YELLEN. Thank you. President Bullard.

MR. BULLARD. Thank you, Madam Chair. I do not think the normalization process is going well. We ended QE in the fall of 2014. We said we would begin normalizing rates in 2015. We made only one move that year, at the last meeting of the year. We have made no further moves during 2016. This is against a backdrop of an economy that has not behaved very differently from forecasts of a few years ago, especially on inflation and unemployment. Unemployment has tended to surprise to the downside for us, and inflation has actually been very consistent with the forecast that it would remain below 2 percent.

This is in contrast to our narrative for normalization embodied in the Tealbook and in the Summary of Economic Projections. As I discussed yesterday, the Tealbook narrative suggests that we are on the precipice of a 200-plus basis point increase in the policy rate over the forecast horizon. This is a little less than once per quarter. This comes from using the updated Taylor (1999) rule, which also informs many others and has historically informed many judgments among the Committee about the pace of rate increases. According to the Tealbook, these increases are going to take place against a backdrop of relatively weak economic growth in the near term, an unemployment rate that is just three-tenths lower at the end of 2017 than it is today, and an inflation rate that remains below target. I do not think that this is a realistic narrative. I think it forces us to draw on increasingly tenuous excuses as to why we are not following through on our announced plans. This is hurting our credibility. Markets discounted this narrative long ago, and our actions this year are ratifying their expectations.

The St. Louis Fed's new narrative improves on this situation. It suggests a relatively flat policy rate path with some upside risk, depending on how the data evolve. It does not leave a 200-plus basis point policy move lingering over the market. It suggests that r^* is minus 140 basis points, which is the ex post real return on one-year Treasury securities over the past three years. Real returns on short-term government debt are unlikely to switch to higher values any time soon, nor is mean reversion a good prediction. The best guess is that this situation will simply persist, at least over a period of two to two-and-a-half years. The St. Louis Federal Reserve narrative realistically suggests that the current slow-growth environment is likely to continue. It suggests that the labor market is essentially at full employment and perhaps will not improve further, in a situation of relatively slow growth. It also suggests that inflation does not look set to increase very far above our 2 percent target.

The conclusion is that a relatively low policy rate is consistent with achieving our inflation target and full employment over the next two and a half years. Adoption of the St. Louis approach would, in my view, improve the alignment of market expectations with the likely future path of policy. For today, I support alternative B. The Federal Reserve Bank of St. Louis approach does call for one more rate increase, and I would be happy to make this move at the September meeting, provided the data cooperate. I do prefer to move on good news about the economy. I would also support President Williams's suggestion on residential investment. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Harker.

MR. HARKER. Thank you, Madam Chair. In light of my fairly upbeat outlook for the economy and the slow but persistent march of inflation to target, the language in alternative B seems a bit too equivocal even after the most recent changes.

The two matters we talked about yesterday, the two most pressing concerns at our June meeting, have dissipated. In June, 287,000 net new jobs were added, and financial markets were generally unfazed by the Brexit vote after the initial shock wore off. I welcome the recent change to paragraph 2 stating that the “near-term risks to the economic outlook have diminished.” That said, the message in alternative B is only modestly changed from June, and I fear that the reaction will be similar, taking the next meeting off the table. It could also very well indicate that our policy is insufficiently sensitive to events on the upside. That insensitivity may, in turn, serve to confuse markets on exactly what types of data will be sufficient for normalization to proceed. If we are delaying normalization because we need much greater evidence that inflation is indeed trending upward, then perhaps we should make that point more explicitly. Or if uncertainty over the level of the natural real rate leads to the belief that policy is

not overly accommodative, that point should be articulated. But whatever is driving the unresponsiveness of policy needs to be stated clearly. Communicating a very similar message either in the statement or in public comments under what I perceive to be clearly improved economic circumstances does not seem to represent a strategy that will allow a September rate increase to be a realistic option.

So what can we do? While I can live with alternative B as is today, one possible improvement is to add language, like that in alternative C, stating that the near-term risks to the economy are nearly balanced or have become more balanced, instead of saying that they have diminished. This more positive tone in the language would send a clearer signal that September is a possibility without overpromising that a move would indeed occur. And on residential investment, I also support President Williams's view. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Madam Chair. I support alternative B with both proposed amendments by President Williams. That includes the one on job gains in June versus May for the reasons he articulated. So I support both of those edits.

I do think the case for removing some amount of accommodation has strengthened since June. First, on the pro side, I believe we are making progress in achieving our dual-mandate objectives. In particular, the Federal Reserve Bank of Dallas trimmed mean as well as other, similar measures of core inflation are gradually moving in a direction that suggests we will reach our inflation target in the medium term. I think labor market slack is declining and we are moving toward full employment, and I hope that upcoming data will give us an opportunity to confirm this.

Second, I believe excesses are building, although not to the point at which I'm alarmed. As has been discussed, I am concerned about commercial real estate. I'm also—I must say, maybe colored by my background—concerned about what I see in stock market valuation. By my measure—and I'm using a per-share number of \$115—market P/E is getting close to 19 times earnings in a period when corporate earnings are actually declining. I'm concerned about where the markets are going to go from here. My experience is, when stock market valuations become excessive, there may be imbalances building up outside the banking system, particularly in the nonbank financial markets, some of which we, at the Federal Reserve, are not able to see. I'm slightly concerned about the buildup in nonbank financial debt—that is, on the corporate side—although I think that's still manageable. And I do worry about distortions in asset allocation—disincentives for savers as the population ages and people tend to live off their incomes—and I'm worried overall about a rise in risk-taking, particularly as we move from here.

In terms of the cons, I do believe the market is certainly unprepared today for us to raise rates, as we know, and they seem to be not quite prepared for September, either. I do think the uncertainties of Brexit as well as China—which, to me, is a significant risk—are unlikely to be resolved any time soon. Between now and September, though, we'll get a little bit better clarity on the Italian bank situation, which I do think is worth watching. And, obviously, we'll get two additional job reports, which will help in confirming the trend on the labor markets. We'll also get a chance to more clearly see if the recent strength in new home sales translates into a pickup in permits for single-family homes.

I'm also persuaded by our work and the comments made here regarding the neutral rate that it is lower than widely recognized. I agree with President Harker that we have not clearly communicated this. I do think that we are not as accommodative as is widely believed, and, on

the margin, that reduces the urgency for us to move or, to say it another way, allows us to be patient.

But in light of all of this, as I said, I favor alternative B as amended, although I am forward leaning in us gradually and patiently moving toward removal of accommodation. As we approach our September meeting, I would hope that if incoming data warrant, FOMC communication, potentially from the Chair at Jackson Hole or some other venues, will, as has been suggested, begin to signal to the market that we believe removal of some accommodation is warranted in the near future. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Evans.

MR. EVANS. Thank you, Madam Chair. I have no objection to the change in language with regard to housing. I would think it would be better to come up with a characterization of what it is rather than just deleting it entirely. I think what happens in this case is that people probably think, “Oh, they mentioned housing last time. Let me go see what the latest data were. I can’t remember.” And if they see that the data were kind of soft, they’re going to have to come up with their own interpretation. But I don’t have any objection to omitting it.

On the basis of my outlook and my expectations for continued data confirmations, I support alternative B as written. As I mentioned yesterday, my economic growth outlook has not changed materially since June, though I do think the downside risks have diminished some. I’ve also made no changes to my inflation outlook or my readings of the downside risks to it. I think alternative B captures these sentiments for me.

Clearly, more of the focus today is on what we’re going to be doing in September and beyond. If there were no material changes to my baseline forecast or risk assessments, then I could see the case for a rate increase in September. It’s not my preferred course, and it would be

a close call. However, I would not support a September move if our communications led markets to think that a second increase in December was highly likely in the absence of very strong data. I think it's important that we allow adequate time to assess the economic reactions to our next policy move before taking the next step after that. Maybe conditions would improve enough to justify another move in December, but my base case is, they will not. Either way, in my opinion, there's just too much uncertainty to precondition markets to expect an end-of-year funds rate target in the range of 75 to 100 basis points.

As I mentioned last round, I continue to be attracted to the forward-guidance language in alternative A. It says "The Committee judges that an increase in the target range will not be warranted until the risks to the outlook are more closely balanced and inflation moves closer to 2 percent on a sustained basis." Frankly, I would wait until core PCE is 2 percent and projected to be at least 2 percent over the forecast horizon. This is a strong commitment to our symmetric 2 percent inflation target, one that would likely provide much needed support to private inflation expectations. Our inflation projections would benefit more from an increase in inflation expectations than from a lower unemployment rate. I disagree with President Lacker on this issue, because I think the evidence favors viewing inflation expectations as moving lower than our inflation objective and not the case that he was worried about in terms of them being unstable on the upside.

Regarding Governor Fischer's question as to whether Committee members would fight inflation of 2.2 percent if it was above 2 percent, I actually have no evidence on that. After seven years, I have no data points to answer that, because we haven't had inflation above 2 percent. In the spirit of something a bit more like alternative A, I would feel much more comfortable increasing rates in September if by then core inflation appeared clearly positioned to

come in higher than my 2016 forecast, which, like the Tealbook's, is 1.6 percent. President Williams suggested yesterday that recent core inflation has been 2 percent, and others have made sympathetic comments about that as well. I hope that continues in the coming months and years even if the most recent monthly averages are like that.

Finally, policy asymmetries continue to argue for our communication that a very shallow expected path for normalization is appropriate, as our SEP submissions display. We're still only a modest negative shock away from returning to the effective lower bound, while, on the other side, if an inflation shock occurs, the inflation process is inertial enough that we most likely can avoid any meaningful overshooting of 2 percent with modest increases in rates and the low r^* we expect into the indefinite future, at least according to the most recent Laubach-Williams update that I saw. Also, as I discussed yesterday following the QS report, I see the apparent changes in long-duration investor attitudes as diminishing potential financial instability concerns that might be associated with a modestly steeper tightening than our recent SEP displays. If real-money investors have come to believe that low equilibrium interest rates are a fixture of this economy, then we face a lower chance of experiencing a taper tantrum–like fillip in financial conditions if we have to pull policy normalization forward in time.

In sum, I remain on the fence about a move in September, but whatever we do then, I think we should continue to communicate our basic policy strategy for slow, gradual rate increases dependent on the Committee's confidence in achieving its dual-mandate goals in as timely a fashion as possible. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kashkari.

MR. KASHKARI. Thank you, Madam Chair. As a Committee, we continue to debate whether we are approaching a point when further rate increases are appropriate. Because we

can't perfectly foresee the future path of the economy, as many others have said, I'm in favor of taking a risk-management approach and avoiding policy choices that could lead to especially poor outcomes. In my view, the costs associated with a monetary policy stance that, after the fact, turns out to be too tight are likely much larger than the costs of a stance that, after the fact, turns out to have been too loose. Many others have made these comments as well.

Regarding the alternatives presented, I support alternative B, but I don't have a strong view on President Williams's changes. I'm okay with those changes either way, but I personally am not in favor of the language that was added to paragraph 2. I understand the distinction between near-term risks and medium-term risks, but I think it's a little bit too subtle. It isn't clear to me that the risks to the economic outlook have diminished. And, maybe more important, I don't think the phrase is actually necessary to preserving optionality for September. I think the statement as written preserves that optionality. We always say that every meeting is a live meeting. So why do we therefore have to signal that we really mean the next meeting is "live," if we always say that every meeting is a "live" meeting?

In filling out the June SEP, I indicated one increase in the federal funds rate for 2016 because I expected that, and I hope now that tightening labor markets will continue to push inflation toward our 2 percent target. I haven't seen the evidence of that yet. I know that in recent months, there's been a little bit of an uptick, but on a year-over-year basis, there's not any real evidence of it. So, for me, I need to see real evidence that we're moving toward 2 percent before I can support a rate increase. Thank you.

CHAIR YELLEN. President Lockhart.

MR. LOCKHART. Thank you, Madam Chair. I support alternative B. I came to the meeting comfortable with the statement as written, but I have no objection to removing the

reference to residential investment. I don't think it will generate excessive attention even if it is, as Thomas said, a soft downgrade.

For this meeting, I believe it's prudent to exercise patience and let the post-Brexit economic picture, as well as the array of risks and uncertainties regarding the outlook, congeal. I don't think the Committee risks getting "behind the curve" by exercising patience at this meeting. I think it's appropriate to keep all options open for the September meeting. I can foresee conditions that would be a reasonable basis for a discussion of a rate move at that meeting.

In broad strokes, here is a configuration of the incoming data that would make me pretty comfortable that the economy is on a track justifying serious consideration of a rate move. First, second-quarter growth above 2 percent confirmed in official releases. We'll get the first estimate Friday and the second estimate on August 26. We'll also have most of the data releases having direct implications for revision in the third GDP estimate before the September meeting. Second, apparent third-quarter growth consistent with that of the second quarter. We'll have almost all third-quarter GDP source data for July before the September meeting, but not much source data for August. But we will have auto sales for August and, most important, retail sales for August. Third, two more positive employment reports centered on payroll jobs gains comfortably above the breakeven number needed to cover labor force growth. As a marker, I'm thinking of 150,000 per month as being comfortably above that breakeven point. Finally, continuing indications that inflation is firming and moving in the right direction. If a scenario consistent with these conditions plays out through mid-September, as I said, I think the Committee should give a rate increase serious consideration. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President George.

MS. GEORGE. Thank you, Madam Chair. I think Governor Tarullo's comments yesterday about challenging our views and assumptions and being open to changing one's mind is an important aspect of the job we do here. And, because I have found my own views outside the consensus of the Committee from time to time, that kind of self-examination may come more naturally for me. But I agree with him that it is an essential aspect of arriving at sound policy prescriptions. In fact, I think it's an obligation to the effective decisionmaking function of this Committee, to the economic well-being of the public we serve, and with the assurance that history will judge best whether our calibrations indeed achieve their aim. So, with that in mind, I take a good dose of humility before these meetings, and, in that spirit, I'll turn to my view on today's policy choices.

I support alternative C. Since our June meeting, job growth has been solid, GDP growth looks to be back near trend, markets have calmed after a surprise Brexit vote, and inflation outcomes are aligning with our statutory objectives. As a result, I see a 25 basis point increase today as an appropriate adjustment to realized economic conditions, not necessarily a commitment to a preset path to normal rates. Waiting longer to make adjustments is not a benign choice, in my view. It challenges the clarity and the discipline of our monetary policy strategy, and it leans in the direction of accepting risk. As deviations from policy rules become larger, explaining the rationale for not adjusting rates becomes both more difficult and more important. Continuing to appeal to headwinds—including events abroad, a subdued pace of household formation, and low productivity growth—argues for further clarification. Household formation and productivity growth are more supply-side factors, or at least structural factors, that monetary policy is ill equipped to influence. Instead, insofar as these factors at least partially explain

declines in estimates for the longer-run terminal rate, it is the case that adjustments to the rate need to occur sooner.

I am mindful of the fact that financial stability is an essential condition for achieving our objectives for the economy. And I'm concerned that this extended period of negative real rates can create incentives to "reach for yield" and can facilitate the misallocation of capital and the mispricing of risk. But I do not believe raising rates should be a response to those realities. It is too blunt a response, and the ability to both accurately identify these imbalances and time a proper response has historically, both here and abroad, proved challenging.

I do worry about expectations of low rates for even longer becoming ingrained. I recently heard anecdotes from bankers in our District that they have been anticipating higher rates going back to 2011, when the Committee issued its first communication regarding normalization principles, and have managed their balance sheets accordingly. Now they are beginning to adjust those expectations, offering more longer-term fixed-rate loans with assumptions that the unusually low rate environment will persist even longer. This seems likely to be happening in other sectors even if our measures of financial stability aren't yet registering concern.

Finally, I do not view gradual adjustments to our policy stance as a function of judging whether we are "behind the curve." I'd prefer not to wait for that kind of evidence. Continuing to wait to see more data could send a message that our attempts to achieve some degree of normalization are failing or have become unnecessary. At our June meeting, there were questions about whether we need to talk about normalization, and some expressed concern that the goal seemed to be that normalizing the federal funds rate as a default view was risky. I think the Committee should, in fact, take stock of our communications and its strategy in this regard.

Because the Committee outlined on several occasions since 2011 its intended path to policy normalization and then raised the federal funds rate last December, the Committee's credibility will hinge on our ability to clarify that strategy. Although we've not talked about revisiting those principles, I continue to think the reinvestment policy could offer an alternative or a complement to how we think about future rate increases, especially in a world that continues to demand safe assets.

And, finally, Madam Chair, on the language change, I can support dropping the reference to residential investment. I think that, either way, some in the markets will note whether it's there or not there.

CHAIR YELLEN. Thank you. Governor Powell.

MR. POWELL. Thank you, Madam Chair. With my baseline assumptions, I see the appropriate path forward as one of gradual increases in the federal funds rate. For me, the necessary conditions for further increases are, unsurprisingly, continued GDP growth at or above potential, continued progress in the labor market, and inflation moving back to 2 percent over time. I would like to see unemployment decline well below 5 percent, the current Tealbook estimate of the natural rate, and I'd like to see, in that context, what happens to wages and to labor force participation.

My baseline expectation is that those conditions will be fulfilled in the course of 2016. If they are, I will support further rate increases, and I can see one or two this year—again, if those conditions are fulfilled. But if one or more of the conditions are not fulfilled or if obvious global risks emerge, in my view, it may be appropriate to pause. I don't see the Committee as needing to be in a hurry to raise rates. We have below-target inflation and an apparent weakening in both demand and job creation. I do not feel a pressing need to take steps to slow the economy further.

It is plausible to me that those conditions will be fulfilled at the time of the September meeting. Two strong payroll reports, combined with decent demand, could well suffice. The market is currently pricing in a modest probability of an increase by the September meeting, and, in fact, the market has been moving that probability up materially in response to incoming data. If the two payroll reports are strong, then the market will likely move substantially in the direction of an increase, and the rest of that gap could be closed through communication.

The question for today is whether to send a strong signal through the statement that an increase is likely in September. I would not do that, because I actually don't know whether a rate increase in September is likely to be a good idea. We gave a strong signal earlier in the year but were whipsawed by incoming data, and I'm reluctant to send a strong signal, as is contained in alternative C, paragraph 3'. If the data do support a September increase, it will be straightforward to bring markets into better alignment with that event. And if we send a strong signal now but the data don't cooperate, then I think we are in a position of climbing down again, at real risk to the Committee's credibility.

So I think we should continue to say clearly that the path of tightening is likely to be gradual and dependent on the momentum of the economy, and we should let the data do the talking. I support alternative B as written and am happy to accept the amendment on residential investment. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Mester.

MS. MESTER. Thank you, Madam Chair. In view of my outlook and the risks, I believe a gradual upward path of interest rates remains appropriate. We've made progress on both of our monetary policy goals, and various forecasts and optimal control exercises indicate that, to continue to make progress on our goals, it's appropriate that we gradually increase the funds rate.

In my view, from the standpoint of what monetary policy can do, we have met our maximum-employment goal. Employment growth is projected to be sufficient to lead to further reductions in the unemployment rate and other measures of underutilization of labor. Both anecdotal reports and data suggest wages are beginning to accelerate, although the pace of acceleration is likely to be relatively slow as long as productivity growth remains low. I don't want to underestimate the problems many people continue to have in the labor market. Technological advances and globalization are changing the nature of available jobs and the skill sets needed to perform those jobs. I do believe that government policies and programs and private–public partnerships should be brought to bear to help workers develop skills to reenter and stay in the workforce. I just don't see how monetary policy is a means to do that, and it seems like a disservice to the very people it's intended to help to suggest otherwise.

Although inflation remains below our 2 percent goal, we've made progress. I expect inflation to move back gradually to our goal, consistent with my outlook that economic growth will continue to be at or slightly above trend, that the unemployment rate will fall below estimates of its longer-run trend, and that inflation expectations have been and will continue to be reasonably stable. Of course, there will be some ups and downs along that path, depending on the trajectory of oil prices and the dollar. But I think continued gradual progress is a reasonable forecast.

I believe risks associated with the outlook have decreased since our June meeting in terms of both those attending the labor market and the reaction to the U.K. referendum, which have subsided. If financial stresses in the European banking system build up significantly in the future, then we can address the implications for the U.S. economy at that time. I don't think holding policy rates low in the United States can mitigate that sort of risk or reduce the

probability that this type of event will occur. Indeed, by keeping rates lower for longer than appropriate, we could be exacerbating problems in the banking system by encouraging even greater search-for-yield behavior in light of lower net interest income.

Putting all of this together, I believe there's a strong case for raising the funds rate. We are not "behind the curve" yet, but if we continue to wait for every piece of data to line up before we act, we will surely be "behind the curve." And if we refrain from acting even though we are making progress toward both of our policy goals, we're going to confuse the public and reduce our own credibility. At this point, I think we have the luxury of taking the next step and then taking time to assess conditions before moving again. This is consistent with our anticipated gradual path. It's also consistent with our being data dependent in the right way. By that, I mean it allows us to accumulate enough data so that we can better assess whether the medium-run outlook has changed, rather than being "jerked around" by every monthly data release. Assuming there's no material change in the medium-run outlook between now and September, whether we raise rates today or do it in September is immaterial from an economic standpoint. In September we will have a new set of SEP numbers, the first estimate of second-quarter GDP, two more job reports, and opportunities for further communication so that an action isn't as much of a surprise as one would be today.

Regarding today's statement, in paragraph 1, I think the characterization of inflation should acknowledge that inflation has risen this year, and that we've made progress on our inflation goal. I prefer the inflation language in alternative C to that in alternative B. I prefer the alternative language regarding residential investment that President Williams put on the table today. I don't think there's been a material change in our housing outlook since June. If you wanted to leave in a reference to residential investment, I suggest using language closer to what

we used in June and just simply say “Since the beginning of the year, the housing sector has improved.” In paragraph 2, I believe it is very important that we indicate that near-term risks have diminished, as now proposed in alternative B. I read the rest of the statement as not giving any indication of what we will do in September. Regardless of market expectations, which may remain low because of our own communications, if the outlook for the economy is largely unchanged from what we see today, with employment growth continuing to be at or above the estimates needed to put further downward pressure on the unemployment rate and the forecast that inflation returns to our goal over time still intact, I will expect us to increase the funds rate in September. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Brainard.

MS. BRAINARD. Thank you, Madam Chair. I would want to get additional readings on the underlying momentum of the economy before making a call on whether it’s appropriate to adjust policy. In considering whether it will be appropriate to adjust policy in coming meetings, it will be important to assess the distance to our policy goals, the speed at which we’re approaching them, the balance of risks, and our ability to adjust course if the economy evolves differently than we anticipate.

The recent pace of progress toward full employment appears to have downshifted materially, and there are few, if any, signs of strong wage pressures. As payroll gains have moderated, the unemployment rate has essentially moved sideways. Although there are some indications that the economy is approaching full employment, estimates of full employment are highly imprecise, and this has been exacerbated by the deep damage wrought by the Great Recession. Moreover, some indicators, such as the prime-age employment-to-population ratio and the number working part time for economic reasons, suggest there is still room to go.

Importantly, both headline and core inflation remain notably below 2 percent, and core inflation has been below our target for 88 out of the past 92 months. To the extent that inflation expectations show signs of becoming less well anchored, survey- and market-based measures suggest we should be concerned about unanchoring not to the upside but to the downside.

If we were to suggest through our policy actions that we are content that the current level of resource utilization is consistent with attainment of our dual mandate, our commitment to a symmetric inflation target around 2 percent could be called into doubt, and inflation expectations could suffer. While it seems likely that further improvement in economic momentum and resource utilization will likely be necessary in order to reach our policy goals, more data will help us assess just how much. In light of the recent slowing in economic momentum, with the economy likely still somewhat short of reaching our goals, the downward tilt of risks to real activity and inflation from abroad counsels a prudent approach.

We should carefully weigh the risks of moving to tighten policy prematurely against the risks of moving too slowly. If we take a patient approach and policy does not adjust as rapidly as it should and inflationary pressures build more quickly than we anticipate, we still have well-understood conventional tools and plenty of space to address this contingency. Moreover, upwardly anchored expectations and weakness in external demand, along with what I believe is a persistently lower neutral rate, will likely limit the steepness of that required policy response. On the other hand, if we adjust policy in the hope that favorable data will subsequently materialize and they do not, the economy will become more vulnerable to adverse shocks, even fairly moderate ones. The space we have to address such a contingency using conventional tools is extremely limited, and the policy options using nonconventional tools are not without complications. As a result, we could risk a prolonged period in which inflation and, potentially,

employment fall short of our goals. In short, I would need to see some combination of greater momentum in economic activity and progress on inflation before feeling confident that the economy would both warrant a tightening in policy and remain resilient to possible negative shocks from abroad that we discussed yesterday.

For those reasons, it's important that the statement does not provide a soft commitment to a policy adjustment in the near term, both to avoid muddying the waters on data dependence and to avoid any risk to our credibility if we seem to change course subsequently. We'll be receiving important data before our next meeting: two employment reports, two reports on PCE inflation, the first report on Q2 GDP, revisions to price, compensation, and spending data in previous quarters, and important data on recent changes in labor compensation. We'll also get a better sense of the resilience of euro-area banks and insights about the shape of any possible response by Italy. These will provide valuable insights about how much momentum has slowed, whether it's slowed, how quickly resource constraints are tightening, and how key risks are evolving.

The intermeeting data may indeed be consistent with a need for another step-up in the federal funds rate in coming months, or, of course, they may not. In view of the uncertainty, there's a reasonable probability that the incoming data would not be consistent with a policy adjustment in September. A soft lean in today's statement would then be quite problematic insofar as it might constrain our decisions in September. It would be better to leave decisionmaking in September unconstrained. As Governor Powell suggested, if we see the data coming in stronger, the market itself is likely to begin to adjust its expectations, and there'll be ample opportunity to communicate how the Committee is likely to react to those developments through the minutes and the Chair's communications.

Finally, I do have a suggestion in response to President Williams's suggestion. If we do decide to follow his recommendation to delete the reference to residential investment being soft, it allows us to downgrade, I think, our description of business investment, which I would prefer to see described as weak, reflecting that it has indeed been one of the troubling spots in the economy for past quarters. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you, Madam Chair. I support alternative B. In terms of language, when I think about paragraph 1, I think it is about us talking not about all of the things that are happening in the U.S. economy, but talking about the things that are happening in the U.S. economy that we think are important and that weigh on the outlook and then, subsequently, weigh on our actions. If you use those criteria, it seems to me that the reference to residential investment doesn't really fit. We're not really evaluating there was a lot of signal in the recent softness in residential investment because we think it's erratic and because it's following very strong residential investment in the first quarter. So I very much support deleting that reference.

But with respect to the sentence "Job gains were strong in June following weak growth in May," I think those are important things that we want to stress, because we had quite a bit of anxiety about the weakness in employment in May and we took quite a bit of solace from the rebound in June. So, by that metric, I think we should be highlighting that. I agree with President Williams that we don't want to highlight monthly data a lot in paragraph 1, but when it's particularly important and when it really weighs on our evaluation of the economic data, I think it's appropriate.

There are two things I want to talk about more broadly. First, why are expectations about U.S. short-term rates so far below what we actually expect to do over the next year to 18 months? Second, is that a problem, and, if so, what should we do about it?

When I look at the rate expectations out through 2018, I'm amazed at how flat the interest rate curve is. I think there are a number of reasons to explain the shift, and that should affect our view of how we think about this. First, people's assessments of the neutral real short-term rate have declined because economic growth has persistently fallen short of expectations. If you look at the U.S. economy, it's averaged only a 2.1 percent annual growth rate over the past seven years, and, over the past year, it's actually grown even weaker than that. So I think it's been much harder to sustain the view that the neutral real short-term rate is close to or will soon be close to its historical level of around 2 percent. As I've said for a long time, I think we need to reevaluate the efficacy of the Taylor-rule types of formulations.

The estimates of the current neutral real short-term rate obtained from many of the DSGE models within the Federal Reserve System are quite interesting. Most of those estimates are clustered close to zero, and that seems to me a much more reasonable estimate of what the neutral short-term rate likely is at this time. If that's right, it implies there's only a small gap between the actual real short-term rate of about minus 1 percent and the neutral real short-term rate. So it implies that, while U.S. monetary policy is accommodative, it's only mildly so. And I think that also has implications for how fast we actually have to move in terms of raising short-term interest rates.

In addition, as I discussed at the June meeting, I think many have come to the view that this idea that the headwinds from the crisis that are depressing the neutral short-term rate are going to dissipate in the near future may be becoming a less compelling story for the simple

reason that if the headwinds haven't dissipated to a meaningful degree after seven years, what's going to happen in the next year or two that is going to, all of a sudden, necessarily cause them to diminish? I think that some of the headwinds, at least, are going to prove to be much more persistent. The one that I think is most noteworthy is the reduced availability of mortgage financing for those with lower credit scores. That seems to me likely to linger for a long time, because I think lenders now appreciate that home prices can decline significantly, and, thus, that they can't rely on the value of the housing collateral to secure their mortgage loans to the extent they thought they could. So now the credit quality of the borrower really matters in terms of that mortgage lending decision. I think this is something that's just going to be with us for a very long time.

A second reason for the downward adjustment in U.S. interest rate expectations is that U.S. financial market conditions depend in part on the stance of our monetary policy relative to monetary policies abroad. So if the economic outlook abroad deteriorates, that causes foreign countries to pursue a more accommodative set of monetary policies, and that means we may also have to adjust our own monetary policy path. If we don't adjust our path, then the dollar would likely appreciate because of higher relative U.S. interest rates, and this could result in an undesired tightening in U.S. financial conditions. What we've seen is that the economic outlook abroad has been disappointing, so the forward rate paths in Europe and Japan have fallen considerably this year. If we had actually stayed on our December 2015 SEP path, then the U.S. dollar would have likely appreciated much more significantly. So I think some of what we're seeing is, the U.S. rate path is coming down in tandem with the foreign interest rate path, and, as a consequence of that, the dollar has appreciated only modestly.

The second question I wanted to talk about is whether this is a problem and, if so, what we should do about it. I think the answer depends in large part on whether one judges that the current set of financial conditions is too accommodative relative to what we need to achieve our objectives. If we look at the various financial conditions indicators, financial conditions now appear to be a bit easier than they were before our December decision to increase our federal funds rate target. Although the dollar is slightly stronger, this has been more than offset by lower long-term yields and higher equity prices. Now, this easing in financial conditions would seem to argue for a rate hike, but, against this, the global outlook has deteriorated, and we haven't really upgraded our own forecast of economic growth or inflation. So, in other words, one could also argue that it seems that we need a more accommodative set of financial conditions in order to best achieve our objectives. I think that's really what the argument is about. If it's true that we need an easier set of financial market conditions, then we probably should be patient. So that's really the tension here.

I'm really not sure which view is the right one. Because I don't know which view is the right one, I don't want to foreshadow what we're going to do in September until I can actually be a little bit more certain about that outcome. If we do get closer to the September meeting and we think we do want to move but market expectations are not there, I do think there are plenty of opportunities to communicate in order to alter those expectations prior to that meeting. I don't see the need to do more at this meeting than what alternative B does. The near-term risks to the outlook have diminished. I think it actually will push expectations about September upward. I have no idea by how much. I would judge it's probably a little rather than a lot, and one could argue that somewhat different language could have a bigger effect. But I think that, directionally, I'd be very surprised if expectations for September don't move up a little bit with

that language, because people are going to look at it and say, “Despite the Brexit vote, which is a negative, the Federal Reserve has decided that the near-term risks have diminished.” And I think they’re going to take it to some extent as saying that the employment news and the favorable market reaction following the Brexit vote trump the Brexit vote itself.

Finally, in terms of the language, as I said, I would favor deleting the “residential investment” language and making no other changes to the statement. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Okay. Let me start with the smaller issues before commenting on the larger ones. Why don’t we start with residential investment? I’ve heard considerable support for changing the language there, and one possibility is simply to delete the language about residential investment and to say nothing. I did hear President Mester suggest that another possibility would simply be to say “Since the beginning of the year, the housing sector has improved.” And, frankly, I’m open to either possibility. I suppose the simpler thing is just to delete all reference to it. Would most of you be comfortable doing that—just deleting all reference to it?

VICE CHAIRMAN DUDLEY. I think there was a pretty strong consensus on that side.

CHAIR YELLEN. To just delete it completely?

VICE CHAIRMAN DUDLEY. Among the people who spoke, yes.

CHAIR YELLEN. Okay. So I suggest we delete it. The sentence would read “Household spending has been growing strongly, but business fixed investment has been soft.”

The second suggestion of President Williams concerned the sentence “Job gains were strong in June following weak growth in May.” I did hear a little bit of support for President Williams’s proposal to delete that as well as some counterarguments. I’ll say that, for my own part, normally I don’t like to focus on a lot of up-and-down in the data and prefer instead to focus

on longer-term trends, which are highlighted in the sentence that follows that. But I agree with the Vice Chairman that, on this particular occasion, we strongly emphasized our concern about the May reading. And to say that weak reading was completely reversed, essentially, in June is giving a clear sense that we're now discounting that and taking a stronger view. On this occasion, I think it's important, but if I hear a groundswell of sentiment for getting rid of it, I'm open to it. President Kaplan.

MR. KAPLAN. The reason I agreed is, my fear is that we know that each of these monthly data series is subject to revision, and sometimes it's a large revision. As we go forward, as we have volatility in monthly numbers, I don't want the public to think our reaction function is to overreact or underreact to any month. And I do think the sentence that follows does the trick by focusing more on smoothing. I'm more worried about the public understanding our reaction function, and, to me, citing individual months gives them a somewhat misleading picture of our reaction function. That's the reason I was in favor of deleting it.

CHAIR YELLEN. I guess, in general, I agree with that, and typically we do not cite "This thing went up last month, and it fell." When such things happen—and I guess residential investment is arguably a case in point—we don't talk about it, or we talk about longer-term trends. So I think this is an unusual situation, but, to my mind, it's one in which we focused so much attention on our concern about the May employment report that it is a slightly different situation. President Bullard.

MR. BULLARD. Thank you, Madam Chair. I think President Kaplan brings up a good point about revisions. This could be changed in the future. And I also think it's unnecessary. The next sentence says "On balance, payrolls . . .," and everyone will know exactly what we're talking about without having to have the "upsey downsey" sentence in there. So I don't think it

helps us, I don't think it does anything for us, and the "On balance" sentence takes care of it. So I would agree with President Williams on this.

CHAIR YELLEN. President Mester.

MS. MESTER. You know I've argued that we should take a longer-term view. My fear is that if we don't put this in, we're not taking a stand that 287,000 jobs per month is strong job growth. And I worry that if we take that out, people are going to think that an increase of 287,000 in jobs is kind of what we're expecting each time.

VICE CHAIRMAN DUDLEY. I think it would make the statement softer—

PRESIDENT ROSENGREN. To take it out.

VICE CHAIRMAN DUDLEY. —to take it out, frankly. Because by highlighting the job gains, what you're doing is saying that you're taking quite a bit of signal from it, which I think we are.

PRESIDENT ROSENGREN. I agree with that.

CHAIR YELLEN. Absolutely. I agree. President Harker.

MR. HARKER. One possibility, without naming months, is just to delete that sentence, get rid of "On balance," and say "Job gains, payrolls, and other labor market indicators," et cetera. So it's recognizing the job gains without actually explicitly naming the month.

VICE CHAIRMAN DUDLEY. We're already saying that by the word "payrolls," though, aren't we, President Harker?

MR. HARKER. I worry about naming the months, especially when you consider revisions.

MR. FISCHER. I don't think we should worry about naming this month. We had a deviation of about three standard deviations from what was expected, and everybody noticed it,

and we used it as a reason why we weren't raising rates—I don't know quite how we phrased it—so I think we should at least mention it.

CHAIR YELLEN. It was an important factor in our changing view, and this is communicating that we're now discounting what we said about our concerns at the June meeting. Okay. I realize there are people on both sides of this. My suggestion is that we leave that as is, and let me turn to the larger issue of September. I certainly heard many of you around the table express the view that there is a strong case, in view of how the economy has behaved, for moving rates gradually up over time; that September certainly should be on the table as an option; and that you would want to see nothing in the statement or in our communications over the next couple of months that would in any way tie our hands in September if we interpret that the data are appropriate to move. Even among those of you who are more reluctant and skeptical that a move in September will be appropriate and that the data will support it, I've also heard an openness on your part to looking at the incoming data and evaluating whether a move in September is appropriate, and I completely share that view.

I can easily imagine a data flow—President Lockhart set out some examples—that would leave me feeling that we should move in September. I absolutely agree that it should be an open option. We should do nothing to take September off the table. And as time passes and the data flow comes in, if our sense is that September is appropriate, then our communication should help markets to understand our evolving views.

Now, frankly, my interpretation of what's in alternative B—I think both the changes in paragraph 1 and the new red sentence in paragraph 2 do indicate that September is on the table, and that it will be interpreted that way. I'm not perfect, either, at predicting market reaction to our statements, but it is my sense that, for example, no changes at all are really expected in

paragraph 2 by most observers. And for us to say that near-term risks have diminished, I think, will be noticed and taken as a signal not of any commitment to move, but as a sense that we're more comfortable with the data flow.

Many of you mentioned my speech at the Jackson Hole symposium. I have a good opportunity there to comment on the incoming data flow. If we're feeling that September looks like the time we should move, first of all, I think the data flow will move markets. We've seen that in the past. A number of you have commented on it. I would expect that. And I promise that at Jackson Hole, if that looks appropriate, I will say something that will confirm that sentiment or move it along.

I am very worried—a number of you have commented on this—that we have in the past signaled we're just on the verge of moving, and then something happens and we don't move. I do not regret our decisions in various meetings not to move. I think there were good reasons not to move. But constantly suggesting we're on the verge of moving and then not doing so is harming our credibility. I would prefer to be more in a wait-and-see posture, in which every meeting, particularly September, is “live,” and we will make our decision on the basis of the data flow and not go too far.

And the language that's in alternative C, I think, is true. You know, the case in favor of raising the funds rate I believe has increased. I wouldn't take any issue with the truthfulness of that statement, but it would be taken as an extremely strong signal, and, to my mind, it's not appropriate at this point. I've heard a lot of sentiment in the direction of alternative C, but I also have heard a large number of people who feel pretty strongly that alternative B is far enough for today, so I would propose that we stick with the language in alternative B.

Let me say just one other thing before we call for a vote, and that is that both today and at our June meeting I heard a number of you say that our statement and communications aren't as effective as they ought to be. In particular, over the past year, the pace of tightening has been noticeably slower than we anticipated in December when we first raised rates. That's led to the cynical conclusion in some quarters that we're always looking for an excuse, and we'll always find an excuse, not to raise rates. I'm wondering, in light of that, whether it's helpful to keep emphasizing in our statement that the funds rate is likely to rise gradually over the next two or three years. And I think we do need to think hard about our forward guidance and whether we could change the language so that it provides a somewhat better sense of what our actual reaction function is and what it means when we say that our actions are data dependent. I think that in coming meetings, this is something that we need to consider and discuss, and I will try to structure some conversation on that. But for today, I would like to propose that we vote on alternative B as written, with the one change pertaining to residential investment that we discussed.

MR. MADIGAN. Thank you, Madam Chair. This vote will be on the statement associated with alternative B, as on pages 6 and 7 of Thomas's handout, with the change to the fourth sentence that the Chair indicated. This vote will also cover the directive to the Desk as included in the implementation note on page 10 of Thomas's package.

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

MR. MADIGAN. Thank you.

CHAIR YELLEN. Okay. Thanks, everybody, for a good meeting. Our next meeting is Tuesday and Wednesday, September 20 and 21. For those of you who will be around, there will be a buffet lunch starting at 11:00.

END OF MEETING