**Meeting of the Federal Open Market Committee on
July 28–29, 2015**

A meeting of the Federal Open Market Committee was held in the offices of the Board of Governors of the Federal Reserve System in Washington, D.C., on Tuesday, July 28, 2015, at 10:30 a.m. and continued on Wednesday, July 29, 2015, at 9:00 a.m. Those present were the following:

Janet L. Yellen, Chair
William C. Dudley, Vice Chairman
Lael Brainard
Charles L. Evans
Stanley Fischer
Jeffrey M. Lacker
Dennis P. Lockhart
Jerome H. Powell
Daniel K. Tarullo
John C. Williams

James Bullard, Esther L. George, Loretta J. Mester, Eric Rosengren, and Michael Strine, Alternate Members of the Federal Open Market Committee

Patrick Harker and Narayana Kocherlakota, Presidents of the Federal Reserve Banks of Philadelphia and Minneapolis, respectively

Helen E. Holcomb, First Vice President, Federal Reserve Bank of Dallas

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

David Altig, Thomas A. Connors, Michael P. Leahy, William R. Nelson, Daniel G. Sullivan, and William Wascher, Associate Economists

Simon Potter, Manager, System Open Market Account

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

Robert deV. Frierson,[1] Secretary of the Board, Office of the Secretary, Board of Governors

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

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

James A. Clouse and Stephen A. Meyer, Deputy Directors, Division of Monetary Affairs, Board of Governors

Andreas Lehnert, Deputy Director, Office of Financial Stability Policy and Research, 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

David E. Lebow, Senior Associate Director, Division of Research and Statistics, Board of Governors

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

Ellen E. Meade[2] and Joyce K. Zickler, Senior Advisers, Division of Monetary Affairs, Board of Governors; Jeremy B. Rudd, Senior Adviser, Division of Research and Statistics, Board of Governors

Fabio M. Natalucci,[3] Associate Director, Division of Monetary Affairs, Board of Governors

Jane E. Ihrig,[2] Deputy Associate Director, Division of Monetary Affairs, Board of Governors

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[1] Attended the joint session of the Federal Open Market Committee and the Board of Governors.
[2] Attended through the discussion on potential enhancements to the Summary of Economic Projections.
[3] Attended the discussion of the economic and financial situation through the close of the meeting.

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

Burcu Duygan-Bump, Adviser, Division of Monetary Affairs, Board of Governors

Penelope A. Beattie,[1] Assistant to the Secretary, Office of the Secretary, Board of Governors

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

Katie Ross,[1] Manager, Office of the Secretary, Board of Governors

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

Etienne Gagnon, Senior Economist, Division of Monetary Affairs, Board of Governors

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

Jeff Fuhrer, Executive Vice President, Federal Reserve Bank of Boston

Troy Davig, Michael Dotsey, Evan F. Koenig, Julie Ann Remache, Samuel Schulhofer-Wohl, and Ellis W. Tallman, Senior Vice Presidents, Federal Reserve Banks of Kansas City, Philadelphia, Dallas, New York, Minneapolis, and Cleveland, respectively

Todd E. Clark,[2] Ayşegül Şahin, Mark Spiegel, and Stephen Williamson, Vice Presidents, Federal Reserve Banks of Cleveland, New York, San Francisco, and St. Louis, respectively

Matthew Nemeth,[4] Assistant Vice President, Federal Reserve Bank of New York

Robert L. Hetzel and Carlo Rosa, Senior Economists, Federal Reserve Banks of Richmond and New York, respectively

[4] Attended through the discussion on System Open Market Account reinvestment policy.

Transcript of the Federal Open Market Committee Meeting on July 28–29, 2015

July 28 Session

CHAIR YELLEN. Good morning, everyone. Let's get started. I'd like to once again welcome First Vice President Holcomb, who will be representing the Dallas District, as well as Michael Strine, who is back for his second meeting, but this time as first vice president of the Federal Reserve Bank of New York, and is an alternate on this Committee. I'd also like to welcome Patrick Harker to his first FOMC meeting. I think everybody knows that earlier this month, Pat became president and CEO of the Federal Reserve Bank of Philadelphia. He brings with him a distinguished record in academic research, many years of experience leading large and important institutions, and a long history of service on a wide range of corporate and nonprofit boards, including the board of the Federal Reserve Bank of Philadelphia starting in 2012. Let me just say, on behalf of everyone here, we're all looking forward to working with you in the years ahead.

MR. HARKER. Thank you, Madam Chair.

CHAIR YELLEN. Now, turning to our agenda, the first two items today are going to be considered in a joint meeting of the Board of Governors and the FOMC. A Board vote is going to be needed to close the meeting. So do I have a motion to close the Board meeting?

MR. FISCHER. So moved.

CHAIR YELLEN. Thank you. Without objection. Our first item on the agenda is financial developments and open market operations, and Simon is going to begin.

MR. POTTER.[1] Thank you, Madam Chair. Lorie and I will again be splitting the Desk briefing in two parts: I will first discuss financial market developments, and Lorie will then discuss Desk operations and balance sheet developments.

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

The intermeeting period was characterized by pronounced shifts in risk sentiment and bouts of volatility in some overseas markets largely driven by events in Greece and China. However, volatility in domestic financial markets was not unusually large.

The top-left panel of your first exhibit shows important events over the intermeeting period, marked with dashed lines. The June FOMC statement and SEP release, line 1, resulted in a slight decline in Treasury yields and was largely overshadowed by developments in Greece and China, lines 2 through 5. On net, both equity prices and longer-dated Treasury yields were relatively little changed over the period.

Treasury yields generally fell on days featuring FOMC communications or top-tier domestic economic data releases, as shown in the top-right panel. Market participants highlighted the downward shift in the June SEP "dots" and below-expectations inflation, employment, and retail sales data as main factors driving the declines. In contrast, yields increased, on net, other than in these days, as captured by the "other" category. This category includes days when developments abroad were the main focus.

Domestic monetary policy communications and data, along with overseas developments, shifted the perceived balance of risks toward a slightly later liftoff. While, on average, respondents to the Desk's dealer and buy-side surveys attach the highest odds to liftoff occurring in September, as shown in the middle-left panel, the average probability assigned to this outcome declined slightly from the June surveys. The associated increase in the odds placed on a later liftoff was spread roughly evenly across future meetings, and the average probability of liftoff is now more than 20 percent for both the December meeting and for meetings thereafter. A small number of Desk survey respondents noted that the potential for strained year-end liquidity conditions might make the Committee reluctant to lift off in December.

The survey probability of a September liftoff is generally in line with probabilities implied by market prices, shown in the middle-right panel. These probabilities, derived from federal funds futures contracts, declined following the June FOMC events and were then, on net, little changed over the remainder of the period. Of course, backing out physical probabilities from market prices is a highly imperfect endeavor and requires numerous assumptions. In addition, one now needs to make an assumption about where market participants believe the effective federal funds rate will trade in the target range. The dark blue line in the panel uses the median expectation of 10 basis points above the bottom of the range from a question in the Desk surveys, while the light blue lines use the interquartile range of these expectations. The shaded region is based on the full set of responses to the Desk surveys, reflecting a possible range of probabilities that may be drawn from market prices.

Market participants generally continue to believe the pace of tightening will be gradual, in line with recent communications from Federal Reserve officials. Thomas will discuss this more in his briefing.

One factor contributing to the gradual expected pace of tightening has been subdued readings of realized inflation. Market-based measures of forward inflation remain notably below longer-run historical averages, as shown in the bottom-left panel, though they have increased somewhat since the start of the year as energy prices bottomed out and inflation readings stabilized. Over this intermeeting period, forward inflation measures remained relatively steady despite a decline of 14 percent in front-month Brent crude oil futures, in contrast to the highly correlated moves seen over the past year. Longer-dated oil futures also declined. The recent drop in oil prices appears to have been partly driven both by higher-than-expected supply from Saudi Arabia and Iraq and by expectations for increased supply from Iran over the longer run after an agreement with major international powers cleared the way for sanctions to be lifted. The decline in oil prices caused high-yield corporate credit spreads for energy-related firms to increase over the period. Credit spreads outside the high-yield energy sector also widened somewhat.

Yields on benchmark Puerto Rico general obligation bonds also rose sharply, as shown in the bottom-right panel. This occurred after the Puerto Rican government indicated that its public debt burden was unsustainable and that significant concessions from its creditors would be necessary. The panel also shows that spillover to other municipal markets has thus far been limited. As discussed in one of your boxes in Tealbook A, risks associated with Puerto Rico at present appear manageable but warrant continued monitoring.

Turning to your next exhibit, the top-left panel shows that the DXY dollar index increased 2 percent during the period. The dollar initially appreciated as investors focused on risks from the euro area and China and, more recently, from the ongoing backdrop of monetary policy divergence across major economies.

Dollar strength and concerns over Chinese economic growth reportedly contributed to declines in industrial metals prices and commodity-linked currencies over the period. The Bloomberg industrial metals index fell nearly 8 percent and developed economy commodity-sensitive currencies, including the Australian and Canadian dollars as well as the Norwegian krone, depreciated an average of 6 percent against the dollar. Some market participants suggested that commodity price declines for industrial metals were exacerbated by the sharp fall in Chinese equity prices through a financing linkage. These commodities had reportedly been used by some as collateral to obtain margin financing and were subsequently sold to meet margin calls amid the equity market declines.

The Shanghai Composite index declined roughly 17 percent over the period, as shown in the top-right panel, and, after taking into account the past two days, is down almost 30 percent from its peak. This peak represented a 150 percent increase since last July. As I discussed at the June meeting, conventional easing measures by the

PBOC against a backdrop of slowing mainland economic growth were cited as the primary driver behind the equity market increase over the past 12 months. Such easing measures, denoted by the gold diamonds in the chart, included cuts to benchmark interest rates and targeted required reserve ratios. These measures supported the already prevalent use of margin and increase in equity market valuations. However, this dynamic appeared to reverse, and substantial additional conventional easing measures by the PBOC failed to arrest a rapid decline in stock prices in late June.

In response, Chinese officials implemented an unprecedented array of measures to halt the sharp correction over the intermeeting period. Authorities announced new targeted initiatives on a nearly daily basis, including easing margin trading and collateral requirements, establishing an official stabilization fund to support the equity market, and suspending IPOs. In addition, many firms requested that trading in their shares be halted as a result of the volatility. Market participants noted these measures increased "moral hazard" and suggested they may undermine previous market reform efforts.

Because it is only a small subset of the Chinese population that invests in mainland equities, market participants believe the correction is unlikely to have a material direct effect on the Chinese economic growth outlook or on asset prices outside China. However, there were a few days over the intermeeting period when negative risk sentiment from Chinese equity price declines spilled over into major global financial markets, especially to other Asian markets. Some market participants speculated that this spillover may have reflected concern about a broader loss of control in other parts of the Chinese economy or financial system, in view of the difficulty mainland authorities had stabilizing their equity markets.

The effects of the Chinese equity market declines were also evident in offshore renminbi currency markets, as some suggested policymakers could also weaken the currency to support domestic export-oriented firms. Recall that the renminbi has been appreciating, along with the dollar, against most other currencies for around one year. Offshore forward prices and currency option-implied skew reflected increased demand to protect against renminbi depreciation after the peak in Chinese equity prices, as shown in the middle-left panel. However, these moves were small compared with the changes seen in late 2014 and early 2015, when Chinese officials unexpectedly cut benchmark interest rates and reportedly intervened to stem the extent of the currency depreciation. Despite the recent moves in the offshore market and large stock market fluctuations, the onshore renminbi remained remarkably stable.

The sharp Chinese equity market moves resulted in an average intraday trading range that was more than 4 standard deviations above its typical level since 2000, as shown in the middle-right panel. Overall, the recent movements in Chinese equity prices refocused market attention toward risks emanating from the mainland. Many participants suggested that the risk of a sharp slowdown in China was of much greater concern than risks stemming from the situation in Greece. Steve Kamin will discuss developments in both China and Greece in his briefing.

Greek developments contributed to elevated realized volatility in euro-area markets, with the intraday trading range of the Italian 10-year yield increasing to its highest level since mid-2013, also shown in the middle-right panel. Volatility early in the period was due to uncertainty about the implications of an unraveling of Greek debt negotiations and the "no" vote on the Greek referendum. The uncertainty reduced substantially as Greece and its creditors agreed to a temporary bailout package.

Despite the drama, the knock-on effects across European and global financial markets were relatively contained. As shown in the bottom-left panel, Greek 10-year debt spreads to Germany widened out substantially, but other peripheral spreads were comparatively little changed, especially relative to their widening in 2011 and 2012. Contacts attributed the relatively limited contagion to strengthened financial backstops for other peripheral economies and reduced exposure of core euro-area banks to Greece. In addition, market participants cited expectations that the ECB would use its purchase programs to lean against any significant widening in euro-area peripheral debt spreads or tightening in euro-area financial conditions should the Greek situation deteriorate. Increased uncertainty in the euro area also had a very limited effect on domestic bank asset prices, whose behavior Nellie will discuss in her briefing.

Consistent with the relatively muted response in broader asset prices, the euro has only modestly depreciated 2 percent since the Greek referendum was called. Other asset prices sensitive to the macro outlook in Europe, such as the five-year, five-year forward inflation swap rate, were also little influenced by Greek developments, as shown in the bottom-right panel, and remain higher since ECB asset purchases were announced. The passage of significant Greek event risks has shifted market attention back to underlying European economic fundamentals, including the fact that forward inflation compensation measures still remain below the ECB's 2 percent objective. This has caused many to refocus on the theme of the policy divergence consisting of the ECB's continued easing and the Federal Reserve's approaching normalization. Lorie will now continue the Desk briefing.

MS. LOGAN. Thank you, Simon. I will start on exhibit 3 with an update on the swap lines, as we have seen a modest rise in demand from the ECB related to the Greek risk events that Simon discussed.

As shown in the top-left panel, demand at the ECB's seven-day dollar auctions reached about $660 million in mid-July. Market pricing indicators, however, show no evidence of broad disruption in offshore dollar funding markets. And even if a resurgence of the Greek crisis were to generate more pronounced spillovers in euro-area markets, demand is not likely to return to the much higher levels seen in earlier phases of stress. This is in part due to the financial backstops that now exist in the euro area, but also because euro-area banks have reduced their balance sheets and the associated need for dollar funding compared with previous years. In terms of demand from the BOJ, take-up at the BOJ dollar auctions has been minimal, with the exception of some draws in the seven-day auctions that span quarter-end dates, when market pricing for U.S. dollar funding via one-week FX swaps has notably exceeded the BOJ's auction rate.

As shown in the top-right panel, we also continue to see quarter-end volatility in U.S. money market rates, mainly reflecting banks shrinking their balance sheets or requiring a higher return for intermediation in response to incentives arising from regulation. At the June quarter-end, the upward pressure on interdealer repo rates and downward pressure on unsecured rates were broadly consistent with expectations. Outside quarter-end, secured and unsecured rates were generally stable over the period, with the ON RRPs continuing to form a soft floor beneath money market rates.

Reverse repo operations conducted by the Desk proceeded smoothly over the intermeeting period. In addition to its overnight operation, the Desk conducted two term operations over the June quarter-end, the results of which are detailed in your middle-left panel. The results were generally as expected, with each of the two offerings modestly oversubscribed. The maximum offering rate for the June quarter-end term operations—at 3 basis points above the ON RRP rate—was lower than the 5 basis points over the ON RRP rate that was offered in March. However, the tenors of the term operations were shorter, and the attractiveness of the shorter tenors appeared to offset any effect of the lower rate. These results could suggest that quarter-end term RRP participation was primarily driven by counterparties' desire to secure investment over the quarter-end, with the desire for incremental yield playing a secondary role. While the Desk's term operations were fully subscribed, ample capacity remained in the overnight operation over the June quarter-end date.

Recall that our communication at the time of the June quarter-end term operations took a different approach than in prior quarter-ends in that it separated the announcement of the term RRP offering size and tenor, which was released following the April minutes, from information on the offering rate and other details, which were released following the June FOMC meeting. This strategy allowed us to retain some flexibility to adjust the specific parameters of the operations in case the Committee decided to lift off at the June meeting. This communications change caused little market reaction, and we propose continuing with this practice for the September quarter-end.

As summarized in the middle-right panel, we intend to release a statement shortly after the July minutes announcing a plan to offer at least $200 billion in term RRPs at tenors of seven and two days in addition to the $300 billion in ON RRP capacity over the September quarter-end. Further, the statement would note that the Desk will release the remaining details of the term RRP operations after the September FOMC event and shortly ahead of quarter-end. We would then come back to the Committee at or shortly after the September meeting with a recommendation for the exact size and maximum offering rate for each operation.

Looking ahead to other upcoming operational testing, the staff recommends that a series of TDF test operations be held in August. The parameters would mirror those of the May series, which included one 14-day and one 7-day operation priced at 1 basis point above IOER. Recall that in the spring, the Federal Reserve announced plans to continue TDF testing periodically in order to maintain operational readiness.

Outside the June quarter-end, daily ON RRP take-up was generally consistent with levels prevailing over prior periods, as shown in the bottom-left panel. Federal Reserve repurchase agreements with foreign official institutions—the foreign RP pool—also remained steady at around $150 billion. Recall that the foreign RP pool is an overnight investment facility that since the mid-1970s has provided foreign official institution account holders at the Federal Reserve Bank of New York with access to a safe and liquid dollar instrument. The investments in the foreign RP pool drain reserves from the System on an overnight basis. The size of the foreign RP pool remains notably above its pre-crisis levels, in part reflecting central banks' desire to hold greater dollar liquidity buffers and a tightening of their counterparty risk-management frameworks following the crisis. It is against this backdrop that I would like to highlight ongoing work to update the foreign RP pool framework, as described in the staff memo circulated in advance of the meeting and summarized in the bottom-right panel.

Historically, we have relied on individual account targets to manage the pool's aggregate size and daily volatility. However, reflecting the current high-reserve environment, we have informally relaxed account-level targets over the past few years. Awareness of this shift among account holders has been uneven because it has not been reflected in their terms of service. To formalize the change in practice and provide clearer communication to customers, the staff intends to revise customer terms of service to remove both individual targets and the requirement to notify the Federal Reserve Bank of New York ahead of balance changes in excess of $100 million. We would establish an internal process for processing individual customer balances above $30 billion, partly for operational reasons and partly to understand the source of the demand. In addition to the benefits associated with improving our communications to customers, these changes would likely increase customer access to high-quality short-term dollar investments at a time when the availability or attractiveness of alternative options in the open market—namely, Treasury bills and commercial bank deposits—may be more limited.

As the outlook for excess reserves is not expected to change significantly in the near term, the staff does not expect this to have a material effect on monetary policy implementation. In the event that the size or volatility of the foreign RP pool begins to exert an unwanted influence on money markets, the staff could reintroduce individual targets or caps, or an overall cap. The revised terms of service will continue to provide the Federal Reserve with full discretion to make such changes at any time.

Although take-up in ON RRP operations and usage of the foreign RP pool have remained relatively steady, demand could increase in the near term because of shifts in Treasury bill supply. As shown in the top-left panel of your final exhibit, the risk of the debt ceiling binding later this year may lead the Treasury to reduce the supply of bills. Indeed, according to Board staff projections, bill supply is expected to decline roughly $90 billion (or 6 percent of total bills outstanding) from current levels through the end of November, around which time the debt ceiling is assumed to be lifted and bill issuance resumed. Nonetheless, such a decline in bill supply could lead to lower short-term interest rates and an increase in demand for Federal Reserve RRPs later this year, which is also the time when many market participants expect the FOMC to begin policy firming.

Turning to other SOMA-related developments, the Desk is planning to initiate CUSIP aggregation of agency MBS beginning next month, as highlighted in the top-right panel. Recall that in early 2011, the Desk performed a similar operation that resulted in cost savings to the SOMA portfolio and significant portfolio management benefits. We have similar goals now and believe this measure would also make it easier to sell SOMA's MBS holdings, should the Committee direct the Desk to do so in the future. The Desk plans to aggregate roughly 60,000 individual Fannie Mae and Freddie Mac securities into approximately 350 new pools, representing a combined face value of $1.27 trillion. As described in a memo circulated prior to the meeting, the Desk intends to release a statement as well as FAQs this Friday and to start aggregation in mid-August. Once we begin the aggregation process, we expect that the associated costs will be recovered through custodial cost savings within two to four years. Should the Committee decide to commence policy firming at this meeting, we would plan to postpone the start of CUSIP aggregation to avoid complicating the communications associated with liftoff.

As a final administrative update, I would like to make you aware that a summary of the daily planning call between Desk and Monetary Affairs staff is now being posted each day on the Class II FOMC–Restricted (FR) section of MarketSource. The Desk would be happy to assist you in receiving this information, if interested. That concludes our prepared remarks. We would be happy to take questions.

CHAIR YELLEN. Questions for either Simon or Lorie? President Bullard.

MR. BULLARD. Thank you, Madam Chair. Let's go back to exhibit 1, panel 3, which shows the survey-implied probability distribution of the timing of liftoff. I just have a simple question about this. When was this survey taken relative to events in Greece and to Chair Yellen's testimony?

MR. POTTER. It was taken after most of those events. We got the results on Monday and Tuesday of last week, and that would fully take those into account. The only recent event of large significance would be the drop in the Chinese stock market yesterday.

MR. BULLARD. Okay. Thank you.

CHAIR YELLEN. Other questions? President Evans.

MR. EVANS. Simon, during the comments on the dealer survey, I think you mentioned that they must have made some comments about the expected strained liquidity conditions at year-end.

MR. POTTER. We received that more directly from market contacts.

MR. EVANS. In those comments, are they talking about historical strains during that time period, a new liquidity environment affecting that period, or uncertainty about the liftoff environment?

MR. POTTER. I think part of it is just the classic, "The Fed won't do things in December because there's Christmas and the New Year and people aren't there," which we heard frequently. We heard that in 2013.

MR. EVANS. Why would they say that? We raised rates in 2004 and 2005 in December.

MR. POTTER. I'm just reporting what they said. I'm not going to assess whether it's got any merit.

MR. EVANS. All right, that is the rule.

MR. POTTER. On 2013, I think I belittled their views a little bit about whether they'd actually be there when the FOMC made its statement. I think they will be. The slightly different variation—Vice Chairman Dudley talked about this at the June meeting—is that they're aware there's a lot of movement in money markets as you come up to quarter-end, and there's a belief that those could be more intense around year-end. So there are some market participants who believe that the FOMC would be wary of lifting off around year-end because of the ability to show interest rate control. It's not a view that I share in terms of the tools that we have, but definitely some of the people we speak to have that perception.

MR. EVANS. Okay, so that's along the lines of the latter point that I was suggesting and that Vice Chairman Dudley has mentioned before. Thank you.

MR. POTTER. But I think that most of what we hear is just that market liquidity in general is not as robust at the end of the year. So if there's some noise around liftoff, then that could be exaggerated by that lack of liquidity.

MR. EVANS. Okay. All right.

CHAIR YELLEN. President Kocherlakota.

MR. KOCHERLAKOTA. Yes, thank you, Madam Chair. Simon, I have a question about panel 5 in exhibit 1. My question is, what are the Desk's perspectives on why we now see deviations between the price of oil and five-year, five-year breakevens?

MR. POTTER. There's definitely—from some market technical reasons—some seasonals in TIPS trading that could account for that. We didn't have a good explanation for the high correlation you can see in that chart earlier. We looked for some explanations. Some of those explanations should still be in play, so that would make us perhaps doubt those explanations that we came up with before, because we were clutching at straws a lot.

MR. KOCHERLAKOTA. Right.

MR. POTTER. The only thing I'd note is that, in the past few days, the five-five forward has come down, and that does seem to be in response to further falls in the prices of oil and metals. So even though it's hard to see on this scale, the five-year-five-year forward over the intermeeting period has been relatively stable, but it still ended low.

MR. KOCHERLAKOTA. That's correct. Thank you.

CHAIR YELLEN. Other questions? Seeing none, we need a vote to ratify domestic open market operations. Any objection? [No response] Seeing no objection, consider that done. Our next agenda item has to do with normalization planning, and I'm going to call on Lorie to begin.

MS. LOGAN.[2] Thank you, Madam Chair. I will be referring to "Material for Briefing on Normalization." Jim Clouse and I will summarize the state of preparations related to the approach the Committee has said it intends to take to normalize the stance of monetary policy.

Having conducted nearly two years of daily test operations, the Desk is prepared to implement an ON RRP facility to support IOER in moving the effective federal funds rate into the target range when the FOMC commences policy firming. At that time, the domestic policy directive that governs the Desk's conduct of open market operations will need to incorporate instructions for the ON RRP facility and term RRPs. The ON RRP test operations that have been conducted under the resolution passed by the Committee last December will then cease.

The draft policy implementation note associated with alternative C in this meeting's Tealbook B presents a revised proposal for the Desk directive at the time of liftoff. This takes into account your feedback on the draft directive that Thomas presented at the June meeting.

I would like to highlight three key elements of the draft directive, which are summarized in your first panel. First, we have added an effective date to the directive. The staff recommends that changes in the FOMC's target range for the federal funds rate as well as changes to all overnight administered rates—namely, the IOER and IORR rates, the ON RRP rate, and the primary credit rate—be effective the day following the announcement of the Committee's policy decision. This marks a departure from the Federal Reserve's past practice. However, it will allow changes in the full set of overnight administered rates to be introduced concurrently in support of an FOMC decision to change the target range, increasing the likelihood of the effective federal funds rate trading within the target range each day.

As shown in your second panel, this new convention would be consistent with the practices of several other major central banks. It would also maximize the public's understanding of the Committee's policy framework. From an operating perspective, this approach is consistent with the staff's recommendation that any intermeeting changes in administered rates be announced at 4:30 p.m. when most markets are closed and are therefore only able to take effect the next day. Should the Committee support this approach, the staff recommends communicating the decision about the effective date for the other administered rates prior to liftoff, such as in the July

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

minutes, as we have started to receive questions by the public on the expected timing of changes in the overnight administered rates when the Committee commences policy firming.

The second element of the draft directive to highlight is the clarification of the description of capacity for the ON RRP facility. Your third panel illustrates the language in the draft directive that could apply if the cap was temporarily suspended, indicating that the Desk could conduct ON RRPs in amounts "limited only by the value of Treasury securities held outright in the SOMA that are available for such operations." We believe this language is consistent with the spirit of a suspended cap while at the same time highlighting the practical limitations that preclude unlimited provision of ON RRPs. The Desk's operating policy statement, which would be posted following the publication of the FOMC's policy decision and implementation note, would explain how the staff would derive the operational limit and note that the value of Treasury securities in the SOMA available for RRP operations would be about $2 trillion.

Finally, as summarized in your fourth panel, the draft directive strikes the sentence in the current directive that states it "seeks conditions in reserve markets consistent with" the federal funds rate trading in the FOMC's target range, as the language would no longer be as reflective of policy implementation in the post-liftoff framework. The draft, however, retains the directive's broad instruction to the Desk to undertake open market operations "as necessary" to keep the federal funds rate in its target range. This language is followed by specific instructions to undertake overnight and term reverse repurchase agreements according to parameters approved by the Committee.

The baseline expectation is that reverse repos will be the only open market operations needed to support IOER to keep the effective federal funds rate in the FOMC's target range. Nonetheless, a directive that authorizes the Desk to conduct other types of open market operations, if necessary—such as repos if the effective federal funds rate was expected to print too high—could signal to the public that the Committee has given the Desk some latitude to respond quickly to unexpected circumstances. Any use of such authority would be limited and aimed at addressing transitory factors, such as in response to a major payments system disruption. In the event of more persistent issues, the FOMC may choose to revise its guidance to the Desk. The Desk would consult with the Chair and inform the FOMC of any plans to conduct open market operations other than the reverse repos specified in the directive.

In addition to the revisions I have highlighted, other changes as shown in the draft directive for alternative C in Tealbook B, are generally consistent with the housekeeping-type changes that Thomas presented to the Committee in June.

To summarize, at the June meeting you unanimously supported a proposal for the Federal Reserve to issue an implementation note that would communicate separately from the Committee's postmeeting policy statement the specific measures the Federal Reserve was employing to implement the FOMC's decision. This note will include the policy directive to the Desk that you ultimately adopt. We highlighted a few key elements of the draft directive for consideration, and the staff recommends the Committee communicate about the intended effective date of changes in the target range and administered rates in the upcoming minutes. Jim will now discuss other elements of the implementation note.

MR. CLOUSE. Thanks, Lorie. As shown in the second exhibit, the implementation note will include information on the key administered rates that will support policy normalization. Assuming that the FOMC initiates policy firming by raising the target range from 0 to 25 basis points to 25 to 50 basis points, the ON RRP rate would be set at 25 basis points, and the interest rates on required and excess reserves would both be set at 50 basis points. In discussing changes in discount rates at the April FOMC meeting, participants generally seemed to favor maintaining the primary credit rate at the current spread of 50 basis points above the top of the target range for the federal funds rate for some time after liftoff. As noted in the last bulleted item in the implementation note, that would imply a primary credit rate of 100 basis points immediately after liftoff. As Lorie noted, the staff is recommending that all of these changes in administered rates take effect on the day following the FOMC announcement.

As noted in previous discussions, changes in some of the administered rates require Board approval. Changes in the interest rates on reserves, required and excess, could be approved through a Board vote on the same day as the FOMC meeting. Approval for changes in the primary credit rate are somewhat more involved in light of the role of the Boards of Directors of Reserve Banks in the discount rate-setting process. On the day of any meeting in which the FOMC changes the target range for the federal funds rate, the Board could approve any existing requests by Reserve Banks for discount rate changes to the new rate to be effective on the next business day. In addition, any requests for discount rate changes from Reserve Banks received in the afternoon following the conclusion of the FOMC meeting or on the subsequent business day would be approved by the Board Secretary under delegated authority with the same effective date. These procedures are the same as those that have been in place for many years, except for the effective date.

For completeness, it is worth noting that the rates for two other forms of discount window lending—secondary credit and seasonal credit—are set by formulas routinely proposed by the Reserve Banks and approved by the Board. The secondary credit rate is set at 50 basis points above the primary credit rate. The seasonal credit rate is established every two weeks based on the average effective federal funds rate and the 90-day CD rate over the previous reserve maintenance period. These rates are not included in the proposed implementation note because they have no significant implications for the process of policy normalization.

If policymakers wished to employ term draining tools—the term deposit facility or term RRP—the implementation note could include the important details of those operations.

Turning to two other items related to normalization, as discussed in memos prepared for the June FOMC meeting, the Desk will be expanding its coverage of money market developments in the morning calls in the period immediately after liftoff. Moreover, the staff will brief policymakers each day at 2 p.m. in the days immediately after liftoff to review market developments and the effectiveness of policy implementation. Those afternoon briefings can be readily converted to formal FOMC and Board meetings as necessary should policymakers wish to discuss and implement any changes in the approach to policy normalization.

Finally, as discussed in previous FOMC meetings, the staff proposed a change to the methodology for the calculation of interest payments on reserves. After a public-comment period, the Board approved that change, and it became effective in the maintenance period that began last Thursday. The change in methodology should support the role of IOER as a policy normalization tool by ensuring that increases in the IOER rate are immediately reflected in higher interest payments to depository institutions. In particular, interest payments are now based primarily on the level of balances that a depository institution maintains each day and the level of the IOER rate in effect that day. That structure should help to ensure that an increase in the IOER rate immediately provides incentives for depository institutions to bid at higher rates in overnight funding markets and to require a rate of return at least as high as IOER on their investments in assets other than reserve balances. That concludes our prepared remarks.

CHAIR YELLEN. Does anyone have questions for Lorie or for Jim? Governor Tarullo.

MR. TARULLO. Thank you, Madam Chair. Jim and Lorie, understandably, the implementation directive would not refer to the expectation that the increase in the ON RRP would be temporary, and alternative C doesn't refer to it either. Would there be some other document that would be current and released around the time of liftoff and that would restate the expectations of the Committee as articulated in the set of normalization principles we agreed to some time ago?

MR. CLOUSE. There could be. We haven't discussed that among the staff, but, certainly, it's already in the public domain, as you say.

MR. POTTER. I think your question is, can we reiterate that at the time of liftoff.

MR. TARULLO. Yes. Somewhere.

MR. POTTER. I think there's space to do that in the Desk statement, which is a very low-key way of doing it. It's probably not the ideal way, because that's a policymaker statement. But we could reiterate the language used in the March minutes associated with that, which were basically added to the Principles and Plans document. One approach could be to rerelease the Principles and Plans in the minutes.

MR. TARULLO. Yes. If there's some way of doing it that's not awkward, I think it would be good to reiterate that.

VICE CHAIRMAN DUDLEY. Or it could be in the press conference.

CHAIR YELLEN. It could be in the press conference. Let me think about that. That's certainly a possibility.

MR. TARULLO. Okay. Thank you.

CHAIR YELLEN. Other questions or comments? President Kocherlakota.

MR. KOCHERLAKOTA. Yes, Madam Chair. I want to build on what Governor Tarullo was talking about. I think it would be useful for the Committee to have in mind exactly what kind of conditionality would be driving the changes of the cap on RRP. It's clear there's a lot of support for not having a cap at liftoff, but at what point in time and under what conditions would it be adjusted? I think we have talked about that some in the past, but perhaps I'm not just not remembering what kinds of conclusions we had reached about that. And I think it would be useful for us to have, at least, a refresher on that.

MR. POTTER. My memory is that we used some language that was trying to get at the notion it was temporary, but gave some flexibility. For example, there might be requirements for flexibility in the fall if there are complications associated with the debt limit. And even though under other conditions you might want to introduce the cap, you might not feel comfortable at that point, but the language was "expects when it's appropriate."

CHAIR YELLEN. We said "fairly soon," I think.

MR. POTTER. "Fairly soon," but there was something about expectations. But there was wiggle room because we would learn a lot perhaps in the first few weeks.

MR. KOCHERLAKOTA. Yes, that language seems appropriate to me. My comment or question, though, is about having some common understanding on the Committee about what kinds of conditions will lead us to actually start to impose a cap.

VICE CHAIRMAN DUDLEY. In fact, the idea is that, once we gained experience with the overnight RRP and what the take-up was going to be, we would then set a cap with a reasonable amount of head room so the cap would not be binding. But it would take time to generate some experience.

CHAIR YELLEN. Right, and if necessary you adjust the rates or the spread in order to manage that.

MR. POTTER. I was just highlighting for you that the fall has the conflating factor in terms of understanding.

VICE CHAIRMAN DUDLEY. Yes, the debt limit is a wild card.

MR. KOCHERLAKOTA. Yes, I imagine year-end will be another conflating factor.

MR. POTTER. Year-end is something that we understand better than the debt limit.

MR. KOCHERLAKOTA. Yes.

CHAIR YELLEN. Further comments or questions? [No response] In their presentations, both Lorie and Jim said that the staff recommends that all of the policy rate changes become effective the next day. I didn't hear any questions about that. So let me ask:

Would there be any objections to reporting in the minutes of this meeting that the plan was to make these rate changes effective the next day? [No response] Okay. Seeing no objection, let's do that.

The Board meeting has ended. Now we're ready to move along to our next topic, which is reinvestment policy. We're going to call on Beth Klee to start us off.

> MS. KLEE.[3] Thank you, Madam Chair. Julie Remache and I will be referring to the handout labeled "Material for Briefing on SOMA Reinvestment Policy."
>
> As you know, the Policy Normalization Principles and Plans state that the Committee expects to cease, or commence phasing out, reinvestments of principal on securities held in the SOMA after it begins increasing the target range for the federal funds rate, and that timing will depend on how economic and financial conditions and the economic outlook evolve. As background for the Committee's discussion on reinvestments, the staff prepared the memo titled "Reinvestments Considerations." The memo described several strategies that you could take and reviewed a range of issues associated with each strategy. We also suggested questions to help structure your discussion of this topic.
>
> The top two panels of your first exhibit summarize the strategies as well as some pros and cons of each. As shown in the top panel, the first set of strategies are calendar dependent—reinvestments would cease at a set date or after a specified interval following the initial firming of the federal funds rate. The Committee could follow a strictly calendar-dependent strategy or make the date conditional on macroeconomic conditions. Of note, a conditional calendar-based strategy is similar to that employed in the forward guidance for the federal funds rate from 2011 to 2012.
>
> You may want to use a date for communicating the anticipated end of reinvestments if you are reasonably confident that a reversal of the decision to cease reinvestments will not be necessary or because you view it as a parsimonious and effective approach to communicate economic conditionality. As noted to the right, a calendar-based strategy would be relatively straightforward to communicate to the public. In addition, it would offer some certainty regarding the timing of the ceasing of reinvestments, and by implication, the path of the SOMA portfolio. These features could also be considered drawbacks in some circumstances, as this strategy could be seen as inflexible. In particular, the Committee could feel that, perhaps even with some conditionality, it could be difficult to deviate from the announced schedule even if the economy behaves much differently than expected. Under those scenarios, the Federal Reserve's action, or lack thereof, could send a confusing signal.

[3] The materials used by Mses. Klee and Remache are appended to this transcript (appendix 3).

As shown in the middle panel, the second set of strategies are state-dependent; reinvestments would cease based on specified economic conditions. The Committee could follow a quantitative state-dependent strategy wherein redemptions would commence based on a particular macroeconomic threshold. A quantitative state-dependent threshold strategy was used to provide forward guidance about the federal funds rate from 2012 to 2014. Another variation of a state-dependent strategy would be one that offered qualitative guidance regarding the conditions under which the Committee expects to cease reinvestments—not unlike the current guidance for the federal funds rate.

You may want to employ a state-dependent strategy if you believe doing so provides clear communications or if it enhances the "automatic stabilizer function" of monetary policy. That is, if the economy improves less rapidly than expected, the cessation of reinvestments would occur later; they would also cease sooner if the economy improves more rapidly. Consequently, a state-dependent strategy might also reduce the possibility of returning to the effective lower bound. Important challenges would be determining the appropriate threshold or trigger under a quantitative approach or being sufficiently clear about your reaction function under a qualitative approach. A state-dependent approach provides less certainty about the path of SOMA assets, but that consideration might be seen as offset by the improved economic responsiveness of this strategy.

The details of either a calendar-dependent or state-dependent strategy would, of course, affect the path of the Federal Reserve's balance sheet over time. To illustrate how the details matter, the bottom-left panel presents scenarios under the modal outlook in which reinvestments end fairly soon after liftoff or much later. The Tealbook baseline, the black line, is based on the assumption that reinvestments cease six months after initial policy firming, and that the federal funds rate will be around 60 basis points at that time. The dashed blue line illustrates a scenario where reinvestments cease nearly two years after liftoff, when the funds rate reaches 2 percent. Even though reinvestments continue for 16 months longer than in the baseline, normalization of the size of the balance sheet is delayed only about 9 months, in part because large amounts of securities are expected to mature around the time of normalization of the size of the balance sheet. However, as shown in the bottom-right panel, the funds rate would be at a higher level when reinvestments end, incorporating some insurance against possible zero lower bound scenarios. Still, the difference between the two funds rate paths is small, and this suggests that the benefit of extending reinvestments could potentially be modest. Of course, it is possible that there are effects of continuing or ceasing reinvestment beyond those captured in our models. To that end, Julie will now discuss market-specific considerations and expectations associated with ceasing reinvestments.

MS. REMACHE. Thank you, Beth. In thinking about the strategy to end reinvestments, there are some market-specific issues which the Committee may wish to consider.

In the Treasury market, the Federal Reserve's redemption of maturing securities will require the Treasury to auction more securities to the public than if the SOMA continues to roll over its Treasury holdings. As shown in the top panel of exhibit 2, maturing securities from the SOMA—shown in blue—would add, on average, 40 percent to the projected increase in public holdings from 2016 through 2020 relative to the increase arising from the budget deficit—shown in red. While these total increases are large, they are less than those recorded during the recession that followed the financial crisis. That said, 2008 to 2009 was a period in which demand for Treasury securities was elevated, and it remains to be seen how the market would adjust without this boost to demand.

While the market response to ending reinvestments will depend on the level and dispersion of market expectations for the path of the portfolio—which I will discuss in just a moment—in the case of Treasury securities, the effect will also be determined by the Treasury's decisions about the maturity profile of the additional securities it issues. The Treasury might initially respond to the onset of SOMA redemptions by issuing more bills. Over time, however, the Treasury would likely shift this financing toward longer-maturity coupon securities.

In the MBS market, participants have expressed more concern about potential market strains. During the period where the Federal Reserve continues to reinvest the principal it receives from its MBS holdings, it will be purchasing approximately 30 percent of gross TBA-eligible issuance, a proportionately larger amount than in the Treasury market. In addition, the inherent difficulties in accurately predicting prepayment activity implies considerable uncertainty about the dollar amount of reinvestments, limiting the extent to which markets can fully anticipate the effect of a decision to cease reinvestments.

The bottom panel of your exhibit shows net changes in the Federal Reserve's MBS activity over time. Focusing on the black line, it highlights that in March 2010, following the completion of the first round of asset purchases, the shift in Federal Reserve participation in the mortgage market was larger than what is projected based on the current forecast, shown by the dotted portion of the line in early 2016. Overall, the market withstood that change without significant disruption. That said, the underlying structure of the market has shifted since then, with greater concentration among dealers and more constrained balance sheets due to the changing regulatory environment.

These concerns may support a decision to phase out reinvestments over time rather than ceasing them all at once. On the one hand, while a well-telegraphed end to reinvestments is not likely to lead to significant disruptions, phasing out reinvestments may provide insurance against this possibility and, if executed over a few quarters, would likely not have significantly different macroeconomic effects compared with a case in which cessation occurred all at once. On the other hand, it would lead to a slower decline in the portfolio, though the change would only extend the timing of the normalization of the size of the portfolio by a few months.

The Committee may also wish to consider phasing out reinvestments in order to address the uneven pattern of redemptions. As shown in the top panel of exhibit 3, the amount of maturing Treasury securities held by the SOMA—shown by the red bars—will vary between $2 billion and $39 billion per month in 2016. Although the projection of MBS principal payments—shown by the blue bars—appears smooth and steady, actual prepayments will vary over time as a function of prepayment behavior. Smoothing redemptions may, on the margin, help the market absorb the new supply without a noticeable effect on the overall trajectory of the balance sheet or the associated withdrawal of accommodation. An incidental benefit of phasing out Treasury reinvestments over time would be to add Treasury benchmark securities to the SOMA portfolio during the reinvestment period, which could then be made available to lend. The SOMA has not held benchmark securities for some time because of the sales under the System's maturity extension program, but making securities available to lend from the SOMA is helpful when there is tightness in the specials repo market.

If the Committee wished to phase reinvestments out over time, it could do so in a number of ways. A straightforward approach would be to reinvest a decreasing proportion of Treasury maturities or MBS principal payments over time. This would result in a slower reduction in the portfolio and would smooth the pattern of maturities and principal payments to some extent. Another approach could involve setting a maximum dollar amount of securities that would be allowed to mature or prepay without reinvestment in each month and to increase the dollar amount over time. This would have a similar effect of slowing the reduction in the portfolio and would smooth the pattern of reductions more directly. As with the strategy to begin to cease reinvestments that Beth discussed, these strategies could be executed based on a set schedule, or they could be contingent on continued improvement in the economy. Further staff work could be completed to evaluate these and other options should the Committee decide to phase out reinvestments.

Turning now to market expectations, as shown in the bottom-left panel of your exhibit, the median respondents to the Desk's Survey of Primary Dealers and its Survey of Market Participants expected both Treasury security and MBS reinvestments to cease approximately seven months after liftoff, but there was a wide range around this figure, with some respondents expecting reinvestments to cease at liftoff and others expecting reinvestments to continue for more than a year. As shown in the bottom-right panel, respondents generally place the highest probability on reinvestments being gradually phased out over time. The median expectation is that, should reinvestments be phased out gradually, this would be done over a period of about 11 months for both Treasury securities and MBS, though again, expectations for this are dispersed. Overall, respondents generally expect the reinvestment policies for Treasuries and MBS to be similar.

While market participants are generally not focused on whether a decision about reinvestments would be specifically calendar or state dependent, many note that they expect the Committee to be attentive to economic and financial conditions and to take account of potential disruptions to market functioning and liquidity in determining the pace at which reinvestments could occur. In supporting this view, many cite the Committee's Policy Normalization Principles and Plans statement and other communications emphasizing a gradual approach to normalization. Some policymakers' recent communications have reinforced these ideas, including the notion that a change in the reinvestment policy could be tied to the level of the federal funds target range.

We should note that survey respondents and market participants indicate that they do not hold firm views about reinvestment, in light of the limited information available to them about the FOMC's thinking on this topic.

The final page of your handout provides the questions circulated to you previously. Thank you, Madam Chair. That concludes our prepared remarks. Beth and I would be happy to take questions.

CHAIR YELLEN. Thank you. Were there questions or comments? President Williams.

MR. WILLIAMS. Yes, I just have a question about the phaseout. Julie, you listed a whole bunch of arguments in favor of a phaseout. In weighing these, would you describe them primarily in terms of market dislocations, disruptions, and other aspects of it, or is there really much of an economic argument in terms of macroeconomic goals here? I'm just hoping to clarify what is the advantage of a phaseout over, say, 6 to 12 months.

MS. REMACHE. I think the main advantage to considering a phaseout would be to address the potential risks related to market functioning. When we run the scenarios, we don't see very significant changes in the macroeconomic outcomes, whether you use a phaseout or not. So I think the arguments would probably fall primarily in the market-functioning state.

MR. WILLIAMS. Because I always wanted to be a lawyer, I'm going to do a follow-up question. When you say "not significant," you mean indecipherable in looking at a picture of inflation and unemployment?

MS. REMACHE. I would say, basically, yes.

MR. WILLIAMS. Thank you.

MR. POTTER. With the one caveat that in 2013, talking about what we might do in the future with a portfolio, in terms of the taper, had very big effects.

VICE CHAIRMAN DUDLEY. And the model would say that it would have no effects.

MR. POTTER. The model would say that it would have no effects. That's the only caveat to that.

MS. REMACHE. So it's important to recognize, in terms of the market response, that it will depend on where market expectations are at the time and how dispersed they are. In thinking about the communications, that communication can clarify a range of expectations, and that could cause a change in market rates relative to before the announcement.

CHAIR YELLEN. President Evans.

MR. EVANS. When you say "market rates," and you talk about the taper, I guess the one market rate that seems most important is the mortgage rate. Can you imagine that mortgage rates would have some type of outsized effect? Is that what you're talking about?

MS. REMACHE. I think the effect could be both in the Treasury rate as well as the mortgage rate, but it would likely be more pronounced on the MBS side. But I think it's also important to draw a distinction between the effects of the programs in terms of the changes in levels. As the portfolios unwound, you would expect—and, in fact, it's incorporated into the model—that rates should rise over time. In addition to those effects, there could be other, more temporary or transitory effects where you could see some more widening. We are hearing relatively more discussion about it in the MBS market than in the Treasury securities market.

MR. EVANS. Thank you.

CHAIR YELLEN. Other questions? [No response] Seeing none, why don't we begin our go-round. Governor Tarullo is going to start us off.

MR. TARULLO. Thank you very much, Madam Chair. I begin from the premise that the issue of when to cease reinvestments of the SOMA portfolio needs discussion among policymakers not only because of some of the considerations that Beth and Julie have just raised, but also because, while the funds rate and portfolio adjustments are both available monetary policy tools, we don't regard them as perfect substitutes for one another.

Before answering the questions that were put to us in the staff memo, I want to start by specifying what I think are the salient differences between them, for our purposes. First, in our previous discussions of normalization policy, several participants have expressed the view that we should use only federal funds rate increases in the early stages of tightening so as to return as quickly as we can to a point where material federal funds rate reductions would be available as a response to a downturn in the economy. The preference for federal funds rate reductions over additional SOMA purchases presumably arises from some combination of our sense of the relative efficacy of the two instruments in the contemplated deteriorating conditions and of concerns about institutional or external reactions to another LSAP program. This view seems quite sensible, though I might note in passing that the caution inherent in this view would also seem to argue, at least at the margin, for a delay in a start to tightening in order to reduce the chances of a downturn that would require a policy reversal.

A second difference is the possibility that through some combination of direct and signaling effects, cessation of reinvestments in Treasury securities would more directly affect the longer end of the yield curve. Right now, the average duration of Treasury securities in our portfolio is around seven years. Reinvestments would probably have a duration of five to six years. So stopping reinvestments would increase the supply of longer-duration bonds in the market. This possibility would become significant if, as some observers have speculated, our initial increases in the federal funds rate do not yield proportionate increases further out on the curve, an outcome presumably of some importance if the Committee's efforts to tighten financial conditions are to be effective in the real economy. Of course, if the shape of the curve were determined overwhelmingly by market expectations of future short-term rates plus a term premium, then theoretically an anticipated reduction in our balance sheet size shouldn't affect longer-term yields. But I think we've seen in recent years that actual changes in the supply of securities can have some effects that are not altogether driven by rational expectations of future conditions.

Third, if the ON RRP program becomes and remains larger because of the quantity of reserves associated with our large balance sheet, then the concerns I've previously expressed with respect to financial stability might be mitigated through earlier measures to reduce its size. Of course, the size of the ON RRP after liftoff will depend on many factors, including the Treasury's decisions on bill issuance and the speed with which banks begin to raise the rates they pay on deposits. And depending on when we began roll-offs, the mitigating effect might be pretty modest and more about signaling than direct effects. But the possibility raised in the recent memo to Reserve Bank research directors—that the demand for ON RRP might *increase* over time, rather than stabilize or decline—is another reminder of why we should keep the financial-stability and market-structure issues in mind.

Fourth, and finally, the fact that we hold a lot of MBS means that portfolio adjustment might have a disproportionate effect on mortgage markets relative to federal funds rate increases. Our decisions on reinvestment policy will be usefully informed by considering which of these differences are very likely to be important for our policies and which would be important only if less probable contingencies were to arise.

The fact that we don't know at the outset of normalization whether we will need to react to a near- or medium-term downturn argues for pursuing initial tightening solely through federal funds rate increases so as to reacquire as quickly as possible the less controversial—and arguably more effective—tool of funds rate decreases. But I wouldn't want to adopt a policy that ruled out an earlier cessation of rollovers in the event that developments affecting the yield curve or the ON RRP program made such a step advisable. In short, my current thinking is that our presumption should be that we will raise rates several times before ending reinvestments, but that we might move more quickly if we observe post-liftoff difficulties in these other areas.

Looking at things this way, I'd be disinclined to get very specific in an ex-ante communication strategy. Calendar guidance, even conditional, would almost surely be read as a near commitment. And I don't see how to sensibly use economic indicators such as unemployment or inflation as triggers because those kinds of indicators are relevant to the overall pace of tightening through both instruments. The reasons for maintaining some optionality concerning portfolio practices pertain to financial conditions, which would be particularly difficult to capture in quantitative terms, especially because there are some quite distinct considerations. I think this argues for only a modest change in the policy we announced in our normalization principles last fall—namely, that the timing of the cessation of reinvestment will depend on how economic and financial conditions and the economic outlook evolve.

The modest change would be to add something to reflect that aim of reacquiring interest rate reductions as a policy tool. One possible formulation—although I'm sure there are others that would capture the thought, and I think Vice Chairman Dudley has got one—would be to echo the Bank of England, which in various communications has indicated that the Monetary Policy Committee is not likely to change the size of the Bank's balance sheet until the Bank rate has reached a level from which it could be cut materially if needed. It's worth noting that the Bank of England has kept this position pretty general and has not incorporated it into formal statements of monetary policy. It's been mentioned in some FAQs, referred to in its quarterly *Inflation Reports*, and, in even more general terms, mentioned by Governor Carney in testimony to a parliamentary committee. It seems to me very sensible for us to emulate the Bank of England and not make too big a deal of all this so as to avoid creating specific expectations that might be taken as near commitments or used as benchmarks to evaluate how normalization is going. That suggests to me that we should communicate this modest elaboration of our intentions through the minutes or through an answer by the Chair to a question at a press conference.

Next, I'd note that the bunching of maturing Treasuries in our portfolio would happily coincide with the approach I've just suggested, assuming our first funds rate increase happens later this year. Right now, relatively small amounts are maturing each month. But in the period from February to May 2016, as one of the charts that they distributed shows, we have a substantial jump in maturing Treasuries to $128 billion over those four months. Then there's a pattern of a few low months followed by one higher month until early 2018, when the amounts for both higher- and lower-maturity months increase substantially. If we thought in terms of ceasing reinvestments in the second half of next year, we would have given ourselves time to make a few federal funds rate increases, assuming the central tendency of the Committee holds, and yet still have a period of relatively low amounts maturing monthly so as not to tighten financial conditions very much via portfolio runoff, at least for a while.

Finally, with respect to the issue of full cessation or phaseout of reinvestments, I feel differently about Treasury securities and MBS. For Treasury securities, I'd probably favor ceasing most reinvestments immediately or soon after we make the decision to move ahead, particularly if that is in a period when relatively small amounts were maturing. However, in light of the fact that the pattern of maturation is quite uneven, I'd be interested in Simon Potter's views as to whether it would be a good idea to smooth out the reduction in our Treasury portfolio as well as whether there are other reasons to continue to roll over a modest amount for some period of time, which I think Julie Remache alluded to. As to MBS, because our portfolio accounts for a substantially greater share of that market, it's probably better to phase out reinvestment of agency MBS, though as to precisely how, I would again want to be guided by advice from the Desk. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you. As posed in the staff memo, there are two essential issues. First, should the process of ending reinvestments be based on calendar time or just state dependent? Second, when we end the process of reinvestment, should we do this by tapering or instead by "cold turkey," and should the process be the same for Treasury securities and agency MBS?

Turning to the first point, I come out pretty close to what Governor Tarullo said. I'm on the side of qualitative state-dependent guidance. State-dependent guidance has a number of advantages over calendar-based guidance. First, working through the expectations channel, state dependency would automatically add or subtract support to the economy as incoming data pushes back or pulls in expectations about the end of the timing of reinvestments. Now, this is not a particularly strong effect in most states of the world, but it might be very helpful if the draw on the outlook was particularly negative.

Second, it seems prudent to avoid prematurely committing to end reinvestments, in view of the asymmetry of the policy options should the economy prove weaker than expected. If the economy were weaker than expected, our tools to provide support are limited in that direction. Reversing course and stopping the balance sheet from shrinking once the process has begun—we have that option—would be difficult to do in practice, and the scope for policy accommodation by reducing short-term interest rates would be quite limited for some time by the proximity of the zero lower bound.

I prefer qualitative state-dependent guidance rather than defining particular variables as triggers for action. This is motivated by my view that the end of reinvestments should be driven by the likelihood that we'll be forced to return to the effective lower bound sometime in the relatively near future, and that likelihood simply cannot be summed up by a single parameter. For example, I could imagine ending reinvestments at a relatively low federal funds rate if the economy had considerable forward momentum or waiting a bit longer if the momentum were less strong or if there were greater risks that it might not be sustained in the future. The qualitative standard that I have in mind would read something like this, which I think tracks the Bank of England approach: "reasonable confidence that the economic outlook will not warrant a return to the zero lower bound in the next few years"—or something similar. In my mind, this probably would not imply ending reinvestments until the federal funds rate was at least 1 percent, but probably even higher, depending on the economy's forward momentum and the risks to the outlook that were in place at that time.

Now, the major downside to qualitative state-dependent guidance is it makes it a much bigger deal when we finally actually do decide to shrink the balance sheet. Thus, there is a greater risk, in this approach, of a bigger market reaction. However, I think this risk can be lessened by good communications. As long as we're clear about what's driving our thinking, then market participants should be able to think along with us and anticipate our decision. We could also reduce the risk of surprise by communicating our thinking in the FOMC minutes or in the Chair's press conference. My point is that the risk of surprising and destabilizing the markets is under our control to a large extent, so that we can minimize the risk of an outsized market reaction.

Now, for calendar-based guidance, it strikes me that the major benefit is that it damps any effect from the decision to begin to end the reinvestment process. There's no signal from the decision in terms of timing—it's already been folded in mechanically with the liftoff decision. This means that when redemption and wind-down begin, not much should happen because there's not a strong signal of any change in view on the part of the Federal Reserve. But this is offset by two significant negatives. First, as the start of ending the reinvestment process will represent a tightening of policy, it contradicts what we've been saying—namely, that monetary policy decisions are data dependent. If the timing of liftoff, which is a move to less accommodation, is data dependent, logic would imply that other means of tightening policy should also be data dependent. Second, it seems to me that we want to be careful about ending reinvestments prematurely. That is because once we begin on that path, it may be hard to reverse course—that is, to start reinvesting, and even harder to expand the balance sheet again. I, for one, want to be highly confident that we are unlikely to have to return to the zero lower bound in the near future before ending reinvestments. I'm not sure how to reconcile that with calendar-based guidance unless I push the calendar-based guidance very far off into the future, an option that I don't think is reasonably on the table.

Turning next to the issue of how to end reinvestments, I would favor tapering, and I would not distinguish between Treasury securities and agency MBS. I favor tapering because it reduces the risk of any damage to market function. We just don't know what those risks are, and I don't see why you'd want to take a chance when you are not really sure how big those risks are. Doing it this way also would be generally consistent with current market expectations. The cost in terms of delaying the normalization of the balance sheet are low as long as the taper is not stretched over a long period—that is, as long as it's not stretched out for more than a year or so. I wouldn't distinguish between Treasury securities and agency MBS because I'm not convinced that we really have a strong compelling reason to do so. If you weren't tapering, you might want to differentiate, because the risk to market functioning might differ. But because tapering addresses that market-functioning risk directly, then there no longer seems to be a case for differentiation once you've made the decision to taper.

Now, assuming that tapering is the way the Committee ultimately wants to go, the next question would be the length and the form of taper. I assume you don't need to stretch out the taper very long, but I'd be interested in hearing from the staff about the pros and cons of a shorter versus longer taper. With respect to the form of the taper, as Julie said, there are a number of ways to go. You can reduce the amount of reinvestment by a fixed percentage each month, or you can reduce it by a fixed dollar amount. These have different characteristics in terms of the risk to market function and the trajectory of the balance sheet. I'm not sure which of these has better properties, frankly, so I would encourage the staff to come back with some proposals. If we decide that tapering is the way to go, what is the best way to do it and why, because it's not obvious? Do you want to have more predictability on the amount of reinvestment being reduced each month, or do you want to have more predictability in terms of the path of the balance sheet each month? It's not obvious to me which is right. I think it's really important that we do clarify what we think about reinvestments, because when we lift off, the Chair is going to go to the press conference and one of the first questions is going to be, "Okay, now that you have lifted off, what are you going to do about reinvestments?" I think the more we can clarify that matter before we get to that point, I think that would be a good place for the Committee to be. Thank you.

CHAIR YELLEN. Agreed. Thank you. President Williams.

MR. WILLIAMS. Thank you, Madam Chair. Now, this especially is timely. I'm increasingly being asked about our balance sheet normalization plans, and prudent planning and good communication argue for settling on a strategy and tactics in advance of liftoff.

Like Governor Tarullo, I kind of stepped back when I got the memo and the questions. I recall something that President Evans said when I first became president. When I answered the questions in the memo, he said, "That's a rookie mistake." [Laughter] I've been in the job now roughly four and a quarter years, so I'm not making the same rookie mistakes anymore. Like Government Tarullo, I looked back and said, "What are we trying to accomplish here? Under what conditions would certain approaches work better than others?" And that led me to think again about the issue of what the strategy is, and from that perspective consider the tactics or some of the questions more in the context of thinking about it in terms of what's our strategy with regard to this.

One possible strategy would treat the balance sheet—and I actually was struck by the fact that the memo was kind of pushing this way—as an active policy tool on par with the funds rate. We're looking at economic conditions, looking at the forecast, deciding whether it's time to end reinvestment or to pare back on reinvestment. I didn't think anyone would use the word "taper" again—I'm surprised by that. But really, you're thinking the balance sheet would be adjusted based on economic conditions, and our policy communications would highlight the intentions about both the balance sheet and the funds rate.

The other strategy is to put management of the balance sheet into the background, and instead focus policy actions and communications squarely on the funds rate. In this case, the balance sheet reductions are aligned with the overall thrust of policy, obviously driven by our macroeconomic goals. But they wouldn't be actively managed in the same way as the policy lever. So I strongly prefer the latter strategy.

The Committee and financial market participants have a much better understanding of and more confidence in using the federal funds rate to conduct and communicate monetary policy. In the past—notably during the taper tantrum—markets have viewed our balance sheet communications as signals about our intentions regarding the future path of the funds rate. A clear subordination of the balance sheet management to the funds rate would help avoid such confusion in the future. In addition, the primacy of the funds rate is consistent with our treatment of other supporting tools in our normalization plans, such as the IOER and the overnight reverse repo facilities. And, finally, keeping the balance sheet actions in the background would be consistent with our earlier statement on policy normalization—that is, it indicated that reductions in the size of the balance sheet would be gradual and predictable.

In the context of these strategic considerations, I think our recent experience with funds rate forward guidance and with expanding the balance sheet through QE provides a couple of important lessons for the future. To begin with, date-based forward-looking policy statements boxed us in at times in arbitrary ways. Similarly, setting policy thresholds based on economic variables proved problematic. Thus, I would prefer not to use any date-based guidance—I'm thinking about "six months" or some phrase like that—or economic variable thresholds for communicating the conditions to start reducing the balance sheet. With regard to using a specific level of the funds rate—say, 1 percent—as a threshold, I do see merits in that approach. Specifically, it's linking our policy decisions and our tools together. But I do think it could place undue attention and public speculation on what should be a relatively under-the-radar balance sheet action.

What I would prefer is something qualitative. There have been a couple of suggestions about this, but I personally prefer the Chair's eloquent public comments—namely, that we would begin the process of ceasing reinvestment after the Committee was comfortable that the normalization process was successfully under way. I actually think that covers the comments that we've already heard about having the interest rate high enough that we're in a comfortable place, taking into account the zero lower bound. Actually, let me respond to the Vice Chairman's comment. I do think that this reasonable confidence that we won't return to the zero lower bound just opens a whole box of issues about what does that mean and how do we measure it. This reasonable confidence is something that's hard to define, as we've learned.

We should also keep in mind that the projected timeline for normalizing the balance sheet, absent asset sales, is already quite long. The baseline Board staff projection says that our balance sheet will still be putting downward pressure on term premiums for another 10 years. In order to normalize the balance sheet before our retirements—all of our retirements—without resorting to asset sales, we shouldn't wait too long to halt reinvestments.

I'd also prefer to end reinvestments without any kind of taper or phaseout period. I'm still struggling with the argument for the phaseout. Obviously, if it's a phaseout over six months or something, I wouldn't be opposed to that, but I still don't quite see the strong argument for this. Every time we've ended one of our QE programs or we've done the taper, we haven't actually seen these market disruptions and dislocations that we've been so worried about. I understood being worried about them the first few times, but I'm not sure why we're still quite so worried about it. But, Julie, you said things have changed. So, again, maybe that's prudent insurance against the possibility that this could be more of a problem.

I do think it gets us back into the game of, if we do 50 percent of reinvestments the first time, or whatever we're thinking about, it's going to lead to the question, "Under what conditions are you going to do the next step-down or step-up?," or however you want to phrase that. And so if we do a phaseout, I would argue that it should be somewhat mechanical, like we did the taper—obviously, with language describing it, depending on economic conditions, but really be more on autopilot. I would argue that markets do seem to be sufficiently deep, that the flow considerations—again, a major concern associated with this—just don't seem to be that important. And I would handle MBS and Treasury securities in the same way in terms of ending the reinvestments. Thank you very much.

CHAIR YELLEN. Thank you.

VICE CHAIRMAN DUDLEY. May I ask a clarifying question? You said that downward pressure of the balance sheet on term premiums would last 10 years?

MR. WILLIAMS. Yes.

MS. REMACHE. The size of the portfolio would be normalized in 2021, but because of the composition of the portfolio, it would still have a lot of MBS and some longer-duration securities.

VICE CHAIRMAN DUDLEY. So it would be a longer duration portfolio.

MS. REMACHE. It would be another several years before the composition of the portfolio is also normalized.

VICE CHAIRMAN DUDLEY. I see. Okay. I wanted to understand that. Thank you.

CHAIR YELLEN. President Evans.

MR. EVANS. Could I just ask a question about the presentation? In exhibit 3, you've got the sum of maturities and it has this certain Manhattan-skyline-peak aspect to it, which is getting my attention. That made me go look at a part of Tealbook B I don't look at very often. But I tried to dig up what the SOMA balance sheet holdings would actually look like, and the chart there is consistent with these peaks in maturities, right?

MS. REMACHE. That's right.

MR. EVANS. So you might look at those peaks and expect choppiness. Maybe it's the aspect ratio here, but it doesn't look quite as jagged as I might have expected. Okay. Thank you.

CHAIR YELLEN. President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. In thinking about the normalization of the balance sheet, I have several principles that I would follow. First, balance sheet normalization should be implemented in a way that minimizes the likelihood of returning short-term rates to the zero lower bound. These are things highlighted by both Governor Tarullo and Vice Chairman Dudley.

Second, balance sheet normalization should be conducted to reduce the likelihood of taper tantrum-type disruptions by avoiding large, discrete changes. Our models didn't anticipate the taper tantrum, and I don't think our models will anticipate any effect now. But I don't have a lot of confidence in our ability to predict things that haven't happened in the historical data. In that historical period, we hadn't been at the zero lower bound and we hadn't had a large balance sheet. So I don't think we should have too much certainty about what the effect might be.

Third, we should select and communicate a consistent, understandable redemption path, not necessarily tied to the somewhat arbitrary schedule of roll-offs and prepayments, but sized and timed to allow a smooth reduction in the size of the balance sheet.

Fourth, the plan should be to reduce the balance sheet at a fairly steady and predictable pace, but a pace that produces monetary tightening consistent with our macroeconomic forecasts. Then we could use the federal funds target as the primary tool to respond to economic surprises that affect the forecast. The federal funds rate channel is better understood than the balance sheet channel and the federal funds rate seems the more appropriate tool for making modest changes to the normalization process resulting from surprises in the incoming data. This is very similar to President Williams's point on this.

Fifth, shrinking the balance sheet is tightening. We generally move the federal funds rate in 25 basis point increments. I would prefer the cumulative effect of redemptions over a one-year period to be sized to approximate a 25 basis point change in the federal funds rate.

In general, I envision a combination of funds rate policy and balance sheet reductions that follows the path outlined in the most recent Tealbooks, although with a somewhat more gradual start to the redemption program. That is, we would choose a liftoff date, raise the federal funds rate a couple of times, and, if things go according to plan, begin a tapered reduction in reinvestments after those initial increases. But it's important to retain the sense of data dependence and flexibility as we anticipate this next phase of our normalization. The logic of sequencing our exit so that liftoff precedes redemptions is to ensure the balance sheet actions would not delay liftoff from the zero lower bound. Using that same logic, I suggest raising the federal funds rate target twice before beginning redemption tapering to ensure that we are well off the zero lower bound and that we have dealt with any complications in keeping the funds rate within our target range. In addition, the delay would provide time to assess the degree to which the increases in the federal funds rate are being transmitted to longer-term interest rates and whether our first set of actions has unexpectedly slowed the economy. I would then select and announce a path for redemptions that would reduce the chance of the announcement of balance sheet normalization creating a taper tantrum. I consider the announcement of the tapering process as the third action in our tightening sequence.

After we set the conditional path for redemptions, the criteria for additional tightening of the federal funds rate would be the same criteria I would use for beginning the balance sheet normalization process. I would not tie the announcement to calendar dates. Because earlier estimates of the effect of our balance sheet suggest that $500 billion of purchases was roughly equivalent to a 75 basis point decrease in the federal funds rate, a constant redemption flow of $15 billion a month for a year would translate to roughly a 25 basis point federal funds tightening over the course of a year. When a third tightening appears appropriate, I would announce the beginning of tapering of our balance sheet of $15 billion a month in redemptions. If additional tightening of financial conditions was required, we could raise the federal funds rate at the same time as beginning the tapering process. If the forecast unfolded as in the Tealbook, a gradual approach to tightening would be appropriate and the tapering process would be an alternative to raising the federal funds rate at that meeting.

In terms of the composition of the redemptions, I would start with $5 billion of MBS redemptions and $10 billion in Treasury redemptions. This would minimize the chance that the announcement would cause a spike in mortgage rates. If the housing market was becoming too ebullient, we could increase the proportion of MBS redemptions with or without subsequent increases in the flow of total redemptions.

There is a financial-stability element in determining the size and composition of our redemptions. Do we want to slow the housing sector or steepen the yield curve? We should increase the redemption size or increase the MBS share of redemptions. In fact, the financial-stability tabletop conducted by the COP Financial Stability Committee included a scenario in which two of the presidents involved felt that the redemption or selling of longer-term assets might be one of the potential reactions to an overheating in the real estate market. For this reason, I would maintain some longer-term Treasury securities and MBS in our portfolio to preserve the option of a yield-curve tightening strategy should financial conditions in the future make that a desirable response to financial-stability concerns.

Because our securities redemptions initially would be less than the balance sheet rollover, we also should discuss how the excess rollover funds should be reinvested. If duration is one of the important factors in the effectiveness of the balance sheet as a monetary policy tool, reinvestment should be done to keep the proportion of MBS and the duration of the SOMA account unchanged other than for securities being redeemed. In addition, reinvesting in Treasury bills would tend to offset some of the tightening effects we are trying to accomplish through raising short-term rates. These concerns imply that the reinvesting should be concentrated in somewhat longer duration securities, which would pose complications down the road as it may alter the timing of roll-offs. However, this is something we could perhaps delegate to the Desk. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kocherlakota.

MR. KOCHERLAKOTA. I had a two-hander, which actually is more a question for President Williams or Vice Chairman Dudley, and maybe Governor Tarullo, too. There seems to be an implicit notion that reducing the balance sheet will increase the probability of our hitting the zero lower bound. I couldn't follow that logic. Is it because—maybe I should go with what the Vice Chairman said—we think it would be very costly for us to ever increase the balance sheet again? Because if, when conditions are bad, we just go back up to $4 trillion, then I don't see the argument.

VICE CHAIRMAN DUDLEY. In my judgment, there's not a huge appetite for that.

MR. KOCHERLAKOTA. Okay, if that's the implicit thinking.

VICE CHAIRMAN DUDLEY. The federal funds rate tool is considered a better tool than the balance sheet tool, and so we would prefer using the federal funds rate tool over the balance sheet tool.

MR. EVANS. Governor Tarullo said that explicitly.

MR. KOCHERLAKOTA. So the notion is that once we start reducing the balance sheet, we're going to be very averse to reversing that.

VICE CHAIRMAN DUDLEY. Let's just say that we prefer the federal fund rate tool to the balance sheet tool. It doesn't mean the balance sheet tool isn't present, but we prefer the funds rate tool.

MR. KOCHERLAKOTA. That's fine, but even that doesn't quite get you there, because if you were willing to reverse course and get yourself back up to the amount of the balance sheet we have in place now, whenever you're faced with a shock, then you're in the same place, essentially.

MR. TARULLO. Yes. That's true, but I think what all of us are saying in different ways is, our expectation is that future Committees will be reluctant to use LSAP purchases as a routine instrument of monetary policy, as opposed to in the middle of the worst financial crisis in 75 years. And there's also a little bit of questioning of the relative efficacy of it, too.

MR. KOCHERLAKOTA. Okay. Thanks. That's helpful for me. Thank you.

CHAIR YELLEN. Governor Fischer.

MR. FISCHER. What you say suggests that we don't couch it in terms of when we feel that we've reached a sufficient level of confidence that we don't go back down to zero, but rather when we feel we can comfortably, politically, market-wise, whatever, start engaging in purchases of assets again.

CHAIR YELLEN. Simon?

MR. POTTER. Can I just add one thing? I guess you've done three asset purchase programs. And one of the ways asset purchases work is that you have to hold them for a while. So how you deal with the holdings of asset purchases will be important next time you want to buy assets in terms of the effect they can have.

MR. KOCHERLAKOTA. That's a good point. Thank you.

CHAIR YELLEN. Governor Brainard.

MS. BRAINARD. I think the other way to think about these two tools is simply that we have much greater empirical evidence over a much longer period of time connecting changes in the federal funds rate to macroeconomic conditions. And so, ideally, one would be back in a framework in which one had the ability to use that, and so I think that would be a very strong rationale for preferring it.

CHAIR YELLEN. President Lacker.

MR. LACKER. Thank you, Madam Chair. Much of the staff memo on reinvestment combines discussion of our reinvestment strategy with discussion of how we communicate about our strategy, especially what forward guidance we might provide. In fact, I think it's fair to say the memo is virtually all about the forward guidance regarding our reinvestment strategy, rather than the strategy itself. And I found this a little bit surprising, because just earlier this year we ended the practice of providing forward guidance on our interest rate policy and went instead to a meeting-by-meeting basis for setting policy. And in our normalization plan document last September, we promised to give advance notice about asset sales, but we didn't give any similar promise about reinvestment strategy. So, like President Williams, I found it useful to think first about what strategy we want to follow about our balance sheet and then to think about how we want to communicate about it.

Now, something stood out to me in the memo. The memo provides two scenarios regarding macroeconomic variables—one under an assumption of an early end to reinvestment and the other under an assumption of a later end to reinvestment. The early scenario is taken from the June Tealbook, and so that involves a particular interest rate path, presumably chosen appropriately—or the staff's view of what's appropriate, I'm not going to quibble with that. In the late scenario, the interest rate policy follows an inertial Taylor rule. Now, because a later end to reinvestment by itself entails more accommodative policy, the funds rate is somewhat steeper in the later reinvestment path. But it only partially offsets the effect of a later end to reinvestment. The unemployment path is, accordingly, lower, and inflation, marginally higher.

Now, the staff points out that a funds rate path could be chosen that in the model would completely insulate our goal variables from the balance sheet effects of our reinvestment strategy. I've argued in the past that these balance sheet effects could be quite small, but let's set that aside and just take these effects as given. I think it makes more sense to compare scenarios in which we are under the sort of complete-offset assumption. In other words, under the baseline, we're assuming we're setting interest rate policy appropriately. If we're looking at a different timing for reinvestment, I think the sensible thing is to assume that if we adopted that, we would also set interest rate policy appropriately, and essentially that means projections regarding our goal variables would be invariant under the two scenarios.

So the main effect of the choice of reinvestment is on the path of our balance sheet. We can sort of set aside unemployment and inflation. Now, framed this way, that seems to a first approximation—of course, there are second-order issues, too—the useful way to think about it. To me, the choice seems pretty easy. I think an array of political economy considerations make it attractive for us to normalize the size of our balance sheet as soon as possible—sooner rather than later. I think we'd prefer as small a financial-system footprint as possible while maintaining the ability to accomplish our objectives and live up to our promise not to sell assets. I conclude that we should end reinvestment all at once, and soon. Ideally, a meeting or two after we start raising rates seems reasonable. Under that strategy, the interval between liftoff and ending reinvestment is relatively short, so forward guidance isn't really that important a question.

Now, it strikes me that we could easily make this decision about reinvestment on a meeting-by-meeting basis and, at the appropriate time, simply announce that we've decided to stop reinvestment effective immediately in the same way we announced the beginnings of our quantitative easing programs and the beginning of tapering and the like. That would be consistent with our decision earlier this year to back away from forward guidance on interest rate policy, to go instead to a meeting-by-meeting basis. And I don't see why we need forward guidance on ending reinvestment.

Let me just comment on the discussion about phaseout and market functioning. I have a history of questioning the staff on what they mean by market disruption. I think if we're going to take some step like slowing down the end of reinvestments or delaying on the basis of the staff's conjectures about market disruption, the Committee really ought to have a pretty concrete handle on what in the world that means. If prices move, if they get volatile on a couple of days, if something like that happens, I'm not sure why we should care, and I'm not sure what that should mean to us. If there's something more fundamental, like some computers breaking down, I'd want to know about that—maybe that's worth taking onboard. But I think we need a more concrete account of what "market disruption" means before we actually act on it. Thank you, Madam Chair.

CHAIR YELLEN. Okay. Thomas.

MR. LAUBACH. President Lacker, just for clarification, the baseline scenario is constructed as we always do using mechanically the inertial Taylor (1999) rule. So that does not start with a specific notion of appropriate policy but, instead, just mechanically applies Taylor (1999). We did basically the same in the alternative where the reinvestments continue until the federal funds rate hits 2 percent. For example, in the Risks and Uncertainty section of the Tealbook, we are applying the inertial Taylor (1999) rule to the deviations from the baseline. I think the point that you highlighted—that, in principle, of course, the funds rate path could be adjusted to completely insulate the macroeconomy from the changes in reinvestment policy—is entirely correct. It would just be more complex to run that scenario. So we simply let the policymakers respond to the deviations from baseline according to the inertial Taylor (1999) rule.

MR. LACKER. Right. So I stand corrected in my characterization of the baseline funds rate path. The basic point is true, though. If you're setting policy in one scenario, you can insulate them. More broadly, if you took an optimal policy calculation in the baseline path and then did the same with a different reinvestment policy, you'd get the same outcome, right? This is basically an application of the envelope theory, right?

MR. LAUBACH. Mostly correct, particularly as long as you are away from the zero bound.

MR. LACKER. Right. Again, as a first-order approximation.

CHAIR YELLEN. President Rosengren.

MR. ROSENGREN. Yes. Just to follow up on that. If we were to stop the reinvestments very quickly, we might still be very close to the zero lower bound. So the ability to offset seems a little bit inconsistent with starting the timing almost immediately. You'd be right if there's enough room, but if there's not much room, the ability to offset using the federal funds rate seems quite limited, so I think you'd have to pick one of those two. If you really want an offset, you need enough room to be very confident you're not going to hit the zero lower bound again.

MR. LACKER. This is worth thinking about. In the macroeconomic literature, the standard treatment is that policy is sort of lexicographic, in that you only have the assets you need when interest rates are above zero. When you get to zero, then the balance sheet is what you use. And the presumption in a lot of models and a lot of discussions is last in, first out. On the way up, you're running off the balance sheet and then raising rates. But we're doing something different—for various reasons, we're doing something different. We're raising rates before we're running off the balance sheet, and so we're getting away from that lexicographic corner solution. And I think we need to be clear on why that is and what's constraining us. If interest rates get to 2 percent and we've got a big balance sheet, well, why didn't we buy a lot of assets when we cut rates to 2 percent in 2008? We ought to think about that, I guess.

CHAIR YELLEN. President Kocherlakota.

MR. KOCHERLAKOTA. Yes. I wanted to follow up on President Lacker's attempt to build a theorem of invariants. I think it would be valid except for the concerns we just heard about being willing to raise the size of our balance sheet when we get to the effective lower bound. So if we've cut the size of the balance sheet, whenever we hit the effective lower bound, we're going to have less accommodation because of that cut. So whenever we hit the effective lower bound at any time in the future, because we've reduced the balance sheet—assuming we're unwilling to raise the size of the balance sheet—we're going to have less accommodation.

MR. LACKER. Madam Chair.

CHAIR YELLEN. President Lacker.

MR. LACKER. Will that argument ever not apply?

MR. KOCHERLAKOTA. I think that's an interesting question—which I will touch on later.

MR. LACKER. Should we have $4 trillion for the rest of time?

CHAIR YELLEN. President Evans.

MR. EVANS. Madam Chair, the other lever here in the situation that we're talking about, without regard to increasing the balance sheet, would be once you go up two funds rate increases, you have a little more latitude to indicate we won't necessarily raise rates as quickly as the baseline would, and that would impart more accommodation as well. But that's the environment that you'd be dealing with, one that would not be nearly as strong as we expect when we say we're reasonably confident we're going to get inflation up to our 2 percent target, it seems to me.

CHAIR YELLEN. Okay. President Lockhart.

MR. LOCKHART. Thank you, Madam Chair. In preparing for this round, I, too, tried to ground my thinking in guiding principles. They're not the same as President Rosengren's. I came up with three. First, consistency with the Policy Normalization Principles and Plans document that we published in June 2011 and updated last September. As I read it, the September 2014 document established that reductions in SOMA holdings will be done gradually and predictably, that the timing of ceasing reinvestment after liftoff will be state dependent—that is, on the economic and financial conditions and the outlook—and that it is the Committee's desire to return to a portfolio consisting primarily of Treasury securities, implying that runoff of MBS will be part of normalization from the outset. The document also said we do not anticipate selling MBS. Everybody is familiar with all of those principles. My second guideline is that our reinvestment policy should, broadly speaking, work in support of interest rate policy in pursuit of our dual-mandate objectives. This could be turned around to mean that reinvestment policy should not work counter to interest rate policy. My third principle is, the approach should be simple, uncomplicated, and clear in the substance of policy and its communication. In other words, I don't think our reinvestment approach should risk being too cute.

In the spirit of this go-round, my thinking on the questions is preliminary, not as developed as many of the people who went ahead of me. I lean in favor of what I consider a simple approach with these elements: First, make the decision on the timing of ceasing reinvestments once the mechanics of ongoing interest rate policy implementation have been operationalized and are running smoothly. Second, I do prefer a qualitative, state-dependent guidance approach. Set the timing of starting cessation of reinvestment in light of economic conditions once we're reasonably confident the economy can handle any additional tightening that might come from balance sheet reductions. Third, allow full passive runoff. Even though reductions will vary over time, a published maturity schedule should satisfy the predictability criterion. And review the approach periodically in an attempt to assess considerations such as coherence with the expected path of interest rate policy, the extent the variable schedule of reductions is affecting the potency of interest rate policy, and any effect on market functioning.

The Committee does have other options, as already discussed, of course. For example, monthly reduction could be set as a straight line of equal monthly increments. The mix between Treasuries and MBS could be altered. We've discussed the pros and cons of this idea before. And it's possible to imagine a scheme of tight coordination between interest rate and balance sheet normalization, trying to integrate these two tools into a dynamically set, data-dependent overall policy stance. I'm not warm to these ideas. At present, I'm concerned that over-engineering might produce communication and other issues. So, at this point, I prefer keeping it simple. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Mester.

MS. MESTER. Thank you, Madam Chair. I welcome this initial discussion on how to deal with reinvestments in our SOMA portfolio. And I want to thank the staff for the memo that lays out some of the issues. I found it quite helpful.

I, like President Lockhart, start with our normalization principles. Our September 2014 principles provide some guidance on how the Committee will handle its portfolio, including reducing its size and returning its composition to primarily Treasury securities. We stated in the principles that we plan to reduce the balance sheet in a gradual and predictable manner, primarily by ending reinvestments, that reinvestments will end sometime after we begin raising the federal funds rate, and that the precise timing will depend on how the economy and outlook evolve. Whatever plan we choose should be consistent with these principles. My preference is also to adopt a simple approach, because at this point I don't see any clear benefits to adopting a more complicated one. I think the main issues are determining the starting point for ending reinvestments and determining when to communicate our strategy.

While I would like the balance sheet to return to a more normal size and composition, I don't see a compelling reason to begin this in the very early stages of liftoff. I'd rather the balance sheet remain passive for a time after liftoff, so that we don't encourage the idea that the balance sheet, in addition to interest rates, is a regular or active tool of monetary policy. We've stated that we'll time the end of reinvestments based on the economy. So the further in advance we want to communicate something more concrete about our reinvestment strategy, the less reasonable a calendar-based strategy is, because we don't know precisely how the economy will evolve.

That leaves a state-dependent strategy. Now, one reason I don't think the balance sheet should be viewed as a regular tool of monetary policy is that I don't believe we have estimates of its effect on risk premiums and the real economy that are precise enough to be able to use it in that way. This argues for not setting separate economic conditions for ending reinvestments. My preference would be, for at least around this table, to think about ending reinvestments tied to the federal funds rate. Essentially, this means that the economic conditions for ending reinvestments are the same ones we'll be using to determine the appropriate target for the funds rate. Participants who've said today that they would be comfortable beginning reinvestments after a couple of federal funds rate increases are essentially doing this.

The staff memo illustrates a scenario in which reinvestments stop when the federal funds rate hits 2 percent. Under the Tealbook baseline, this means full reinvestments continue for almost two years after liftoff. That's too long. I'd be much more comfortable ending reinvestments sooner—say, when the fund rate is up to 1 percent. If the balance sheet effects are larger than we thought, then we could adjust the subsequent path of the funds rate after the end of reinvestments to take account of that. If an adverse shock were to hit the economy so that the federal funds rate needs to move back down, we could begin reinvestments again if need be.

One issue that was not raised in the memo is when to convey information to the public about our reinvestment strategy. While market participants are likely to turn attention to reinvestments once we lift off—indeed, there's already some discussion of this by market participants and Fed watchers—I'm not convinced that at liftoff or shortly thereafter we need to say much more about our reinvestment strategy than we've already said in the normalization principles and what will be conveyed in the minutes of this meeting. It would be useful to get the Desk's view on how much advance notice market participants really need in order to prepare for the end of reinvestment.

At some point after we've had experience with raising the federal funds rate, we would announce our reinvestment strategy. If the market doesn't need much advance notice to prepare, then the Committee could introduce statement language saying that if the economy evolves as expected, then we plan to end reinvestments at the next meeting, or at the time of the next federal funds rate increase. We could presage this intention a meeting or two beforehand, similar to what we did when we began reducing our third LSAP program in December 2013. You may recall that at the September 2013 meeting, the Committee introduced language saying that the economic improvement since the start of the purchase program was consistent with underlying strength in the economy, but that the Committee decided to wait for more evidence that the progress was sustainable before adjusting the pace of purchases. It repeated this language in October, and then tapering commenced in December. So we could use a similar approach here if we thought that it was important to give some advance notice.

Finally, with regard to whether to end reinvestments completely or phase them out over time, and whether to treat Treasuries or MBS differently, my initial thought is to keep it simple, like President Lockhart, by ending reinvestments all at once and treating Treasury securities and MBS in the same way. The pattern of redemptions already has some phaseout built in. The macroeconomic effects will be the same whether we announce reinvestments are ending completely or whether we announce a path of gradual phaseout. And as the staff memo indicated, market functioning was not adversely affected by the end of our first LSAP program in March 2010, when the SOMA net purchases of MBS fell more than $40 billion. Indeed, ending reinvestments might aid market functioning because it will mean there will be more safe assets available for collateral and repo in the hands of the public. In addition, market participants know the CUSIPs in our SOMA portfolio. So once we announce when reinvestments will end, they'll know the path of Treasury redemptions, and they'll be able to estimate the path of MBS redemptions.

That said, the MBS market has changed over time, and the Desk estimates that MBS prepayments are expected to be about 30 percent of TBA gross issuance in 2016, requiring the private sector to absorb a large portion of the market. Further analysis by the Desk of the risks of ending reinvestments all at once, rather than phasing them out, would be helpful. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Fischer.

MR. FISCHER. Thank you, Madam Chair. When I first started thinking about when to cease reinvestments, my instinct was that we should decide based on current and expected economic conditions. After all, the size of the balance sheet is a monetary policy tool, and so it should be chosen in the same deliberate and comprehensive way in which we make federal funds rate decisions, or that we used to purchase the assets in the first place through our various QE programs. So I was fundamentally in the state-based camp, and I wanted not to tie us down too much before it was necessary.

However, the more I thought about it, the more I realized that a lot depends on how powerful the effects of announcing the dates and conditions for the end of reinvestments will be. To a first approximation—maybe a bad one, but it's an approximation—one can say that announcing the schedule for sales, when it comes, will be equivalent to a given basis point increase or decrease—I'll explain that in a minute—in the federal funds rate. But that isn't quite right. The markets have an expectation of how large the balance sheet will be at each future date. If our announcement is that we're going to go early relative to those dates, we'll be tightening. If we go late relative to those dates, we'll be easing. Further, if the markets have reasonable foresight, we get most of the reaction with the announcement, and then carrying it out doesn't have as much effect as one thinks. The less foresight people have, the more one has to take into account all of the effects that President Rosengren indicated a few minutes ago.

I think, at the very general level, our principle is that we should go late with the announcement and with the beginning of the running off the portfolio. I say that because I think that the main thing we've got to avoid is getting back to the zero lower bound. One of you said that we want to go up using the two tools so we get to an interest rate that will make us feel comfortable about not going back.

Now, let's go to the key point. How big will these effects be? I was surprised to hear President Rosengren talk about a 75 basis point effect, measured in terms of an equivalent move in the federal funds rate, of some aspect of phasing. I've seen no evidence that we'll be anywhere near as powerful as that in the timing of selling off different parts of the portfolio. I'm not quite sure of the empirical significance of the lower right-hand chart in exhibit 1 of the handout that we got on SOMA reinvestment policy, but it does suggest that waiting a year doesn't make much of a difference to interest rates at any time. I also think I've read a paper or heard a statement indicating that the effect of the running off the portfolio will be in the direction we all believe—namely, that a larger portfolio is more expansionary, but that the size of the effects will be relatively small.

I think we have to ask the staff to tell us how powerful this is. If the whole thing is worth the equivalent of 25 basis points in running down from $4 billion to $1 billion, that's not huge. One is tempted to say, "Well, we should just reverse the results of our empirical work on the effect of quantitative easing—unless there's quantitative lack of easing—and then we'll get the right answer." But there's so much expectation in these things regarding what you're saying about future policy that I'm really not sure that you could just do that reversal and say, "That's what's going to happen." And the question is, what message are we sending now?

I'd announce the beginning of the nonreinvestments relatively late to give us a safety cushion with regard to going back to zero, which I think for a variety of reasons is a problem. I agree with those people who've said we really don't want to go there. And the reason I reached that conclusion even before this discussion was, I've hardly heard anybody say around this table when bad news comes in, "Okay, guys, let's do another QE." In fact, it seems to have just fallen off the table, and I assume that reflects the conclusions we've all arrived at. If these effects are powerful, we're going to have to have some more work by the staff telling us how to coordinate these two instruments. What do we expect when we sell off at a given rate? If we expect very little effect, we don't have to worry very much, and we can just fix it. If it's powerful, then we're going to have to think about what we're doing at each stage.

In the end, because I believe the effects are relatively small, I'll end up with quite a few of you. I'd give President Lockhart the prize for the most apt analogy in this FOMC meeting. I've never thought of programs for reinvestment as being cute, but I'm very pleased to think about it. We don't want to be too cute if it isn't that important. If it is that important, we'll have to be a little cuter, and then go into all of the elements that President Rosengren—and, I think to some extent, Governor Tarullo—mentioned. Again, whether that very sophisticated analysis you gave, Governor Tarullo, is going to be the essence of what we do, or an aspect of what we do, depends on just how powerful this tool is that we're going to be using.

So what I'd like to ask for is that the staff come back with some quantitative stories about what will happen, or what they expect will happen, or the range of things that could happen, depending on the strategies. If you can say this doesn't matter at all, then we could do it on other grounds. If you say this really matters, then we'll have to do a lot more thinking. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Evans.

MR. EVANS. Thank you, Madam Chair. I prefer the qualitative state-dependent approach to initiating changes to our reinvestment policies. However, once we start, I think there should be a high hurdle for making changes in the pace of our balance sheet reductions.

Before we being altering our reinvestments, I think we should be well under way in the funds rate normalization process, and I think this is the biggest issue. I think a lot of what we're talking about comes down to this: We don't know the effect of the balance sheet adjustments and how they are going to affect longer-term rates, and that translates into some equivalent increase in the funds rate. If we get to a point at which the funds rate is high enough, there's some offset that can be done with the funds rate itself or the funds rate path trajectory—somebody said this earlier as well. So once we get to the point when the funds rate is a viable separate tool, I think it takes care of a lot of these issues. By that time, I expect everything should be working smoothly, with a strong economic outlook and inflation rising toward 2 percent. I thought Governor Tarullo's comments on the Bank of England guidance along these lines of the policy rate being high enough were particularly appropriate and helpful.

At that point, we should follow through on our stated goal of returning to a traditional policy environment in which adjusting the funds rate is our primary tool for monetary policy. This would mean putting our balance sheet reductions on "cruise control" as much as possible. We should do this in accordance with our exit-principles statement that we will reduce security holdings in a gradual and predictable manner.

I hope we won't need to adjust our reinvestment policies regularly, and certainly not as another policy lever, if things are going well. This means that before we begin to cease reinvestments, we ought to be reasonably confident that we will be able to adequately respond to future shocks through adjustments in the funds rate. This judgment regarding how high the funds rate needs to be before we alter our reinvestments is going to depend on the evolution of the economic environment and undoubtedly will have an aspect of "we'll know it when we see it." This leads me to think that the best starting rule for ending reinvestments is one that is qualitative and state dependent.

On the other questions, I defer judgment to the Desk on how best to engineer the gradual and predictable reduction in the balance sheet. From the memo, I infer that the Desk would prefer to taper reinvestments, at least for a while, to insure against market disruption. I'm fine with this at the start and understand that we may have to treat MBS differently from Treasury securities. But we should communicate that any decisions regarding the tapering process are dictated by market-microstructure and potential market dislocation considerations and not by macroeconomic monetary policy concerns. We don't want markets to confuse technical adjustments with changes in the stance of monetary policy. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Thomas.

MR. LAUBACH. Perhaps just as a brief clarification, because there have been some questions about our estimate of the size of the macroeconomic effects of these changes in reinvestment strategies. Beth's handout was only showing the comparison of the path for the federal funds rate. For those of you who have the memo, on the third-to-last page, page 15, there is exhibit 2. That shows you that, using the staff's methodology, the difference between the two examples shown in the memo is effectively governed by the integral of the area between the two lines under the alternative paths for the SOMA holdings. When you then go to page 15 of the memo, you see roughly what the effect of that is. For example, on the unemployment rate, it's roughly on the order of 0.1 percentage point at its peak. So after a couple of years, the unemployment rate is about 0.1 percentage point lower.

Now, again, the point applies that President Lacker made beforehand—namely, in principle, of course, you could adjust the federal funds rate so as to completely insulate. So if you started off with some path of the unemployment rate that you had previously determined to be optimal, you could, away from the zero lower bound, adjust the funds rate so as to insulate the economy completely from any changes in reinvestment strategy.

But just to provide an order of magnitude, if you chose the differences in the path of the SOMA holdings and funds rate as shown in the memo, then that would be the resulting maximum effect on the unemployment rate.

MR. POTTER. So that's in FRB/US?

MR. LAUBACH. That is in FRB/US. There are a lot of caveats concerning this, obviously. In particular, of course, it relies on the staff's methodology that the effects result primarily from the stock of our holdings, and are being transmitted through term premiums as we estimate them. I will readily admit that there is a lot of uncertainty about that. But those are our ballpark estimates.

VICE CHAIRMAN DUDLEY. And you have to also think of all the alternative paths that are foreclosed once you start to end your investments. You sort of feel the ending reinvestments decision is not easily reversed. You're then forestalling all those paths where you would've kept the balance sheet higher for a much longer period of time, and that's not really captured completely in the model because the model is based on creating one path. It's not based on creating multiple potential outcomes.

CHAIR YELLEN. That's true.

MR. LACKER. Madam Chair, if I could follow up, just back to the deterministic path—there's some offset in here. So you were describing the combined effect of the balance sheet difference and being partially offset by a funds rate path.

MR. LAUBACH. That's correct.

MR. LACKER. So this isn't pure balance sheet.

MR. LAUBACH. As you can tell, under the path with the later end of reinvestments, the federal funds rate does rise a little bit above the baseline.

MR. LACKER. Virtually opposite.

MR. LAUBACH. Exactly. And that has primarily to do with the inertial nature of the rule that we're using.

CHAIR YELLEN. President Rosengren.

MR. ROSENGREN. Just so I understand the calculation—so there were some estimates when we were going into the quantitative easing. Are you assuming going out is symmetric so that it's primarily a balance sheet effect, not a flow?

MR. LAUBACH. Correct.

MR. ROSENGREN. And that the sizes that were relevant going into QE—the estimates that you're basing this on—are basically the same, roughly approximate size that you would have if you do it in reverse, is that right?

MR. LAUBACH. Correct.

MR. ROSENGREN. Thank you.

MR. WILCOX. And I don't remember the chronology exactly, but the estimates of efficacy that we started out with at QE1—I don't know what it was called back then—those were scaled back twice, is my recollection. It is symmetric now, albeit smaller than what we told the Committee at the dawn of large-scale asset purchases.

MR. POTTER. It's the same modeling approach, David. The MBS is sort of put into that framework, and one of the uncertainties is on the MBS side because it's been harder for us to model that.

MR. WILCOX. Yes, but I think initially we were more optimistic about portfolio effects.

MR. POTTER. Oh, completely.

MR. FISCHER. David, is that an adjustment you've made before thinking about the reverse operation?

MR. WILCOX. No.

MR. FISCHER. You're maintaining symmetry.

MR. WILCOX. Correct.

MR. LAUBACH. Much of that adjustment had to do with the difficulty of estimating how asset prices other than, for example, 10-year term premiums respond. In particular, in response to the first asset purchase program, those responses seemed to be very large. Subsequently, we thought we observed somewhat smaller asset price responses like the stock market and, therefore, scaled back.

MR. POTTER. So one thing we could do is calibrate under those different responses so you could see that.

CHAIR YELLEN. Okay. I'm going to suggest we take a break at this point and eat [laughter] to fortify ourselves for this afternoon. I suggest we take until 1:15 and return to continue the go-round. I believe lunch is available next door, as usual.

[Lunch recess]

CHAIR YELLEN. Okay. Let's continue our go-round with President Harker.

MR. HARKER. Thank you, Madam Chair. As others have said, I believe that once we've achieved a degree of comfort regarding our ability to control short-term market rates, we should begin to reduce the size of our balance sheet. I see little reason to decide today when that will be. In my view, the process that governs the shrinking of the balance sheet should be simple, straightforward, and kept, as President Mester said, distinct from direct adjustments to monetary policy accomplished through changes in the federal funds rate target. It should be calendar based, I believe, but at a date announced after liftoff when we are confident that we are well away from the lower bound. It should be independent of economic conditions, and reductions in the balance sheet should proceed at a fairly constant pace.

To avoid the volatility associated with simply ceasing reinvestments, we can, for example—and as others have mentioned—choose a pace that reduces the amount of longer-term Treasury securities and MBS at somewhat less than the average value of anticipated monthly reinvestments. Doing so would involve outright sales in some months and reinvestments in other months in order to hit the preset target. Proceeding in this manner would make the evolution of our portfolio transparent and avoid the complications that would accompany treating portfolio adjustments as a complementary tool of policy. There's too much uncertainty surrounding the effects of balance sheet manipulation to treat the normalization of the balance sheet in a way that mimics the normalization of our primary policy instrument, in my opinion.

This ends my attempt to answer the questions posed to us. President Williams, consider this my rookie mistake. [Laughter] Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President George.

MS. GEORGE. Thank you, Madam Chair. Overall, I support a qualitative state-dependent approach to ceasing or phasing out reinvestments so we preserve optionality and managing decisions about the funds rate and the balance sheet. To convey the likely timing of the start of balance sheet normalization, I would be open to having the minutes convey views, to having the Chair speak to this at future press conferences, or to considering whether the SEP could be a possible communications vehicle. The table reporting the appropriate timing of policy firming in figure 2 could be replaced with a table reporting participants' judgments about the appropriate time at which to begin to cease or phase out reinvestments once liftoff occurs.

In terms of the policy itself, I would prefer not to distinguish between Treasury securities and MBS. In the longer run, I view a Treasury securities-only portfolio as most appropriate. For that reason, I would not want to further concentrate our holdings of MBS. And in light of uncertainty about how the market will respond to any adjustments in our reinvestment policy, I support gradually phasing out reinvestments over time. After we announce the beginning of balance sheet normalization, I continue to support the approach in the normalization principles that reductions in our securities holdings will proceed in a gradual and predictable manner. If possible, I would prefer to have adjustments to the pace of the phasing out of reinvestments being perceived as predictable rather than as subject to deliberations on a meeting-by-meeting basis. The approach during the taper of asset purchases, where the process was put essentially on autopilot, barring any major surprise in the data, is relevant here. Thank you.

CHAIR YELLEN. Thank you. First Vice President Holcomb.

MS. HOLCOMB. Thank you, Madam Chair. I share perspectives that several others have expressed already today. As others have said, because the Committee has communicated that the timing of the cessation or phaseout of reinvestments will depend on the economic and financial conditions and the evolution of the economy, a pure calendar-based approach might be seen as a departure from that commitment. That said, once we begin reducing the size of the balance sheet, we also should be consistent with the statement that we will do so in a gradual and predictable manner. I take this second commitment to mean that once we actually begin reducing the balance sheet, we intend to rely on changes in the path of the federal funds rate rather than in the pace of balance sheet reductions for marginal adjustments to the amount of policy accommodation provided.

In qualitative terms, then, balance sheet normalization should not begin until we are reasonably confident that we won't have to reverse course in order to avoid jeopardizing progress toward full employment and price stability—that is, until we are reasonably confident that subsequent policy adjustments will be achievable through manipulation of the federal funds rate. The Federal Reserve Bank of Dallas staff suggests a comfortable point would be 75 to 100 basis points of leeway. Once the funds rate target is 75 to 100 basis points, or perhaps 100 to 125 basis points, it would seem reasonably unlikely that the zero bound would become a binding constraint on policy. In sum, I would support a specified funds rate threshold for beginning balance normalization rather than calendar-based guidance or guidance based on a set of economic criteria that might be complicated or confusing.

On the second question—and, as a rookie, I guess I can answer the second question—we do make a distinction between the treatment of Treasuries and MBS. The Federal Reserve Bank of Dallas view, as you may have heard in the past, is that the Federal Reserve should not play an ongoing role in providing support to the housing sector. If housing finance remains difficult for certain groups of potential buyers, it is not the result of temporary liquidity problems but due to deliberate, nonmonetary regulatory and policy decisions. Nor do we see a rationale for continuing purchases of MBS as a countercyclical measure. By the time the process of balance sheet normalization commences, we are likely to be at or very near full employment, with price stability in view. Accordingly, I favor as rapid an end to MBS reinvestments as is possible without disruption to housing finance. Ending reinvestments completely as soon as balance sheet normalization begins would be ideal, with MBS holdings being allowed to run off until they reach de minimis levels.

I would lean toward shrinking the balance sheet by a steady, predictable amount each month initially, consistent with our normalization pledge. Looking at exhibit 4, a reduction of something like $20 billion to $25 billion per month appears realistic. We would see this as made up of sharp cutbacks on MBS reinvestments supplemented with enough of a scale-back of our Treasury securities investments to reach that level. Thank you.

CHAIR YELLEN. Thank you. President Bullard.

MR. BULLARD. Thank you, Madam Chair. I have a view that picks up on themes that have been mentioned during the morning, but some aspects of what I will say are different from almost everybody. My argument has four parts. First, I think the balance sheet adjustment has proven to be a potent monetary policy tool, so I will talk about that. This is a little bit in answer to Governor Fischer. Second, I think we should admit that it's a potent tool when we are thinking about returning the balance sheet to a more normal size. Third, "potent tool" naturally means it needs to be managed carefully. I think that means the adjustment should be state dependent. A lot of people are saying it should be state dependent here this morning. Fourth—and this hasn't been emphasized as much—we have an existing policy expectation, which is that we will cease reinvestment six months after liftoff. My conclusion is: We should choose a policy that is consistent with the existing expectation, but which is state dependent. Let me elaborate on these points.

Regarding the balance sheet adjustment as a potent tool, surprise moves with respect to balance sheet policy have had large consequences, and the taper tantrum episode in the summer of 2013 is one important case for this Committee to consider. Strictly speaking, the tantrum itself only involved changes in expectations of balance sheet policy, not any actual change made by the Committee either at the June 2013 meeting or at the September 2013 meeting. Nevertheless, there were large ramifications, both in the United States and globally, on the order of 100 basis points on longer-term interest rates. This is quite a big effect, indeed. I think the staff's models are likely understating potential effects on markets and on the economy that could come from changes in balance sheet policy. Also, the international evidence on balance sheet policy suggests important effects coming from the Bank of Japan's most recent efforts and, certainly, the ECB's most recent efforts.

My first point, then, is that this is a potent tool. And I think we should be clearer that this is the case as we discuss this, because there is a lot of schizophrenia around the table. Some people think, "Oh, these are really small effects." Well, if you think they're small effects, then don't worry about it. It doesn't really matter when you normalize. If you think they are big effects, as Governor Fischer was saying, then you have to be a lot more careful about it.

Second, I interpret the staff simulations to suggest that if we manage the balance sheet down in a way that does not differ materially from current market expectations, then the effects will be minor. It is not that everything you do with a balance sheet causes big effects. It is only if you deviate from the current expectation, which is what the taper tantrum was. We should expect small effects as long as we do something pretty consistent with existing expectations. There is the potential for the effects to be large, and large effects would interfere with our policy rate normalization.

Third, because the balance sheet policy is, in principle, quite potent, it needs to be managed carefully. As many of you know, I have long advocated managing the balance sheet in response to economic conditions. That means I am going to be in favor of a state-dependent approach. I do not recommend going to numerical values. That doesn't sound like it's getting too much support today. A qualitative state-dependent approach, as advocated by President Dudley and others, would be what I'm advocating.

And fourth, as Governor Fischer talked about, we already have an existing balance sheet policy expectation built into financial markets, which is that we will end reinvestment six months after liftoff. In my view, this policy is inappropriate. It's too calendar based, and it does not smooth the balance sheet decline appropriately. At the same time, I interpret the Committee's sentiment to be that we do not wish balance sheet policy to interfere with the policy rate normalization process. And I am sympathetic with President Lacker's comment that you should be able to do this in such a way that you choose the optimal rate path, for an announced balance sheet policy, and that the implications for inflation and unemployment are exactly the same as they would otherwise be.

I think that is how we want to think about it: We want to have primacy for our policy rate normalization process, and, therefore, we want to push balance sheet policy into the background, which is fine. And we do not want some type of tantrum, moving longer-term rates either higher or lower than they would otherwise be in response to unexpected changes in the Committee's balance sheet policy stemming from an announcement that we might make that this would be forthcoming. Such an outcome would interfere with the intended effects of the Committee's main policy normalization, which would be taking place through interest rate increases.

So, what's the bottom line? The task for the staff, as I see it, is to devise a smooth state-dependent strategy for this Committee to use to manage the balance sheet down to a lower level. A simple version would be for the Committee to state that, provided the economy continues to make progress toward our goals, the Committee's intention is to smoothly reduce the size of the balance sheet by a fixed amount—let's say, $30 billion per month—at the appropriate time, but that the step size may be reduced if negative economic shocks occur and may be increased if positive economic shocks occur. This would presumably be close to the current market expectation and, therefore, would be unlikely to cause significant reaction in markets.

Given the Committee's past choices, the decision to change the pace of the manage-down would not be likely. But it would be an important option if a major shock were to be encountered. And surely if a major shock were encountered, probably the first thing we'd do is end reinvestment. So I think you have to think about the ability to change the pace of "manage-down," and I know several others around the table have said similar things. As I see it, the "manage-down" would allow to MBS run off. The smoothing would be achieved by appropriately choosing Treasury securities purchases, sales, and reinvestment to achieve the given target, given the maturities on that particular month. This is just one possible approach, but it gives us one example to look at.

In summary, the balance sheet is a potent tool. It should be managed smoothly and in a state-dependent way. One goal is to stay close to current market expectations concerning reinvestment, so that interest rate normalization is not derailed. A simple way to achieve these goals is to name a pace of reduction in the balance sheet itself but to retain the option to change that pace of balance sheet reduction in response to economic conditions. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kocherlakota.

MR. KOCHERLAKOTA. Thank you, Madam Chair. I found this morning's conversation regarding the thinking about this issue of halting or phasing out reinvestments very useful and interesting. I thought the discussion that once we reduce the balance sheet in size, there are big costs to reversing that reduction should really bear materially on our thinking about our policy in this space. One way I am thinking about it is that reducing the balance sheet, because we are reducing the amount of accommodation that would be in place when we hit the zero lower bound, is not that different from raising the effective lower bound itself. If we hit the zero lower bound with a $4 trillion balance sheet, we have a certain level of accommodation in place. If we hit the zero lower bound with only a $3 trillion balance sheet, we have considerably less accommodation in place. Another way to think about that is, we should be comfortable lowering the balance sheet when we are comfortable with the idea of raising the effective lower bound.

Now, a couple of us—President Rosengren and I—have talked about our concerns about hitting the zero lower bound even in the longer run. I think that makes you think about what our long-run goals for the balance sheet should be. I think we are sort of in this autopilot mode of thinking, "Boy, we should just get the size of the balance sheet back to 2005. That would be a good thing, because 2005 was a really good time." On the other hand, 2005 was only three years before 2008.

MR. TARULLO. And two before 2007. [Laughter]

MR. KOCHERLAKOTA. Yes. Thank you, Governor Tarullo. That was helpful. I think we should be thinking more systematically and deliberately about what we want our long-run balance sheet to look like. If we are really averse in the longer term to the idea of ever increasing the size of the balance sheet because of the institutional or political risks that others have mentioned, I think that consideration really should shape our thinking about what that long-run balance sheet should be. And I think it should also be shaping our thinking about when to initiate the phaseout of reinvestments. I will say a couple of words about that in a minute.

The other point—and this has come up a little bit, but I'll try to emphasize it a little more—is that the amount of accommodation associated with our balance sheet—the size and duration of our holdings—is not shaped by the rate of change of the size of our holdings. So when we think about reinvestments, I think it's important to be doing that in terms of how they are affecting the size and composition of the balance sheet, not in terms of reinvestments per se. This probably matters the most in terms of mortgage-backed securities. Because they are redemptions, we are delivering pro-cyclical variation in accommodation. You can imagine households and businesses becoming more pessimistic about the prospects for the economy, of interest rates falling, and of mortgage refinancing increasing. As the mortgages underlying those securities in our portfolio are prepaid, our balance sheet shrinks at a faster-than-expected rate. So we are removing accommodation exactly when we need it. I think we want to be careful in thinking about reinvestment not in terms of the flow of reinvestments, but rather in terms of how it is affecting the stock of holdings on the balance sheet.

Those are my high-level points. I think we should be thinking more about what our long-term goal is in terms of the balance sheet, especially in light of what I hear, which is a feeling of concern regarding, or aversion to, initiating a new asset purchase program. And we need to carefully reformulate our reinvestment policy to serve our balance sheet policy. That long-term goal, as I hinted at earlier, really should not just be shaped by a desire to get back to normal times. I think we should be taking into account the fact that we a very bad outcome occurred that we didn't anticipate, and we should be keeping in mind that, as we go forward, we might want tools to deal with that kind of outcome.

Let me turn to the questions—though, having said that, I suspect I won't be answering the questions because I am not a rookie. I like the idea of a state-based approach. A lot of you have talked about the challenges in communicating effectively about a state-based approach. A couple of people—I remember President Mester doing this, and I think First Vice President Holcomb also mentioned this—suggested that we tie the initiation of phaseouts or reinvestments to the path of the federal funds rate. So we could announce very soon that the phasing out of reinvestments will begin when the target range of the federal funds rate hits *X* percent. Now, what should *X* be? Here I would disagree with some of the numbers I heard earlier. I've heard people would be comfortable with numbers like 1 percent for the target for the federal funds rate. Remember what I said at the very beginning: When would you be comfortable raising the effective lower bound for interest rates? Maybe you're comfortable with that prospect at 1 percent. I myself would not be. I would think we would want a higher target range for the federal funds rate before we go through the relatively irreversible process of shrinking the size of the balance sheet. I think the staff could be helpful on this by giving us some simulations that would show us a probability of hitting the zero lower bound if we are at 1 or at 2 percent. I think that it could provide an analytical framework for the Committee to think through those matters. At that point, once we start, I would just announce that the evolution of phaseouts of reinvestments would depend on the evolution of the economy.

Now, if you go with my 2 percent target range for the federal funds rate, that actually gives the Committee quite a bit of time to work on the details of the phaseout strategy. Before you do that, though, I think a key part of that work is to settle as much as possible what the long-term vision for the balance sheet is. President Rosengren mentioned that the Conference of Presidents' Financial Stability Committee went through a tabletop exercise in which two of us saw that actually selling assets might be a useful way to respond to a particular financial stability risk. Well, if you want that as part of your vision, it should be affecting the size of your balance sheet. If you are averse to ever buying assets again, that should be affecting the long-term size of your balance sheet. All of these things should be going into thinking about where you want to be headed.

Focusing on the size and the composition of the balance sheet, focusing on the long-term goals, and not being comfortable with initiating reinvestments until such time as you are really comfortable with the idea of raising the effective lower bound on interest rates—those things should be connected in our thinking. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Tarullo.

MR. TARULLO. Thank you, Madam Chair. Narayana is quite right. He, Eric, and a few other people over time have alluded to the possible desirability of an end state in which we have a larger balance sheet and one that may have different-duration securities in it. It feels like the next several meetings are going to be potentially full enough that we probably would not have enough time to debate something like that. But should we try to set, at some point, a discussion of that particular issue a little bit apart from the immediacy of decisions about liftoff?

CHAIR YELLEN. Let me just say that the staff have embarked on a project that will concern our long-run framework and will take up these questions, and I planned at the end of the meeting to tell you a little bit more about that work plan. But I think that is very important. The staff is thinking about it, and we hope this will be a project that will involve a lot of staff around the System. We'll be giving you a bit more information about what our expectations are.

MR. KOCHERLAKOTA. Thank you.

CHAIR YELLEN. Governor Powell.

MR. POWELL. Thank you, Madam Chair. I want to start by distinguishing between two things. First, there is clearly a need to have a decent answer to the question of when reinvestments will end, and that need will ripen no later than the liftoff press conference. Second, there is the need to decide a whole range of questions about the exact timing, whether we do it all at once or taper, whether we distinguish between Treasury securities and MBS, and whether the taper is a complex or a simple one. And most or all of that, I think—though we are talking about it today, and it will go into the minutes and season people's thinking—is not ready to be decided and won't be for some time. The way I think about this is that one of the purposes of the first statement, what will be said at the press conference, is to clear space and time to allow the normalization process to proceed and give the Committee the information it needs to make those decisions when they need to be made.

Today the public seems to think that the Committee intends to wait somewhere in the range of 6 to 12 months before ending reinvestments either through a taper or perhaps all at once. The primary dealer survey suggests a reasonable likelihood that we would taper over the course of a year. Those are pretty reasonable parameters, they could be about right, but I don't see how it is in the Committee's interest to harden those expectations in the near term. I'll offer two reasons for caution.

First, the model shows only a very slight effect on rates from ending reinvestment. Actual effects may differ materially from those in the model. And, as many have noted, I think we learned that lesson—and shouldn't forget it—in the taper tantrum, when we sat around this table, and I don't know that there were more people who thought it would be seen as a tightening move or not. I will speak for myself—I certainly didn't see it as predicting the move that we saw in the summer of 2013. These signaling effects are not in the model, and they can be very large or not. I don't expect that there would be much of a reaction from a decision to taper, but I don't see any reason to take that risk unnecessarily. The second reason to wait is that I would really like to minimize the chances of ever having to vote again at the zero lower bound on asset purchases. I think both of those reasons argue for caution.

I think there's even a third reason that hasn't been talked about as much, and that is, the situation has really changed since our earlier discussions on reinvestment. Specifically, the normalization process has slowed down. Liftoff is going to be later than expected, and the pace of increases is going to be slower. I looked back: The median interest rate forecast in the June 2014 SEP showed the policy rate at 1⅛ percent at year-end 2015 and 2½ percent at year-end 2016. Current expectations are far below that. Of course, the reason why liftoff is later and the path is lower is that in June 2014, the central tendency for 2015 economic growth was 3.0 to 3.2 percent, compared with 1.8 to 2.0 percent in the June 2015 SEP. What has happened is, as global economic growth has weakened, other central banks around the world have cut their rates to their effective lower bound, and they seem likely to remain there for several years. They've also embarked on their own asset purchases. And all of this is likely to limit significantly the speed with which we can depart from our own effective lower bound. And unless and until global economic growth moves up significantly, we're very likely to be forced into a shallow path for rate increases, which is risky but is still preferable to the alternative. I don't want balance sheet tightening to make that path any shallower, so it makes sense to me that balance sheet tightening should slow down, just like the other pieces of the normalization process.

As a result, when it becomes appropriate to clarify the Committee's thinking on reinvestment, I would recommend the Committee stress that our focus for now is on the path of the federal funds rate and give only a much more general statement of conditions for shrinking the balance sheet. I would be clearly in the qualitative state-dependent camp. An example would be, "The Committee expects to begin the process of normalizing the balance sheet when it is reasonably confident that the policy normalization process is well established," which is very much along the lines of what the Chair, I believe, has said. I have no attraction to calendar-based guidance, nor do I have any attraction to quantitative state-based guidance along the lines of the thresholds that we used earlier.

When we do begin the balance sheet normalization process, I might prefer a phased-in approach to a sudden stop in reinvestments, and I might want to consider distinguishing between Treasury securities and MBS. I think all of those things are going to be informed by events after liftoff, and I find it very hard to have a thoughtful opinion on them until I see where the normalization process is. I will close by echoing President Lockhart's earlier point about keeping it simple when it comes time to taper. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Brainard.

MS. BRAINARD. Thank you, Madam Chair. The policy framework that we have agreed to over the past year is designed to make the federal funds rate the focal point for our policy stance and to make the IOER the primary instrument for influencing that rate, with the ON RRP a secondary tool. That policy framework has the virtue of being clear and familiar to market participants and the public as well as empirically well understood. In contrast, we have far less experience and little quantitative research to guide us on how reductions in the size of the balance sheet away from the effective lower bound would translate into financial conditions. For that reason, while it is important to reduce the size of the balance sheet over time, I would not want to do so prematurely if that risked any sacrifice to the efficacy of our policy framework.

I would prefer the ceasing of reinvestments to be conditioned on economic developments and based on quantitative rather than qualitative guidance. There have been considerable time and effort over the past few meetings spent informing the public that monetary policy will be conditioned on economic developments. As reinvestments are an important component of policy, it would be confusing for guidance in this area to be conditioned on the calendar.

Quantitative guidance would be clearer and more informative than qualitative guidance. However, guidance based on one or more macroeconomic indicators would be, I think, problematic and confusing vis-à-vis the macroeconomic framework we have set out for the federal funds rate. The simple solution that others have alluded to is to base reinvestment policy on the federal funds rate, which parsimoniously summarizes the Committee's view on all macroeconomic factors that influence the outlook for the labor market and inflation. In addition, conditioning on the federal funds rate maintains the focus on our primary policy tool, simplifying communications. A further advantage is that it guarantees that changes in the IOER and the phaseout of reinvestments will be aligned with one another, minimizing any confusion that might arise from changes to one tool that are not coordinated simultaneously with changes in the setting of the other tool.

Regarding the specifics of the guidance to be provided, my preference would be for our communication to state that an initial reduction in reinvestments would likely occur only after the federal funds rate has reached a range around 2 percent. When rates get into that range, moreover, it may be useful to pause changes to the IOER in order to gauge the effect on financial conditions. The preferred range would be motivated, in my thinking, by several factors. First, like many others around this table, I place a high priority on minimizing the risk that adverse economic developments cause a return to the zero lower bound. Maintaining investments until the federal funds rate is within more normal levels and comfortably above the zero lower bound would minimize that risk.

Now, as we've discussed, the model-based analysis suggests that the direct effect of a delay in reinvestments—until the federal funds rate is within more normal levels—on the term premium and, through longer-term rates, on economic activity is likely to be quite small. Nonetheless, I'm concerned about the signaling effects of an early change in reinvestment policy, which could produce larger effects than we anticipate. In particular, one risk that I would want to keep in mind as we contemplate our reinvestment policy is the risk that longer-run rates behave in an unexpected way that complicates policy, as happened during the taper tantrum. Thus, I prefer to wait on ceasing or tapering until it becomes clear that the headwinds that have limited economic growth to quite moderate levels despite extremely accommodative monetary policy have subsided.

I recognize that agreeing to specific quantitative guidance may be difficult, and I'm open to qualitative alternatives such as the ones that have been stated around this table—possibly referring to a time when the federal funds rate returns to more normal levels, or referring to the wish to minimize the risk of a return to the zero lower bound, or simply referencing normalization. I think the difficulty, though, with any qualitative guidance is that market participants may well interpret it as much sooner or later that we intend, and it will immediately leave Committee members to face ongoing efforts to get us to further elaborate what precisely we mean by those qualitative conditions.

In an abundance of caution, I would probably favor some phasing or tapering so as to avoid any possible effects on market function when the time comes. I might also be inclined to apply the phaseout of reinvestments symmetrically to MBS and Treasury securities, although I must say I'd be open to altering this policy if market conditions suggest it would be desirable to do so when we get to that point. Finally, I do favor communicating clearly our policy framework once these decisions have been made, but I would caution about how we reflect this discussion in the minutes, in order not to get ahead of the policymaking process. Thank you, Madam Chair.

CHAIR YELLEN. Thank you, and thanks to everyone for a very rich discussion. I think this has really been quite an interesting set of considerations we've discussed. You've heard various suggestions about additional staff work that might be appropriate, and I think we will proceed by sitting down with the staff and trying to narrow down a few alternatives based on what we have heard around the table. I'm not going to try to summarize the discussion; I think that probably would be a mistake at this point. But I do hear some congealing of views, and I think we can probably narrow down the alternatives for your consideration and get back to you to have a further discussion on this matter. I think this has been a really useful discussion, and I thank you for your thoughtfulness.

Let's move along, then, to the fourth item on the agenda, which is "Potential Enhancements to the Summary of Economic Projections." And I'd like to call on Governor Fischer to start us off on this topic.

MR. FISCHER. Thank you, Madam Chair. The subcommittee on communications consists of Loretta Mester, Jay Powell, John Williams, and myself, and we have been considering various enhancements to the SEP. Today we are coming to you with a fairly modest initial proposal, which mainly consists of adding medians to the SEP materials in September. I wasn't here when FOMC participants considered SEP enhancements in January 2013, but the transcript suggests that adding medians of participants' responses was the most popular of the proposed changes at that time. The subcommittee continues to think it's a good idea, and I hope that most of you will think so, too.

You received a memo last week on this topic written by Todd Clark from the Federal Reserve Bank of Cleveland and Ellen Meade from the Board staff, who are sitting opposite us. It was a short memo, as these memos go, and so perhaps you all had a chance to read it. [Laughter] In a moment, Todd is going to review for you the subcommittee's proposal and some of our ongoing work, and afterward we'll have time for any remaining questions or suggestions you may have. Todd, please.

> MR. CLARK.[4] Thank you, Governor Fischer. I will be referring to the handout titled "Materials for Briefing on Potential Enhancements to the Summary of Economic Projections." That handout includes a first page that has an outline of my comments and then some graphics that correspond exactly to those included in the staff memo circulated to the Committee last week.
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> As Governor Fischer indicated, and as the cover memo from the subcommittee indicated, the subcommittee has identified two broad, promising enhancements to the SEP. The first is the addition of median projections, and the second would be the addition of fan charts to illustrate forecast uncertainty. At this time, as I will detail, the subcommittee is recommending the addition of medians and one other change to the SEP, which concerns the federal funds rate projections in figure 2. The subcommittee intends to come back to the Committee later this year with a recommendation regarding fan charts, and I will conclude with a brief review of staff work on those fan charts.
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> In their current form, table 1 and figure 1 of the SEP provide the full range and the central tendencies for the macroeconomic variables that are included in the projections. In the absence of a median or some other central value, public commentary has tended to focus on the midpoints of the central tendencies as measures of participants' collective view of the outlook. Figure 2 of the SEP provides the "dot plot" for the federal funds rate. This dot plot does not report a median projection, but it is pretty easy to identify the median projection, and public commentary makes some use of that median. Finally, in the full SEP materials that are published three weeks later along with the FOMC meeting minutes, figure 3 provides histograms for all the macroeconomic variables and the federal funds rate. And from those histograms, medians can be computed for each of those variables.

[4] The materials used by Mr. Clark are appended to this transcript (appendix 4).

The basic rationale for including medians in the SEP would be to improve the Committee's communications by providing, in a more direct way, a measure of participants' collective view of the outlook and appropriate policy. The median is a robust statistical measure of the center of a distribution. It is more standard than the midpoint of the central tendency that some of the public uses today. Publishing the median as a summary measure of the collective view would help illuminate that collective view and would foster the public use of that median in summarizing the Committee's projections.

To incorporate medians, the subcommittee recommends revising both table 1 and figure 1 of the SEP. The proposed new table 1, which is shown on page 2 of the handout, adds columns that would provide the median projections. It also includes the federal funds rate as a memo item and an expanded title that makes clear the conditioning of the projections on participants' assessments of appropriate policy. Since we prepared these materials, President Lacker has offered a suggestion that the subcommittee believes to be helpful, and that would be the insertion of the word "projected" before "appropriate" in three places: In the memo line, instead of "appropriate policy path," it would be "projected appropriate policy path," and then the same "projected appropriate" would appear in the first red sentence in the notes to the tables. The point of President Lacker's suggestion was to emphasize the endogeneity of policy—that there is a reaction function, and policy will respond as the outlook changes, et cetera. The subcommittee believes that President Lacker's suggestion will be a useful change. Finally, in terms of medians, in the proposed figure 1, which is shown on page 3 of the handout, thick red lines have been added to report the median projection in the case of each of the macroeconomic variables.

The subcommittee recommends implementing these changes with the September 2015 SEP. The minutes of the July meeting will report on the discussion of medians that we are about to have, and those minutes could also review the proposed addition and its rationale, along with a summary of the discussion that occurs today. If participants favor adding the median, then over the intermeeting period, staff will develop and provide complete mockups of the full set of materials—including tables, charts, and text—that would be warranted by the addition of medians.

The other change to the SEP the subcommittee is recommending today concerns figure 2, which is shown in its current form on page 4 of the handout. The top panel provides a histogram of participants' views on the appropriate year of liftoff. The bottom panel provides the dot plot. The start of normalization will make the top panel obsolete, and the subcommittee recommends removing that top panel at that time. The dot plot, on the other hand, in the bottom panel has been useful for communicating policy views in the period since policy has been constrained by the zero lower bound. Looking ahead, the subcommittee believes the dot plot is likely to remain useful for communicating policy and recommends retaining it even after we're well away from the effective lower bound.

Finally, the subcommittee believes that adding fan charts to the SEP would help communicate the considerable uncertainty that attends the Committee's projections.

> The staff is currently working on fan charts that would be centered on the median projections, with uncertainty bands constructed based on historical forecast errors from a range of public and private sources. Fan charts of this form would provide a quantitative illustration of the historical uncertainty that would complement the judgmental assessment of uncertainty that the SEP currently includes. Fan charts would likely be more effective for communicating the historical uncertainty than the root mean squared errors that are currently provided in a table in the SEP and thereby should help to reduce the public's occasional confusion of forecast uncertainty with the range of views across FOMC participants. In light of these potential benefits, the subcommittee plans to come back to the Committee with a concrete proposal later this year after resolving some technical issues, some of which require further investigation by the staff. That concludes my prepared remarks. Ellen and I would be happy to answer any questions you might have.

CHAIR YELLEN. President Mester.

MS. MESTER. Thank you, Madam Chair. I would like to thank Todd and Ellen for their work. There are a lot of other staff members also involved in this project, and I want to thank them for that, as well as the subcommittee members.

I think the changes we're proposing for our September Summary of Economic Projections are very small ones, and because of that they pose little announcement risk. But I do think they are an enhancement to the SEP. As Todd said, right now the midpoint of the central tendency is sometimes a focal point in the discussion of the SEP. And in lieu of actually constructing a consensus forecast—which is still one of my aspirational goals that I look forward to telling my great-great-great nieces about when it happens—I think the median is preferable to that central tendency midpoint. Of course, we're going to have to be clear that the median is not a consensus, but I think that's easily done. And I think that would be a beneficial addition to the SEP.

Of course, regarding the top part of figure 2, as Todd said, when we lift off, it's irrelevant at that point, it's obsolete, and it should go. But the dot plot, I think, has been proven to be a useful communications device. Stepping back from it would be considered a step back in transparency, which I don't think would be helpful for the Committee. And I think it can prove to be useful in the future as well, depending on how the economy evolves.

Finally, as Todd said, it's important that we give a better sense of the degree of uncertainty surrounding the projections. We have table 2, but a picture can often be worth 1,000 words. I think it could be an important enhancement to our communications. We all know that the divergence of views across participants is not the same thing as uncertainty, but we've seen discussions of this in the press and in the public in which that often is the way the public interprets the divergence of views. And so if we can think about a better way of doing that in terms of conveying uncertainty, I think it would be worthwhile.

As Todd indicated, the subcommittee is continuing to work through some technical issues involving fan charts to indicate confidence bands. It's important to know that other central banks have successfully used fan charts as a way of communicating uncertainty. So I and, I believe, the rest of the subcommittee hope that we can actually use them to enhance our own communications as well. The subcommittee intends to bring a concrete proposal to the Committee later this year. So I just want to say that I think these are important changes that pose little risk and can enhance communications. Thank you.

CHAIR YELLEN. Are there questions or comments? President Kocherlakota.

MR. KOCHERLAKOTA. Yes. Thank you, Madam Chair. I agree with what President Mester just said. I want to thank her, the rest of the subcommittee, and the staff for bringing forward what will prove, I think, to be enhancements to the SEP that pose little in the way of announcement risk, which is a difficult needle to thread. But I think it has been done successfully here.

I have a couple of minor comments. One is about how we will characterize the medians in the minutes and other SEP documentation. The memo clearly recognizes that the new medians don't represent a consensus view, but the language "collective view" is, I think, potentially risky. I would prefer not to use the phrase "collective view." To my ear, at least, the word "collective" suggests the Committee has worked together to reach this assessment of the evolution of economic conditions, but, in fact, it's just a summary statistic of distinct perspectives. I think "the midpoint of the range of views," "midpoint," or even potentially the word "median" could be used instead.

In terms of fan charts, I have mixed views. I agree completely that the SEP's range of projections is too often used inappropriately as an indicator of forecast risk, and so I think the idea of trying to use fan charts to mitigate that confusion is good. I do think the fan charts that we propose are a sort of awkward hybrid of Committee views and external statistics. For example, I will note one thing that we are all asked when we submit our SEP responses: Do you think that the range of uncertainty today is more or less than in the past 20 years? If many of us said "more" to that, then the fan chart itself is not reflective of that. I don't have a strong view about this, and I understand the gains that could be made here. I will just say a couple of things. One is that it may seem modest, but we want to be very careful taking any step like this, because it would be hard, I think, to remove anything from the SEP. And if fan charts are ultimately added, I think it has to be very clearly explained that these are just merely summaries of past data and not the perspectives of the Committee at all. But I do applaud the subcommittee for coming up with these enhancements and, particularly in terms of the suggestions made for September, I am completely supportive.

CHAIR YELLEN. President Lockhart.

MR. LOCKHART. My thanks also to the subcommittee and the staff for moving forward on the SEP. I've thought for a long time that we could make some improvement. I do support publishing medians as well as the other proposed changes to table 1 and figure 2. I support making these changes with the next SEP submission and including notice of these changes in the minutes of this meeting. I also support removing the top panel of figure 2.

On the second question about the inclusion of fan charts, I'm more skeptical. I'm not sure adding the proposed uncertainty bands would materially enhance the communications value of the SEP. I'm not sure there is widespread misunderstanding today that the SEP numbers are subject to a lot of uncertainty. I will wait to see the later construction of the fan charts, but my guess is that they may show very wide potential variance from the median of the projections. I think, best case, this would provide information SEP readers already grasp, and, worst case, it would come across as hedging projections so much as to greatly dilute their seriousness. In earlier years, I sometimes used the expression "I am not entirely sure." My late wife had a knack for cutting to the quick. When I said, "I am not entirely sure," she would respond, "You mean you don't know." [Laughter] The fan chart idea brought back that memory.

As an alternative, if I were a market participant or an outside consumer of the SEP, what I would find useful is information on FOMC participants' forward-looking, subjective assessments of uncertainty. We've discussed this before, and I still think it's worth an internal experiment. We collectively have experience in generating simple subjective probability distributions from survey data. The Desk's primary dealer survey, the Federal Reserve Bank of New York's survey of household inflation expectations, and my own Bank's business inflation expectations survey come to mind. I can support further work on adding some kind of uncertainty overlay on the SEP projections, but I'd like to see that work include an option to generate, as I said, forward-looking, necessarily subjective uncertainty measures concerning the specific forecasts in the SEP. I think something like this would be useful to market participants and the public. Thank you, Madam Chair.

VICE CHAIRMAN DUDLEY. Can I ask a clarifying question? Do you mean something like a histogram? So each respondent would write down their histogram of the probability of outcomes?

MR. LOCKHART. Something along those lines.

VICE CHAIRMAN DUDLEY. Okay.

CHAIR YELLEN. Governor Brainard.

MS. BRAINARD. Sorry—because I have not participated in this discussion before, is the fan chart supposed to be around the median or around each individual projection?

MR. FISCHER. Around the median.

MS. BRAINARD. I don't really understand the mathematical properties of transposing some kind of uncertainty from other forecasts onto a median that itself comes independent of the broader set of macroeconomic projections. I would just want to see more on the mathematical properties of that before we considered it.

CHAIR YELLEN. Governor Fischer.

MR. FISCHER. This says that on the basis of the many forecasts that have been made in the past by various experts, this is roughly the size of the error bands going ahead that we have experienced in the past. This is a typical range of uncertainty that you see from economists. And that's all it says.

MS. BRAINARD. But it's around a median as opposed to a projection?

MR. FISCHER. It's around a median. You could put it around each person if you want, assuming they are all typical people.

MS. BRAINARD. That would make more sense.

MR. WILLIAMS. Well, the Blue Chip is a consensus forecast. The SPF has a median forecast that they publish. And often the calculation we are doing is looking at the forecast errors of the median SPF. So if you think about it that way, we treat the median SPF as a forecast, even though it is no individual's forecast. We calculate the error bands around that and talk about forecast accuracy that way. I mean, that's how we talk about it.

MS. BRAINARD. These are individual point estimates of that forecast, right? They're unconnected to each other, right?

MR. WILLIAMS. Right.

MS. BRAINARD. So I think it's different.

CHAIR YELLEN. President Evans.

MR. EVANS. I think that having some measure like this could well be an advance. I think there are probably opportunities to make adjustments to how we calculate this over time. I don't think this rises to the level that it would be a really big deal if, a few quarters ahead or years ahead, we altered how we did these calculations and explained it very carefully. I doubt that the size of the bands would vary a lot. But at any rate, I just wanted to indicate that I could easily support this type of fan chart.

CHAIR YELLEN. Governor Fischer.

MR. FISCHER. I will just wait until the end.

VICE CHAIRMAN DUDLEY. The one issue I've always had on these fan charts is whether the fan charts are just based on an unbiased average history or are conditioned on where you are in the business cycle. And I think that is a more substantive choice, because I personally believe that you really want to condition it on all of the available information you have at the time. But that's a much bigger exercise in terms of calculating these fan charts.

MR. CLARK. At the subcommittee level, that has come up as something that the staff should look into. For example, you might think of the unemployment rate: If you are already at 5 percent, do you really think it can go to 3 percent? You might want to have that kind of conditionality or asymmetry. So that would be on the to-do list at the staff level.

VICE CHAIRMAN DUDLEY. I would favor a fan chart on that basis much more than one that is unconditional with regard to where you are in the business cycle, because in the latter case I think you get answers that are not very sensible at times.

CHAIR YELLEN. Governor Fischer, did you want to add something?

MR. FISCHER. Yes, just a few things. When we said there are technical problems, there are two sets of technical problems. One has already been hinted at, which is that the SEP already includes a question to FOMC participants on whether you think the risk is up or down. We are trying to figure out if we can get a graphical representation of that, so you can see why that is a technical problem. The second problem relates to the question, how do you draw the fan charts for variables like the unemployment rate, which tend to have a lower bound, which is zero. And typically these things all go out like that, and they take you out into the zero range. So we've got to figure out a way of dealing with that as well. Those are technical issues which no doubt have a solution.

And this was President Lockhart's point regarding our uncertainty about the projections. I certainly agree with the things President Evans said. We are already trying to figure out how to deal with the problems that we see with using the fan charts. But if I can just drop a personal hint about how I began to believe the width of these fan charts: I used to tell Mervyn King regularly, up to 2007, that his fan charts were much too wide. And then came the great financial crisis. They were much too narrow, it turned out. So that is how I got to think that maybe there is something to this widening out that you see.

CHAIR YELLEN. President Lacker.

MR. LACKER. Just a suggestion on the first problem you mentioned, and I think others have mentioned this. We do respond about what uncertainty is, and how large uncertainty is now relative to some historical benchmark. The natural way to communicate would be to supply error bands or fan charts based on that. And then you've got, in the back of the SEP, how the Committee thinks about it relative to that.

CHAIR YELLEN. Thanks. Any further comments? [No response] Okay. In terms of the Committee's suggestion that we make the enhancement that involves including the median and the revised table in September, I have heard several people comment in support. I have heard no one express opposition, but I would like to get a clearer read on sentiment in the Committee. We normally do not decide things like changing the SEP by a vote, but what I would like to do is take a straw poll of all of the participants. The minutes can then express the degree of support. So let me ask all of the participants to raise your hand if you support the changes that are proposed for September. [Show of hands] Okay. Are there any opposed? Okay. Thank you. We will put these changes into effect in September. The minutes will explain what's going to happen in September and what the Committee has agreed on so it will not come as a surprise in the press conference. And we look forward to the subcommittee coming back with more on fan charts. Ellen.

MS. MEADE. There was also the change to figure 2.

CHAIR YELLEN. Oh, yes, and I take it there is also agreement that, whenever we lift off, we get rid of the top part of figure 2.

MR. TARULLO. Only for the most obstinate amongst us.

CHAIR YELLEN. "We increased it, but it was a mistake."

MR. KOCHERLAKOTA. Well, I'll be gone. [Laughter]

CHAIR YELLEN. Okay. We are now going to turn to the economic and financial situation, and let me call on David Wilcox to start us off on our briefings.

MR. WILCOX.[5] Thank you, Madam Chair. I'll be referring to the packet titled "The U.S. Outlook." Our view of the macroeconomic situation has not changed very much since the time of the June meeting. As shown in panel 1 of your first exhibit, we continue to think that real GDP growth stepped up in the second quarter, partly reflecting some unwinding of its very weak first-quarter performance. Even with the rebound, we estimate that GDP growth over the first half of the year averaged only a subpar 1 percent at an annual rate. During the second half of the year, and as in the June projection, we see GDP growth running in the neighborhood of 2 percent. By the end of the medium term, the level of real GDP in our projection is slightly lower than in the June Tealbook, reflecting a stronger exchange value of the dollar and slower expected growth of state and local spending.

The incoming labor market data have also been broadly in line with our June forecast. Although the June unemployment rate—figuring into the second-quarter average shown in panel 2—was one-tenth lower than we had anticipated, the labor force participation rate also surprised us to the downside, leaving the employment-to-population ratio close to our previous projection. Likewise, recent gains in private payrolls have come in about as expected.

As we noted in the Tealbook, the combination of the June decline in the unemployment rate and the slightly weaker outlook for real GDP, all else being equal, would have left us showing no further reduction in the unemployment rate between last month and the end of 2017—an outcome that, in our view, would not have balanced the risks associated with our unemployment rate forecast. To better balance the risks, we made some small adjustments to our supply-side assumptions.

In particular, we lowered our estimate of the natural rate of unemployment 0.1 percentage point, to 5.1 percent. We also trimmed our forecast for potential output growth 0.1 percentage point per year, and we did not let that latter adjustment show through into our outlook for aggregate demand. Taken together—and holding everything else equal—these two adjustments generate a forecast for the

[5] The materials used by Mr. Wilcox are appended to this transcript (appendix 5).

unemployment rate that is 0.2 percentage point lower than it otherwise would have been. Half of that amount reflects a tighter economy, and half reflects a better-functioning labor market.

The argument for a lower natural rate is bolstered by the continued aging of the labor force. Although we had recognized a potential role for demographics for some time, until now we have been wary about letting their effect show through too strongly to our post-recession natural rate estimates. Panel 6, which uses the JOLTS data to plot a version of the Beveridge curve, suggests why: Since the previous business cycle peak, this version of the Beveridge curve has shifted out—a development that could be taken as evidence that labor market functioning had been persistently damaged by the Great Recession.

But we have also been influenced by recent analysis by two Board economists—Andrew Figura and David Ratner—that provides some evidence that the outward shift in the Beveridge curve may not have coincided with an increase in the natural rate. In fact, they argue that if the large secular decline in labor's share of income has been due to a reduction in the bargaining power of workers, then the natural rate might actually be similar to levels seen before the crisis despite the outward shift in the Beveridge curve. In other words, the Figura/Ratner analysis casts greater doubt on one of the considerations that had been impeding us from marking down the natural rate.

Regarding the amount of slack that remains to be taken up at present, panel 3 provides updated estimates of three different measures of resource utilization that we follow. The dotted blue line shows the judgmental estimate that is reflected in the Tealbook baseline. The red line gives the production-function variant of the output gap from the EDO model, which is one of our DSGE models. And the black line—labeled FRB/US—plots an estimate of slack that pools the information from a number of production, labor market, and price indicators while explicitly allowing for measurement error. Both the Tealbook and EDO point estimates suggest that resource utilization has nearly returned to its sustainable position, while the FRB/US estimate suggests that it is already there. Meanwhile, the substantial confidence interval around the FRB/US values strongly suggests that precision is not the greatest hallmark of these estimates.

With regard to prices, as you can see from panel 4, we have revised down our near-term forecast for total PCE inflation. Virtually all of this revision reflects a sharper expected decline in consumer energy prices over the second half of this year that, in turn, results from the recent step-down in oil prices. Although the exact timing of the pass-through from oil prices to retail energy prices is uncertain, our best estimate is that we will see some noticeable declines in gasoline prices over the next few months. For core inflation—panel 5—the incoming data have been broadly in line with our expectations. Next year and in 2017, our projections of both total and core inflation rates are little changed from June.

Finally, I asked Jeremy Rudd to prepare an additional exhibit that provides a high-level summary of the information that will be available to you at your September, October, and December meetings. Incidentally, I think of this as taking up a challenge that President Lockhart issued a few meetings ago to try to envision more concretely the information set that would be available to the Committee. Specifically, the data releases that will be available at the September FOMC meeting are in the blue-shaded region, the incremental releases that will have become available by the time of the October meeting are in the yellow-shaded region, and the observations that will be available for your December meeting are shown in red. In addition, we've indicated the readings that would be consistent with our baseline forecast.

As you can see, for the September meeting, you will have PCE inflation data through July—though the August CPI will be released on the first day of the meeting—and labor market data through August. October will afford you just one more reading on each of these monthly indicators. And December will give you two more beyond that.

On the real activity front, we expect to see continued solid payroll gains at a pace that, on average, is not too different from the average seen over the first half of this year. One thing I would note, however, is that based on recent historical experience, there is some risk that the initial August reading on payroll employment growth will be softer than we've penciled in as our expectation for the underlying reality and will then be revised up in subsequent months. Last year, for example, job gains in August were initially estimated at 142,000, a figure that was revised up to 203,000 in the subsequent two releases. More generally, over the past five years, the initial estimate for August has been revised up 75,000 on average.

On the inflation side, we expect the data readings you will have in hand to stay low even through the time of the December meeting. In the baseline forecast, we now have the three-month change in total PCE prices stepping down noticeably after the September meeting, reflecting the projected energy price declines I mentioned earlier. Core inflation is expected to run slightly below 1½ percent, with the three-month changes expected to be held down some by residual seasonality, which looks to us to weigh most heavily on core inflation in the latter part of this year.

Having shown you these values that would be consistent with our baseline forecast, I hasten to note that however murky you may perceive the message of this exhibit to be, the message of the actual incoming data could be a good deal murkier. The reason is because those incoming data will contain all the features that real-world data have, including measurement error, seasonal adjustment problems, mutual inconsistency, normal random variation, and even substantive departures from our current baseline forecast. Steve will now continue our presentation.

MR. KAMIN.[6] Thank you, David. I will be referring to the materials titled "The International Outlook." To continue the reference to annoyances, one of the

[6] The materials used by Mr. Kamin are appended to this transcript (appendix 6).

annoyances of summer driving—say, to the beach or mountains on a holiday weekend—is traffic jams. It's especially annoying when, for no apparent reason, traffic grinds to a halt, trudges over the next mile and a half at a glacial pace, and then, with no car crash or other distraction in sight, mysteriously speeds back up again. We've had much the same feeling watching developments in Greece. At the time of your most recent meeting, negotiations between Greece and its creditors had been moving forward, albeit quite contentiously. Then talks broke down, the banks were closed, a payment to the IMF was missed, and Greek voters resoundingly rejected the creditors' proposals. But then, after marathon all-night negotiations, Greece's Prime Minister Tsipras agreed to even stricter austerity measures than voters had rejected the week before. And as suddenly as they stopped, talks on the adjustment and financing program started up again.

Details of the program are still being hammered out, but it looks to provide up to €85 billion in loans over three years, conditional on the government implementing a broad array of fiscal and structural reforms. Most of the money won't stay in Greece. Although on the order of €25 billion will be used to recapitalize the badly damaged banking system, nearly €55 billion goes out the door to service earlier loans from the IMF and European creditors. Even with this assistance, Greece will likely be required to run primary budget surpluses—that is, budget balances excluding interest payments—of 1½ percent of GDP in the next two years, rising to 3½ percent in 2018. This burden will be very difficult to bear, considering that Greek GDP—panel 1—will almost certainly plummet this quarter, and that the current government is far from committed to the austerity measures it has promised. Accordingly, Greece will almost certainly run into problems fulfilling the program's conditions over the next few years, leading to further difficulties with its creditors and potentially even to the outcome that Greece just narrowly avoided: its exit from the euro area.

While the developments of the past month have further worsened Greece's outlook, they've had little effect on prospects for the euro area more generally. As Simon has described, financial markets outside Greece were little affected. And indicators of euro-area economic activity have generally pointed to continued recovery. As shown in panel 2, we've marked down economic growth ¼ percentage point in the third quarter, but that solely reflects the arithmetic effects of Greece's deep contraction on euro-area GDP. Beyond the near term, we've actually boosted the forecast a touch to reflect lower oil prices and the weaker euro exchange rate. But there remains a question of whether Greece's debacle may have weakened confidence in the resilience of the monetary union and rendered it more vulnerable to subsequent disturbances. The answer is not obvious. On the one hand, it is reassuring that spillovers from the Greek turmoil were so muted. On the other hand, the disorganization and disunity evidenced by European authorities, as well as their resistance to directly address the sustainability of Greece's debt, may bode poorly for the region's response to future crises. Furthermore, the recent deterioration in Greece's economic and financial situation has likely diminished its chances for normalizing its situation within the euro area.

In addition to Greece, of course, the correction of the Chinese stock market—panel 3—has attracted considerable attention in recent weeks. But here, too, the sound and fury signified relatively little for our forecast. To begin with, the fall in equity prices didn't reveal any fundamental underlying weaknesses that we did not already appreciate. The downturn after the prior surge in stocks looks like a classic example of a bursting bubble. Additionally, because of the relatively small weight of the Chinese stock market in household wealth, corporate financing, and overall financial assets, we do not believe the correction will weigh heavily on China's future economic growth prospects. It also bears noting that Chinese stock prices remain well above last year's levels, though this may, in part, reflect government actions to support the market.

To be sure, China's financial system is exposed to a number of significant vulnerabilities, including weakened property markets, extremely high debt levels, and a shadow banking sector that remains opaque and poorly regulated. Accordingly, it is possible that the stock market crash could trigger a chain reaction of margin calls, fire sales, and defaults that leads to broader financial and economic disruptions. But that does not strike us as the most likely scenario. In our baseline forecast, Chinese GDP growth, having bounced up to nearly 8 percent in the second quarter, moderates over the remainder of the forecast period, in line with declining potential output growth.

Although the recent developments in neither Greece nor China made a strong imprint on the outlook, the tone of foreign economic activity appears a little weaker than we had previously assessed. As shown in panel 4, economic growth in both the emerging market economies and advanced foreign economies had fallen sharply in the first quarter, but at the time of the June Tealbook—the dashed lines—we had assumed growth would rebound in the second quarter. In the event, recent data on trade, production, and PMIs have been considerably weaker than we'd anticipated, and we have lowered our near-term projections of real GDP growth accordingly. We still judge most of these downdrafts to be temporary. In particular, output in Canada, which occupies a large trade weight in our foreign aggregate, was partly depressed by wildfires and maintenance shutdowns in the energy sector. And already, June PMIs have moved up. Therefore, we have foreign economic growth rebounding in the coming quarters, and our medium-term outlook is little changed. However, indicators of economic activity and trade came in softer than we expected for many countries besides Canada, and we remain attuned to the risk that the first-half pothole may turn into a more extended slowdown.

The continued weak tone of foreign activity likely contributed to a number of developments affecting the U.S. economy, as Simon has described. First, as shown in panel 5, oil prices fell $11 per barrel over the intermeeting period, though the decline also reflected still-high levels of oil production and expectations for a step-up in Iranian oil exports following the completion of the nuclear deal. Second, as shown in panel 6, the dollar rose further, likely reflecting continued focus on the divergence between monetary policy prospects in the United States and abroad.

The rise in the dollar since last summer has been an important factor weighing on the outlook for U.S. net exports and, thus, on economic activity. Accordingly, I thought I'd spend a few minutes explaining how we devise our trade forecast and why we are predicting so much drag from the dollar. As indicated in your next exhibit, at the heart of our forecast is a model composed of a number of equations for the main categories of exports and imports of goods and services. These equations explain the evolution of these trade volumes based on movements in their fundamental drivers: foreign and U.S. GDP and real exchange rates. They are econometrically estimated using more than 35 years of quarterly data, and they are simulated using staff forecasts for the explanatory variables. These model projections are then augmented by historical trends and judgmental forecasts for several additional trade categories.

The bottom line is that, based on our trade model, we assess that a 10 percent rise in the broad real dollar should lead to a deterioration in the contribution of net exports to U.S. GDP of 1.7 percent. Importantly, our econometric estimates identify significant lags in the transmission of the dollar to U.S. trade, so this 1.7 percent drag takes place over a period of three years.

The middle panel of your exhibit compares the actual evolution of the net export contribution to U.S. GDP growth (the solid black line) with our model projection, decomposed into the part coming from the dollar (the blue bars), U.S. and foreign GDP (the green bars), and our separate forecast for the volume of oil imports (the purple bars). Looking at the far right of this chart, notice that our forecast of the net export drag coming from the dollar in 2015 and through 2017 totals about 2 percentage points. This drag essentially reflects the 1.7 percent elasticity coming from our trade model that I mentioned earlier, combined with a rise in the broad real dollar since last summer amounting to 12 percent, as shown in the bottom panel.

Turning to the historical portion of the chart, our model does a reasonably good job of tracking previous periods of large dollar appreciation and net exports deterioration as well as periods of dollar depreciation and trade improvement. The erratic swings in net exports since the global financial crisis have been difficult to track, but we see no evidence that the basic behavior of net exports has shifted significantly from earlier years. Nellie Liang will now continue our presentation.

MS. LIANG.[7] Thank you. My briefing summarizes the staff's current assessment of U.S. financial stability. I'll be referring to charts in the handout titled "Financial Stability Developments." The picture is largely unchanged from last quarter, though we have nudged up the level of vulnerabilities stemming from asset valuation pressures and business sector leverage. These vulnerabilities, however, continue to be counterbalanced by relatively high levels of capital and moderate levels of maturity transformation in the financial system. On net, we judge the vulnerability of the financial system as a whole to be in the moderate range, a level

[7] The materials used by Ms. Liang are appended to this transcript (appendix 7).

determined relative to metrics covering roughly the past 30 years. The remainder of my briefing provides some detail on this overall assessment.

As shown in the top-left panel, capital and liquidity positions of bank holding companies are substantially higher than in the period preceding the crisis, increasing the stability of the core of the financial system. Common equity tier 1 capital, the red line, has been about unchanged over the past year even as implementation of Basel III has led to a rise in risk-weighted assets. In addition, firms have built up their ratio of high-quality liquid assets, the black line, and now most meet their new, fully phased-in liquidity requirements.

In the nonbank sector, signs related to leverage are mixed. Dealers' net borrowing for fixed-income securities, the blue line in the right panel, has continued to decline to a very low level, and capital ratios, not shown, have been rising. On the other hand, margin debt for equities as a share of GDP is at a record level, and responses to the SCOOS, the Senior Credit Officer Opinion Survey, and conversations with market participants indicate wider use of "synthetic prime brokerage" arrangements by hedge funds, suggesting some pickup in off-balance-sheet leverage. On net, though, we judge that vulnerabilities from the overall financial-sector leverage to be at a below-average level.

As Simon discussed earlier, the imprint of recent financial stresses related to Greece and China on the U.S. financial system has been limited. As shown in the middle-left panel, five-year CDS spreads of large U.S. financial institutions were mostly unchanged. The muted response to the financial turmoil in Greece is in sharp contrast to the situation in late 2011, when Greek debt problems had escalated, likely reflecting currently lower direct exposures and, potentially, a smaller shock from Greece related to beliefs that European authorities will take actions to stem contagion. The current reactions also likely reflect the considerably stronger financial positions of firms that are connected directly or indirectly to one another.

A major vulnerability in the previous crisis was the scale of short-term wholesale funding used to finance longer-term risky assets. An aggregate measure of runnable money-like liabilities, shown in the middle-right panel, has fallen significantly from its peak in 2008 as amounts outstanding for most instruments, such as repo and MMFs, have shrunk. In addition, there has been important progress to address key structural problems, such as the SEC's rulemaking to remove the NAV rounding from institutional prime MMFs, and the near-elimination of intraday credit in the triparty repo market. That said, the full effects of the MMF reforms are still to be seen.

Recently, many market participants have expressed concerns about reduced bond market liquidity—that is, they are not able to transact in reasonable quantities when they want to at reasonably low and predictable costs. A recent staff assessment of transactions in corporate bonds and Treasury securities does not support a significant deterioration in market functioning, but the picture for the resilience of liquidity is somewhat mixed. Two representative indicators are shown in the bottom-left panel. As shown by the black line, bid-asked spreads for corporate high-yield bonds have been trending down and are relatively low. At the same time, the share of trades that are greater than $1 million, the red line, has declined, indicating average transaction sizes are now smaller.

In the Treasury market, the recently issued interagency study on the October 15 event detailed a sharp decline in market depth in the narrow event window but did not identify a specific cause for the volatility. In addition, it showed that trading volumes were very high, pricing was continuous, and cash and futures markets stayed aligned. It also highlighted that firms employing proprietary high-frequency trading strategies accounted for more than one-half the transactions, and traditional broker-dealers accounted for about one-third of transactions on typical days in 2014, indicating important structural changes in the provision of liquidity.

One often expressed reason for heightened concerns about market liquidity is the increase in mutual fund holdings of corporate debt, including relatively illiquid loans and bonds, shown in the lower-right panel. The concern is that the offer of daily cash redemptions by open-end mutual funds provides a first-mover advantage for investors to exit ahead of others, who would be left to bear the costs of asset sales. Thus, a fall in bond prices could lead to greater-than-expected redemptions and to an increase in price volatility. The staff are working (along with the FSOC and FSB) on these possible effects, but they currently believe they would likely not have significant spillovers in the absence of leverage by bond investors.

The next exhibit starts with asset valuations, an area where we have seen some pressure in some sectors based on indicators being notably above their averages of recent decades. Asset valuations are tracked because compressed risk premiums could suggest a higher risk of a sharp drop in prices and a potential systemic risk if interacted with other vulnerabilities, such as high leverage and maturity transformation. They also are an indicator of investor risk appetite because much risk-taking behavior is not easily observable or quantifiable.

As shown in the top-left panel, corporate bond yields remain near historical lows, reflecting, in part, low term premiums on Treasury securities. Spreads also are narrow, though they rose a bit last year as risks for energy firms increased when oil prices fell. Low rates have supported strong issuance of high-yield corporate bonds and leveraged loans, as shown in the lower-right panel, and outstanding debt had been risen rapidly. In addition, as we have noted in the past, underwriting standards such as debt-to-earnings multiples have been relatively loose, though public data indicate the credit quality of loans has improved this year.

In commercial real estate, prices have been rising rapidly in the past three years, and the capitalization rate—the rent-to-price ratio, shown by the black line in the middle-left chart—has been falling to a level last seen in 2007. In addition, CMBS issuance, the bars in the panel, have been picking up. Combined with CRE loans at banks, the ratio of total CRE debt to GDP is above average but has not yet accelerated. Competition among lenders reportedly is leading to a weakening of standards, and loan-to-value ratios and the share of interest-only loans in CMBS pools appear to be rising. At commercial banks, lending standards have been easing, on balance, for the past few years, and supervisors have started to increase their monitoring of this sector.

In the equity markets, forward price-earnings ratios for the S&P 500 and for small cap stocks, shown in the middle-right panel, have edged off their recent highs but are above their historical averages. The equity risk premium, not shown, has continued to decline but is not unusually narrow, largely reflecting the low interest rates.

Turning to the nonfinancial sector, as shown in the bottom-left panel, real credit growth to households and businesses has been picking up, but this masks distinct trends in the business and household sectors. With the business sector having emerged from the crisis in solid shape, credit has been available on favorable terms for many years, and debt has grown rapidly for the riskier part of the corporate sector. As shown in the bottom-right panel, the debt-to-asset ratio for speculative-grade corporations, the red line, has increased to near-record levels. This ratio is also rising for all nonfinancial corporations, shown by the black line, though debt service burdens are low, held down by low rates and high earnings. In contrast, many households have been continuing to work down their debt, and loan balances are rising only modestly. Household debt-to-income ratios, measured at the county level, have moved down significantly in recent years and have yet to turn around.

In summary, the largest financial firms are now more resilient, and credit for businesses and households is supported by more stable and less complex funding than before the crisis. These developments are central to our overall assessment that the financial system is only moderately prone to amplify shocks. That said, rising debt burdens for riskier businesses, elevated valuations, and loosening lending standards for many assets point to some building pressures and may warrant additional attention if current trends were to persist. In addition, bearers of liquidity risk in the corporate bond market appear to have shifted from highly leveraged firms, the banks and broker-dealers, to much less leveraged entities, such as private funds. This shift, in principle, could be stability enhancing, on balance, but raises questions about the resilience of liquidity and possible spillover effects. For markets more broadly, including both corporate and Treasury securities markets, the staff currently are studying potential changes in the incentives for the provision of liquidity, including changes in technology, disclosure practices, and dealers' business models because of regulations or changes they may have made on their own to their risk-management practices. That concludes our prepared remarks, and we'd be happy to take your questions. Thank you.

CHAIR YELLEN. Questions for David, Steve, or Nellie? President Mester.

MS. MESTER. Nellie, I have two questions for you. First, I want to say that I can actually see changes over time in the QS reports, and I find them very useful, so I appreciate the staff work on that. One question I have concerns the fact that market participants are telling us that there are liquidity problems in the fixed-income market, and yet our measures really don't seem to be picking that up. I know we can't rely too much on anecdotes, but I'm wondering whether they are informing us about our measures being off. How should we think about that? How does the staff think about that?

And the other thing I noticed in the report is that it talks about how, after the leveraged loan guidance was put out, there doesn't seem to have been a switch from banks doing it into the nonbank sector. I'm wondering whether that's telling us something about the guidance, that perhaps banks aren't paying attention to the guidance. And this is important because Presidents Rosengren and Kocherlakota talked a little bit about the tabletop exercise that we had done on financial stability, and guidance was one of the tools that we said would be a potentially useful tool. But if it's not working, or we don't think it's going to be working, then we may have to rethink the efficacy of that tool. I'd just like the opinion of the staff on that.

MS. LIANG. Let me speak with regard to market liquidity first. The measures we have, and the ones we have tracked over time, are about transactions that have actually occurred. So what you don't observe is a transaction that someone might have wanted to take had they been able to execute at a price they wanted, for example. We are trying to build data that might give you a better look. For instance, regarding market depth, if you actually have order books and you could see for a typical transaction size how far into the order books you had to go to transact, that might give you better sense of how much there is.

We were able to actually see a lot in the October 15 report, which was able to get a lot of detail on the order books at, I think, millisecond units of time. I don't think we have to go to milliseconds to observe what's happening in, say, corporate bond markets, but there are more and better data that we're pursuing. I think there are important issues related to why provisional liquidity would have changed, and maybe just understanding the motivations better might be able to help us as well. We hear it everywhere. The data aren't that supportive, but we're open to the discussions.

On the leveraged loan guidance, we've been tracking that very carefully for migration. One of the big concerns about guidance was that if you just told the banks they couldn't do this, the activity would migrate. What we did was break down the market a little bit into big loans—say, over $100 million—and then what we call the middle market. And for the large loans, there's less migration. And it could just be that banks need to have size to be able to provide the revolvers associated with $100 million loans. We've seen market shares of nonbank firms move from around 7 percent to 10 percent, back to 8 percent—they jump around—and the next tier of investment banks haven't really gained substantial share.

In the middle market, it's very possible they're gaining more share. That's very hard to track. Business development companies and private equity funds can do some direct lending, but they tend to be much smaller loans. The business development companies are also much less levered than the banks who might provide the loans. I think from a financial stability perspective, it might be better. It is hard to tell. In our view, there continues to be a lot of issuance. Capital is available. The underwriting standards are getting better. I think, at least while we're in the midst of it, it's hard to know whether it's been successful, but it seems like it's gone in the right direction.

MS. MESTER. So what I'm hearing you say is, it's effective on the banking side, and it doesn't have the unintended consequences of shifting things.

MS. LIANG. Not yet. Over long periods, say two or three years, it's possible that the industry could transform and change their practices, and they could pick up the activities of the larger banks. But it's not immediate.

CHAIR YELLEN. President Williams.

MR. WILLIAMS. Thank you, Madam Chair. I would like to echo President Mester's comment. I find that these QS reports are very valuable. We discuss them quite a bit at the Federal Reserve Bank of San Francisco, and I've seen significant improvement in these over time. The staff should get a lot of credit for that.

In our bank's discussions last week, I was struck by the radar chart. It's in the back of your QS memo. It's one of the cooler charts coming out of the Board these days. But besides talking about how it's cool and knowing that it's called a radar chart, I wanted to actually ask you for your perspective on this. In the text of the QS report, in your judgmental assessment of various parts of this, you actually comment that it might be somewhat different from the quantitative part, but I just want to focus on the quantitative part for this purpose. The radar chart basically breaks out financial stability risk for the financial sector, the nonfinancial sector, and risk appetite/asset valuations. What's really striking about your assessment, both this time and for some time before this, is that the heightened risk assessments are all with regard to this asset valuation/risk appetite, and there's essentially none on the quantitative side regarding the financial-sector vulnerability. And, again, in the qualitative discussion in the text, you go into that in a little bit. But the question I have for you is—if you were to roll back time and think about 2006 when, in this radar chart, you show everything is dangerous, we should have known that things were about to explode. To what extent are there hidden aspects of vulnerabilities in the financial system that our quantitative measures somehow don't see or don't capture and that, years later, when the thing blows up on you, you say, "Oh, yes, sure. There were a lot of short-term wholesale funding problems. There was a lot of interconnectedness." I don't even think the word "interconnectedness" was in our vocabulary in 2006. So I'm asking a serious question about the real-time use of this versus the ex post description of things. How much confidence do you have that our financial sector has essentially no vulnerability on its own today? That last one was an easy one.

MS. LIANG. As you know, the radar chart uses time-series data—what you can capture in quantitative data and what you ex post now go back and look at. If we were to use just this, we might assign a level of vulnerability to the financial system a notch lower than we are—which is, say, moderate, which is in the middle of the range—because, as you say, everything here except for asset values is as low as it's been.

There are a couple of reasons we don't. There are things that I don't think you can capture in time-series data, so we apply judgment. One is bank leveraging, for example. I think with hindsight we know that capital was too low before. Right now we're double that, but is that enough? We don't really know, so we're withholding judgment on it. There are also structural issues that don't get captured in time-series data. For example, a money market fund vulnerability to runs is very difficult to capture here. Perhaps we've addressed that one. But liquidity transformation is a different risk that we're hearing about and evaluating and that you can't capture here. And the one that I probably worry most about is the off-balance-sheet leverage, which is really hard to see. Derivatives markets have changed a lot since the 1980s, and we just haven't been able to capture that in this yet. Those are a couple of the reasons why we wouldn't just take this and say this is our assessment. But it's useful because it does force you to think about, well, where are you relative to, say, the 1980s? If you didn't see structural problems or missing data problems, you might just be able to use this.

MR. WILLIAMS. If I may follow up: I've lived through the 2000s. We all have. We lived through these various bubbles, and if you were to do a real-time, Orphanides-esque exercise about these quantitative measures—and I know you didn't construct these in 2006—but if you went back and looked at the memos and the analysis that was done, I'm guessing that a lot of these things weren't even on the chart. And so I worry that there are things that aren't on the chart today that are really the biggest dangers. When I look at something that says it's all clear, I feel like it's because we're not looking, somehow, at the things that just aren't on the radar, if you will. And with that quip, I'm going to end.

MR. TARULLO. But a lot of what Nellie and her office do though, I think—Nellie, correct me if I'm wrong—is to go in and look at where leverage, funding vulnerability, or both are rising, particularly rising at rates that are much larger than historical averages. And then they dig into those. What you see is the end result of all their analysis. So I think, President Williams, part of what you're getting in that radar chart is the gross conclusion based on a lot of more discrete inquiries they're doing along the way that all factor into those gross answers. Now, there's no guarantee that they or we or anybody else are picking up on every one of those hidden vulnerabilities you see, but I think there's some sort of filtering concepts that they, and the people at OFR, and a lot of others who are trying to make it their business to identify financial stability problems in advance are now using to begin the analytics that they engaged in. Is that fair?

MS. LIANG. Well said. Thank you.

MR. TARULLO. Yes—whenever you defend the staff, they say that was very good. [Laughter]

MR. POTTER. The situation in 2005 to 2007 wasn't that hard to see. You had to try very hard not to see it.

MR. TARULLO. It was seen. It's just that people didn't do anything about it.

CHAIR YELLEN. President Lockhart.

MR. LOCKHART. Thank you, Madam Chair. A question for Steve Kamin, to interpret your explanation of the exchange rate sensitivity of net exports and their effect on real GDP growth a little bit in a grander way. When the dollar began to appreciate a little more than a year ago, a back-of-the-envelope guesstimate that I would have made was that a significant amount of our trade is cross-border with Mexico and Canada, a back-and-forth, supply chain sort of trade, which is not necessarily sensitive to an exchange rate. Another big piece of it is agricultural that sells into markets that are dollar denominated. Mining is also conceivably in that category. And then airplane orders are placed well in advance. So I would have guessed then that we didn't have an economy very sensitive to exchange rate movements, or less than some other countries. And yet, in the first quarter, we saw net exports have a pretty significant effect, and your projection, I think, shows a pretty significant effect on economic growth for a 10 percent appreciation. Could you just elaborate a little bit more? When you step back, what have you learned about the U.S. economy from this process?

MR. KAMIN. I think you are entirely right that the more your trade involves these two-way trades, with inputs going back and forth, that, all else being equal, ought to diminish the effect of exchange rates, at least on gross trade flows. It will not necessarily diminish their effect on trade balance, because, again, these things are going back and forth. But all else being equal, you might expect some reduced effect of exchange rates on trade the more of your trade is of the two-way type, and the less of it is non-two-way trade in, for example, finished goods.

Now, a couple things. First, we have been very keen to try to ascertain whether our model estimates, which are basically estimated over a sample that goes back to the 1970s in some cases, in some sense apply less now than they did before. And the short answer is that we are not convinced that they are less applicable, though we are parsing some evidence that goes in different directions. If you take a look at the charts, looking at the years 2010 through 2014, it doesn't look like our model has gone tremendously awry. But at the same time, it doesn't seem to be fitting as well as in previous episodes. Second, it is true that if you estimate our trade models over some more recent samples—say, starting in 2000—then you do get somewhat smaller elasticities. On the other hand, you don't get particularly improved performance, in a robust sense, in tracking changes in the trade balance over this period. And we think that a lot of what is going on is that the global financial crisis so disrupted trade flows—it led to this huge decline in trade, followed by very sharp rebounds, that our model couldn't capture—and that is part of what's at play. So, we are alert to the possibility that the structure of trade has changed over time, but we are not convinced we see enough of that in the data to merit reducing our elasticities of the response of trade to the dollar.

Now, directly to that issue, our model embodies responses of exports and imports to changes in the dollar that are not particularly outsized, and broadly speaking are in the neighborhood of what you will find in the literature. And I would note that, as a rule of thumb, macroeconomists often assume that trade responses, or any type of demand responses to prices, are of a unit elasticity. So if the price goes up 1 percent, the demand goes down 1 percent. And we often make those assumptions in our trade models, too. In fact, our model incorporates features such that when the dollar goes up 10 percent, exports fall by 7½ percent. That implies a responsiveness of trade to the dollar that is actually less than 1. And on the import side, we have even smaller responses to a change in the dollar. So the merits of further compressing those trade responses don't seem great. You raise a question that we are definitely in the process of wrestling with. For now, we think the trade responses that we have built in are about right, but we are certainly going to be looking into this further.

CHAIR YELLEN. Governor Fischer.

MR. FISCHER. Thank you, Madam Chair. This is for David Wilcox. You went through page 1 of 2 very systematically, and I was waiting for the Beveridge curve, but it seemed to fall off the page. Tell us what we see there and where it's going.

MR. WASCHER. I'll take that question. The chart shows that the Beveridge curve for the JOLTS vacancy rate has shifted out. Ordinarily one would think of a shift out in the Beveridge curve as indicative of a decline in matching efficiency, and we had built that in. One of the reasons we hadn't lowered our natural rate was because we were taking some signal from that, offsetting the downward pressure on the natural rate that arises from demographic changes in the labor force. So what David was referring to was that Andrew Figura and David Ratner on our staff have put forward an argument that the outward shift in the Beveridge curve may not be reflective of an increase in the natural rate of unemployment if it instead is due to a decline in worker bargaining power, as perhaps evidenced by the decline in the labor share over the past decade or so. In that case it is more profitable for firms to post a vacancy because the labor share is lower, and they get more of the profits from any additional employee. And that would push up the equilibrium level of vacancies relative to any unemployment rate.

That is roughly the story that David was trying to illustrate with the Beveridge curve. That it has shifted out. Previously, we had interpreted that as consistent with a decline in matching efficiency or an increase in the natural rate. But maybe there is another story that leads us not to take as much signal from that outward shift.

MR. FISCHER. Thank you.

CHAIR YELLEN. Vice Chairman.

VICE CHAIRMAN DUDLEY. I wanted to follow up on the conversation that President Williams started on the radar chart. It seems to me that you are trying to assess financial-sector vulnerability, and your ability to do that, though, is only as good as the metrics that you have on the right-hand side of the column. So I wanted to ask a question on, how do you think about things like legal risk, which has obviously gone up dramatically, or cyber risk, which has gone up dramatically? And when would that rise to the level that you would put that in the radar chart? Because it seems like those are two really big risks that have emerged in the past few years that weren't significant before. And this is not a criticism. I think that what you guys are doing is great. It is state-of-the-art, as far as I am concerned. But how do you think about something like that?

MS. LIANG. Behind this are a number of indicators—around 40. First, cyber risk is not on here. We think of that not as a financial vulnerability. It is more of an operational risk, which isn't on here. Legal risk is on the border of that, but, in principle, you could catch that with bank leverage or the bank capital ratios. Do you incorporate? Are they holding capital sufficient for legal or operational risks? And so on. Things that we currently do in the stress test, we try to capture some of that at this point. And so, to the extent we can put that in here in a quantitative way, we do so. We don't have a time series on that, though, so my guess is, it's not well captured in here, which is also why this is just a backstop, and we don't stop here.

VICE CHAIRMAN DUDLEY. Well, one way to get at this a little bit is, you have some very large banks that are still selling at a discount, their book value. And I find that interesting. In an environment in which the stock market is at a multiple of book value, you have these big financial institutions that are still very depressed. That might be something to think about.

MS. LIANG. Yes.

MR. WILCOX. Can I offer just a brief bit of context on what this radar chart is? And, Nellie, maybe you and I can have a little dialogue back and forth, and we'll get it straight between the two of us. My understanding is that a rough way to see what is going on here is to think of this radar chart as, in ever-so-rough terms, analogous to, say, the FRB/US or the EDO model. It is an algorithmic approach, which I think is used to inform what might be called the analogue to the judgmental staff assessment of financial stability. I think there were many staff members who were very excited about putting this radar chart methodology together, but the exercise was not to supplant all of the judgment of the human beings that are involved in the QS process, but rather to say, "Okay, look, what could we do if we had a little bit of an expert system, or a very algorithmic approach based on quantitative indicators? And let's just gain some real-time experience with how well or poorly that performs." I think it's a little like the status of the FRB/US model with regard to the judgmental economic outlook.

MS. LIANG. Right. The FRB/US model, though, has a lot of structural modeling elements. This, in contrast, is pretty statistical. Just to be clear, "algorithm" covers a broad range of approaches. But that's exactly right.

VICE CHAIRMAN DUDLEY. Thank you.

CHAIR YELLEN. President Kocherlakota.

MR. KOCHERLAKOTA. Thank you, Madam Chair. I wanted to ask, on the financial-stability report, the valuation pressures are described as "notable," but a lot of that seems to be driven—and you can certainly correct me if I am wrong on this—by the fact that term premiums are so low. Risk premiums themselves don't seem that high. And, in fact, you could make an argument that housing looks undervalued in some sense. At least the risk premiums on housing look very high, if you were to try to look at where the price-to-rent ratios are relative to longer-term risk-free yields. My question is, what made you come down on the side of thinking about the valuation pressures being "notable" as opposed to simply noting that term premiums remain remarkably low?

MS. LIANG. When we say "most asset valuation pressures," we exclude residential housing.

MR. KOCHERLAKOTA. Yes. Thank you.

MS. LIANG. I think in the corporate sector—commercial real estate—there are rising prices and rising capitalization rates, et cetera, even relative to low spreads, at least in the high-yield bond sector. In conjunction with that, we see the weakening of underwriting standards. So it is just looking at the prices plus looking at what investors are willing to pay for something. And are they willing to give something up just to get an asset that is yielding them something a little higher? This is based on underwriting standards, quantitative factors that we can assess, conversations with market participants, and the actual metric. So it has some of that. In that sense, we have it. In the CRE space, we are seeing the decline. And we hear a lot of discussions about rising LTVs, shopping for ratings on the CMBS—the kinds of things that make you think people are taking a little bit more risk than they had been for a while.

CHAIR YELLEN. President Rosengren.

MR. ROSENGREN. I have a question for Nellie as well, so obviously your report was one that was well read this time around. And it is a follow-up to what Loretta asked about highly leveraged loans. When we think about financial-stability risk, both amounts and distribution matter. And when you look at the league tables for who is underwriting the highly leveraged loans, there have been some dramatic changes. And, specifically, there is a fairly large broker-dealer who didn't used to be on the league tables who is now much more significant on the league tables for doing highly leveraged lending. It isn't in a bank holding company, and it is supervised by the SEC. So I wonder how we think about how people are moving up and down the league tables for some of those markets that we think are critically important, and whether there is some way to also capture some of that concentration of risk that may be moving out of the regulated sector into the unregulated sector, particularly with a supervisor that may not be as focused on financial stability.

MR. TARULLO. I just want to make sure everybody is clear. Very little of this stuff is held on the balance sheet of regulated institutions. What Nellie's charts are showing is the originations of this stuff—but, Nellie, you have to help me here, because you haven't done a recent detailed briefing on this—most of which is being held by quite nonleveraged institutions. And so I actually don't think, as we have looked at this, that we have seen it as a financial stability risk, as conventionally understood, so much as, instead, a potential macroprudential risk because of what would happen to the real economy if there were an awful lot of bankruptcies, which then carried through into affecting the end investors.

VICE CHAIRMAN DUDLEY. There is a warehousing risk.

MR. TARULLO. There is warehousing, but to date that has not been big issue.

MS. LIANG. Right. I think the supervisory guidance and the lessons from 2008 are still fresh enough that they're managing the pipeline risk. We've been looking at the league tables for loans over $100 million. The largest nonbank entity—which is an SEC-supervised broker-dealer, I think, if we're referring to the same entity—its shares have held constant between around 3 and 4 percent. Is that what you're referring to? I still see the top 10 as being standard bank holding companies.

MR. ROSENGREN. When you talk to private equity and ask them who they are going to get their bids from, that broker-dealer seems to be the broker-dealer of choice.

MS. LIANG. Right. It had a 4 percent share in 2014 and 3 percent in each of the first two quarters. So it clearly is there as an alternative, and it hasn't really moved up the ranks over the past couple of years as much as we had maybe thought it could. Again, these are league tables that give the share to the primary bookrunner. It's possible that others might participate more than they used to. This is just one way to look at it. So, for the large loans, where we are now, the way we've been thinking about it is that the ability to provide some backup revolver limits the ability for nonbanks to be the primary lead. For middle-market loans, where a smaller fund could take it and distribute it, then it's possible these kinds of firms can join.

CHAIR YELLEN. Okay. We now have an opportunity for comments on financial stability—not a full go-round—and I have two people who indicated they would like to make comments. Let me start with President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. I thought it might be useful to give a brief discussion of the financial-stability tabletop exercise conducted by the Financial Stability Committee of the Conference of Presidents in Charlotte in June. The purpose was to obtain a better understanding of how the nexus of monetary policy and supervisory policy tools could be used in a scenario in which financial stability issues were emerging. The exercise was based on the assumption that decisions were being made in 2017. At that time, the scenario that was assumed was that the economy had attained both elements of the dual mandate and the economy was expected to remain at full employment and 2 percent inflation in the absence of any changes to our monetary policy stance. The staff provided forecasts for both macroeconomic variables using Tealbook discussions as well as developments in financial markets. The scenario also included signs of emerging financial instability. Specifically, the scenario included a rapid rise in real estate values, significant growth in the shadow banking sector, and increased risk-taking by non-SIFI financial intermediaries.

The discussion of the scenario and possible policy responses highlighted the important role of both governance issues and time lags in many of the potential supervisory policy responses. In part because of these governance complications and the lags in supervisory implementation, some committee members thought that monetary policy tools should be considered to address the concerns about future financial stability, even though doing so would result in a less optimal macroeconomic outcome. Other members wanted to use supervisory tools and margin requirements but did not necessarily rule out using a monetary policy tool at some later point.

The exercise was useful in crystallizing potential financial-stability problems and the complexity of responding to those problems. I've shared the materials with Governors Fischer and Tarullo and think it might be worthwhile considering such an exercise for the full Committee at some future date. Thank you.

CHAIR YELLEN. Thank you. President Kocherlakota.

MR. KOCHERLAKOTA. Thank you, Madam Chair. Actually, my remarks will build on President Rosengren's. I was one of the members of the committee who did think that monetary policy might be a useful response to the situation that was crafted by the staff. With that in mind, I think that this Committee, the FOMC, should begin to thinking about recording its assessment of financial stability conditions on an ongoing basis in the FOMC statement itself. If we do think there is a chance that, in the future, the FOMC will feel the need to adjust the stance of monetary policy in response to financial-stability risks—and President Rosengren described the very plausible contingency that the New York and Boston Reserve Bank staffs helped frame for the Conference of Presidents' Financial Stability Committee that seemed to have that feature—and if we think we're going to be adjusting the stance of monetary policy in that context, then I think it means that we have to, as a Committee, start to say something about how we're assessing financial-stability contingencies on an ongoing basis.

So what would that look like? I think what it could look like is adding a sentence about financial stability conditions to paragraph 1. One way to at least start that discussion would be to simply restate the QS report's assessment that overall financial system vulnerabilities are moderate. Alternatively, and like the QS report, the new sentence could also mention that there are notable vulnerabilities in valuation pressures. If we were to add such a sentence today or tomorrow in the FOMC statement, you would add a sentence to paragraph 1 that would read, "In the Committee's assessment, financial system vulnerabilities were moderate." You could stop there, or you could add a second clause saying "with notable vulnerabilities associated with valuation pressures in certain asset classes." This is just a one-sentence description of what we would be seeing in the financial system in terms of financial stability risk. I don't think we want to wait until the moment when it turns out that financial system vulnerabilities are really high so we're going to raise rates to start to record that in the FOMC statement. I doubt that the Committee will feel comfortable going forward with this in this meeting, but I certainly encourage building toward that kind of formulation in the statement itself. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you. First, on the tabletop exercise, it was a really good tabletop exercise because it wasn't obvious what the right policy solution was supposed to be, and people had quite a bit of disagreement. So it shows there's a lot of nuance here in terms of figuring out how to use monetary policy versus macroprudential tools. That was really very useful.

I want to talk a little bit about Puerto Rico, which is in our District. The Tealbook had a box on it, which I thought was quite good. I think this is likely to be a very messy process because there is no bankruptcy option currently available for the territory of Puerto Rico or for its public corporations. Puerto Rico officials are seeking, with the support of the Administration, legislation that would provide a Chapter 9 bankruptcy filing option. This could either be narrow, which is what the Administration would support—in other words, it would just apply as a public corporation, such as PREPA, which is the government power company—or broad, which is what the commonwealth would prefer, and that would apply to all of the commonwealth's obligations. But the hurdle to even getting the narrow Chapter 9 legislation is high because many lawmakers are reluctant to set the precedent of providing this option. Recall that U.S. states do not have the right to file for bankruptcy protection, although municipalities in states do have that option.

So if you assume that broad Chapter 9 legislation is not forthcoming, it seems to me that it's going to be very challenging for Puerto Rico authorities to be able to restructure their Puerto

Rican debt on a voluntary basis before the territory hits the wall in terms of running out of financial resources. This means that sometime later this year or early 2016, there really is a risk of a hard landing—you can think of it as our own Greece—with the potential of disruption to social services and even, potentially, social unrest. When this will happen is hard to say. There's really considerable uncertainty about how long the liquidity resources of the government and the Government Development Bank will last. I don't really know when the timing of this might take place.

Now, while a bad outcome in Puerto Rico seems quite likely, I do agree with the Tealbook's assessment that contagion risks seem to be low. Puerto Rico's problems are quite unique and are already well known. Puerto Rican municipal debt, while sizable, only represents about 2 percent of the total tax-exempt market, and the bulk of the Puerto Rico outstanding munis have already been marked down sharply in price. So a good portion of the pain has already been manifested in financial markets. One other potential channel of contagion are the monoline insurers, which guarantee about $15 billion of Puerto Rican debt. Their share prices have often fallen sharply, and they would clearly be hurt further if there was actually an outright default. The good news is that the role of the monoline insurers has diminished very significantly since the financial crisis. Monolines currently wrap only about 5 percent of new municipal bond issuance. So the ability of states and localities to raise funding, even if Puerto Rico got into difficulty and the monoline insurers went out of business, shouldn't be disrupted unduly. But this is something that could be very, very messy and difficult for Puerto Rico. So you want to distinguish between the implications for the country and the implications for Puerto Rico—sort of like Europe.

CHAIR YELLEN. Okay. I suggest we take a 10-minute break. There is coffee available, and we'll come back to start our economic go-round and, I hope, get through it before dinner.

[Coffee break]

CHAIR YELLEN. Why don't we get started on our economic go-round. We're going to begin with President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. Many analysts have noted some improvement in the ECI recently. While the current reading of 2.8 percent is up from last year, it's still relatively low by historical standards. However, some analysts have cited the recent trend in the ECI as evidence that tightness in the labor market is starting to show through to the ECI. Some caution should be used for this interpretation. When you disaggregate the data and consider increases in the minimum wage in many states, it may be premature to place too much emphasis on the recent numbers as indicating tightness in the labor market.

New England, like most of the country, has continued to see improvement in labor markets. Four of the six New England states have unemployment rates below that of the national average. That's why it's surprising that qualitative discussions of labor markets from advisory groups and regional contacts describe wage and compensation pressures as being primarily isolated to difficult-to-fill positions, such as cybersecurity professionals. Even with a low unemployment rate in most New England states, employers aren't complaining of wage pressures other than those due to legislated salary changes and those in hard-to-fill jobs. In light of the qualitative responses from businesses in our region, it's been quite puzzling that the employment cost index has recently registered such outsized increases in New England.

Nationally, until a year ago, the ECI had been rising at a very modest rate, roughly at 2 percent a year. Over the past three reports, the year-over-year ECI has been trending up and is currently at 2.8 percent nationally, which might be interpreted as showing the first signs in the data of emerging labor market tightness. Interestingly, the regional patterns in the ECI tell a somewhat less straightforward story. In the South, the ECI shows little trend, rising only 2.2 percent on a 12-month basis for each of the past three quarters. The Midwest has shown more of a trend, but for the 12 months ending in the first quarter, it grew only 2.4 percent. In general, other than in the Northeast, the ECI has increased only modestly. It turns out that a large portion of the increase in 2015:Q1 had to do with a sizable jump in compensation for private industry workers in New England. The seasonally unadjusted quarterly change from the previous quarter was about 20 percent. On a Q4-over-Q4 basis, the rate of growth was 7½ percent. The increase was even larger for the wages-and-salaries component, indicating the jump was likely not concentrated in benefits.

There are several issues associated with how to interpret the New England ECI reading. For instance, the jump in the ECI was mostly driven by incentive-paid occupations, such as sales. It's dubious, however, that changes in pay for performance from sales commissions reflected genuine change in labor costs rather than just an improvement in demand conditions. In addition, while the BLS did not provide us with the underlying compensation details, in terms of industry and/or occupation in the New England region, it did mention that, in addition to sales, professional business services—namely, computer design, legal services, and scientific and architectural design—were the main drivers of the outsized increase in the first quarter. Other wage data sources, however, do not corroborate such an explanation. For example, the average hourly earnings for professional business services in Massachusetts does not indicate a jump in earnings in the first quarter of 2015. It's hard to think that compositional shifts in this measure would have been rapid and large enough to entirely mask the wage increases in these occupations recorded in the ECI.

Another possibility, which would complement the BLS interpretation of the recent ECI reading, is that the minimum wage laws in Massachusetts, Connecticut, Rhode Island, and Vermont have caused a jump for minimum wage workers. It may also have some effect on supervisors of minimum wage workers or workers whose salary is priced as a spread to the minimum wage. While this would reflect legislated wage pressure and one-shot level increases rather than demand-driven wage pressures, it might also help explain the New England pattern.

To check this, my staff turned to the Current Population Survey to determine the evolution of wages, both in New England and outside New England, for different percentiles of the respective distributions. Reported hourly wages in New England increased in 2015:Q1 to a greater extent than in other regions. Moreover, the distribution of reported hourly wages in New England shows some clear shift around the minimum wage cutoffs. But increases in the wages for all New England workers calculated as usual weekly earnings over usual weekly hours were much less anomalous relative to the recent past, suggesting that while it's possible that minimum wage changes played some role in the ECI increase, such a role was likely modest. In this respect, it's notable that a disaggregation of CPS usual wage data, in terms of worker skills, does not reveal any special pattern for New England in the first quarter, not even for low-skilled workers.

In the end, we're left with a puzzle. Much of the first-quarter growth in the ECI is concentrated in New England, but other data series and discussions with employers failed to corroborate the increase in the ECI. While the ECI outside New England is rising, it's increasing at a much more modest pace. And even if the New England ECI reading is accurate, it may well be a result of the augmentation of income for certain occupations and/or minimum wage earners, with little economy-wide inflationary consequences. We hope incoming data will provide more insight into the nature of recent increases in the ECI, but at this point I'd like to see more data before assuming that the overall increase in the ECI is a reflection of broad-based labor demand generated from a tightening of labor market conditions. Thank you.

CHAIR YELLEN. Thank you. President Lacker.

MR. LACKER. Thank you, Madam Chair. Our Fifth District surveys for the month of July were released earlier today. The service-sector revenue index rose 13 points to a robust level of 32, and the manufacturing activity index rose 6 points to a moderately strong level of 13. The positive signals from these diffusion indexes are consistent with recent anecdotal reports from our District. A spate of reports came in this month about business activity having returned to pre-recession levels. This caught our attention. These reports come from an array of contacts, including a banker, a building supply firm executive, an auto dealer, and a seller of sod. Reports received from the commercial real estate sector were quite positive as well, and a panel of retailers with whom we regularly convene was upbeat and said business had improved notably since last year. Interestingly, some of them said that sales have tended to be strong one month and then relatively weak the next month—which is exactly the pattern we've been seeing in the national retail sales data.

An increasing number of anecdotal reports mentioned wage increases and tightening labor markets. When I say "increasing," it's not just our impression—we went back and counted, and positive wage comments have been distinctly more frequent this year than last. A construction site specialist in Maryland said, "No one responds to ads. We've tried everything we know. We could be busier if we could get the people." Our diffusion indexes also indicate building wage pressures. Our service-sector average wage increase increased 4 points to a fairly high level of 25. As you may recall, a recent Tealbook cited this index as a good indicator of movements in average hourly compensation. In addition, our manufacturing wage index stands at 29, a relatively strong reading. Based on our surveys and anecdotal reports—and at least until I heard President Rosengren's report—I was not going to be surprised to see more firming in the national wage and compensation data in the last half of this year. But that was a very interesting report on the research you've done on the ECI. I'll have to think about that.

Speaking of the national picture, the data we've received since the last meeting are quite consistent with the outlook we had back in June, so I think I can be brief. My projections of real GDP remain similar to the Tealbook's, with economic growth through 2017 averaging between 2 and 2½ percent, and continued improvement in labor markets. On inflation, over the last four months for which we have data, the core CPI has increased at an annual rate of 2.4 percent, and the core PCE price index has increased at a 1.7 percent rate. Granted, four months might be too short an interval to get excited about, and some residual seasonality could be at work, as suggested by the staff. Still, I remain pretty confident that inflation is moving toward 2 percent. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Lockhart.

MR. LOCKHART. Thank you, Madam Chair. The tone of recent reports of the majority of our Sixth District contacts continues to be positive. Contacts reported good current activity and were increasingly upbeat about future sales. Retailers continued to affirm strengthening sales volume, especially those feeding off tourism and hospitality. Low gasoline prices are finally being cited as contributing to consumer spending momentum. A number of our interviews fell in the period of the most intense coverage of developments in Greece and China. While international events had the attention of many contacts, few expressed concern that the momentum they're enjoying will be disrupted. Hiring challenges continued to intensify for many contacts. Following a pattern we've noted over the course of the year, reports of plans to pick up the pace of wage hikes were increasingly broad based. We heard more reports than in earlier periods of investment in employee training and acquisitions as a human capital strategy.

My sense is, the incoming data have been largely consistent with the upbeat reports we heard from most of our District contacts. We expect tomorrow's second-quarter GDP report to register a substantial improvement over the first quarter, and we expect some further improvement in the second half. I believe the economy remains on a track characterized as moderate economic growth, continuing employment gains, and, by some measures, firming price pressures. This has been my baseline outlook for quite some time. Now that questions of persistence of first-quarter weakness can be put aside, my confidence in the economy's momentum is much improved from earlier this year.

Because my economic outlook is comparatively optimistic and is likely at the upper end of Committee participants' range of projections regarding real GDP growth, I'm more concerned about chances of downside risks materializing than prospects for upside developments. I'm watching the broad-based decline of commodity prices as a possible indicator of the direction of global demand. However, this is not to say that I object to this meeting's alternative B policy statement attributing a "balance of risk" view of the Committee as "nearly balanced." I'm comfortable with the domestic economic picture at this time. I think the burden of proof has now shifted from why we should lift off to why we shouldn't. To my mind, it would take a sharp deviation in the overall tone of the data over the next six weeks—more than the not unusual month-to-month noise in the data—or an abrupt deterioration in a significant risk factor, such as global economic growth, or some other material shock to dissuade me from carrying through. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Mester.

MS. MESTER. Thank you, Madam Chair. Over the intermeeting period, the Fourth District economy continued to expand at a moderate pace, with diversity across sectors similar to what we've seen over much of the year. After a strong increase to 36 in June, our diffusion index of business contacts reporting better versus worse conditions fell back to 18 in July, about the level it's been for most of the year. The lower reading largely reflects the commercial construction sector. Contacts in this sector continued to report a very strong level of activity and large backlogs but less growth than they experienced in the period before our last meeting. Conditions in the retail sector are unchanged, with a number of contacts noting higher wages rippling through the sector, given the wage increases announced by some large national chains. Financial reports indicate steady loan growth, especially for auto loans and home equity products. Manufacturers report mixed conditions. Those connected to the auto, aerospace, and construction industries report strong demand and generally good conditions, while those in sectors, such as steel, that are exposed to the appreciation of the dollar, lower drilling activity for oil and gas extraction, and falling commodity prices report slower activity.

Conditions in District labor markets continue to improve. Over the first five months of the year, the Fourth District unemployment rate has been stable at around 5¼ percent. For the year ending in May, District payroll growth continued to edge up, to 1.6 percent. This is somewhat slower than the national pace of 2.2 percent but in line with demographic differences between the District and the nation.

Turning to the national economy, the incoming data have been in line with my expectations for accelerating economic activity, further improvement in labor markets, and a gradual firming of inflation. There's been little change to my outlook since our last meeting. I continue to be more optimistic than the Tealbook.

The monthly data we've received over the intermeeting period are consistent with the rebound in GDP growth in the second quarter. Averaging the two Cleveland Fed nowcasting models puts second-quarter GDP growth at about 2 percent. It appears that the stall in growth in the first quarter was driven mainly by temporary factors, including weather and the labor disputes at West Coast ports. Although the pattern of consumer spending has been somewhat choppy from month to month, the data indicate a pickup in spending since the first quarter. I continue to expect consumer spending to be supported by labor market improvement, improved household balance sheets, and low gasoline prices. While business equipment spending remains subdued, private nonresidential construction is up noticeably on a year-over-year basis. The higher levels of sales and prices in the residential housing sector is welcome news, but I don't expect housing to be a major contributor to GDP growth over the remainder of the year.

Foreign economic growth is subdued. I expect net exports to continue to be a drag on U.S. growth, although this drag should wane over time as the rate of appreciation of the dollar slows. Although our forecast built in weakness abroad, the magnitude of the slowdown in China remains uncertain and poses a downside risk to the forecast. The situation in Greece also remains unresolved. However, I anticipate it will have a limited effect on the U.S. economy, because our direct exposure via trade and banking is limited. Greek debt is held mainly by the public sector rather than by private-sector investors, and the European Central Bank has tools to contain spillovers to broader financial markets.

I expect economic growth to rise to an above-trend pace later this year and next, which will support continued improvement in labor markets. Over the intermeeting period, payrolls continued to expand at a solid pace, and measures of unemployment and underemployment moved lower. And over the past year, the economy has created an average of 245,000 jobs per month, and nonfarm payrolls are now 3½ million above their previous peak before the recession. Although average hourly earnings remain subdued, we're beginning to see signs that wage growth is picking up. Year-over-year gains in the employment cost index rose from under 2 percent in the first quarter of last year to over 2½ percent in the first quarter of this year.

In my view, the evidence suggests that the economy is at or nearly at the Fed's mandated monetary policy goal of maximum employment. This isn't to say there aren't longer-term issues affecting the labor market. Workforce development is a key issue for this country. We want to ensure that people can enter and remain productive members of the labor force to raise our standards of living and to make us more competitive in the global economy. However, monetary policy is not the tool for addressing this important challenge. It's better served by policies focused on strengthening and increasing access to education and training.

An open question is the extent to which weakness in labor productivity growth may persist and be a cause for concern. I think this is an important question. Two of the alternative scenarios in the Tealbook involve persistently weak structural productivity growth, and they have different monetary policy implications depending on whether the weak productivity growth is accompanied by weaker household and business spending. We need a better understanding of the causes for the recent weakness in productivity growth. I think it's too early to conclude much from the recent data. As the box in the Tealbook suggests, measurement issues plague our assessment of past and future productivity growth. Analysis by the Federal Reserve Bank of

Cleveland staff found that labor productivity growth has historically been subject to large ex post revisions. In addition, within our staff model, there's little evidence that productivity helps improve forecast accuracy for employment and labor compensation. Thus, I take little signal about the near-term evolution of the economy or the labor market from the recent run of weak productivity numbers, but I do think that we need to consider the longer-term implications for our economy and for monetary policy if trend productivity growth remains low.

Inflation continues to run below our 2 percent target, but recent readings show signs of firming. On a year-over-year basis, headline CPI, core CPI, and the Federal Reserve Bank of Cleveland's median CPI measure edged up in June. The median CPI continues to run at about 2¼ percent. The Federal Reserve Bank of Cleveland's inflation nowcast, like the Tealbook, has headline PCE inflation rebounding from a decline at an annual rate of 2 percent in the first quarter to a 2 percent rate in the second quarter and core PCE inflation moving up from a 0.8 percent rate in Q1 to a 1.7 percent rate in Q2.

Longer-term inflation expectations have remained stable. After a dip earlier this year, the Cleveland Fed's estimate of 10-year inflation expectations continued to edge up in June. The Federal Reserve Bank of New York's survey of the expected inflation rate three years ahead has been at 3 percent for the past several months. The Michigan survey measure of longer-term inflation ticked down slightly in June and July, but the level is well within the range observed over the past several years. Longer-run expectations from the Michigan survey have a tendency to drift up and down with energy prices, so the recent downtick may well reflect this sensitivity, given the recent declines in energy prices.

The combination of continued stability of long-term inflation expectations, recent stabilization in measures of underlying CPI inflation, and the ongoing economic expansion and improvement in labor markets make me reasonably confident that inflation will gradually return to our 2 percent target over the medium run. Of course, there's risk associated with the inflation outlook. Since the June FOMC meeting, the dollar has appreciated a bit and oil prices have slipped. If this pattern continues, there will be downward pressure on measured inflation rates. Still, as I've indicated before, the inflation outlook is always uncertain, partly because exchange rates and oil prices are difficult to predict. Updated analysis by my staff indicates that the current degree of uncertainty continues to be in line with historical norms.

In my view, the economy can handle an increase in the federal funds rate. A small increase in interest rates from zero is not tight monetary policy, and with the economic progress we've made and that I expect to continue, I believe it's appropriate for monetary policy to take a step back from the emergency measure of having a zero interest rate. Absent significant negative surprises, I hope that we'll be in a position to take that step at our next meeting in September, which means it will be important that the communications coming out of this meeting do not preclude that possibility. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Evans.

MR. EVANS. Thank you, Madam Chair. The reports from my business contacts and directors were similar to what we've been hearing for several meetings now. Most see demand expanding at a moderate rate and were reasonably optimistic about prospects for decent economic growth in the United States. But there was broad-based concern about international developments—particularly about those related to China—and on the pricing front, there were no reports of any pickup in inflation. To the contrary, anyone with exposure to commodity markets was talking about downward price pressures.

Let me start with the positive news for the United States. The industries that I'm going to mention are quite similar to President Mester's characterization as well. Automakers and their suppliers were upbeat. GM and Ford were pleased with the recent industry numbers, and both may again be revising up their forecasts for sales in 2015. Each of them once again noted that low borrowing rates have provided important support for vehicle demand. Also on the consumer front, my director who runs Discover credit cards said the company has seen a modest increase in retail usage over the past six weeks. This is notable because earlier this year, he gave us a bit of an early read on the weaker PCE data that we ended up getting. I received positive reports regarding multifamily residential construction. Urban markets are particularly strong.

On the other hand, businesses that manufacture heavy equipment continue to experience sluggish domestic demand, even aside from the weakness in their oil and gas-related businesses. Nevertheless, most contacts in this area are optimistic that energy-related investment will stabilize and demand from other sectors will pick up, leading to stronger equipment sales in 2016. I heard similar commentary about the demand for steel in 2016 from ArcelorMittal.

The heavy equipment and steel manufacturers also have a lot of exposure to international developments, and here the story from them and my other contacts is pretty downbeat. The largest worry is China. Indeed, several of my contacts characterized the situation there as "troubling." There's widespread concern that China will not be able to sustain the more modest 7 percent growth target laid out by the Chinese government planners. Such an outcome likely implies continued softness for businesses with significant exposure to commodity markets and, more generally, for China's major trading partners. It could also further elevate the dollar, leading to stronger headwinds for U.S. economic growth and inflation.

Combining my contact reports with the data we've received over the intermeeting period, my forecast for GDP and inflation are essentially unchanged from my June SEP submission. Adjusting for differences in our views about potential, my economic growth forecast is close to the Tealbook, and this results in resource gaps essentially closing by late 2016. My inflation forecast has PCE prices rising 1.7 percent in 2017. This is the same as the downwardly revised Tealbook projection, but my forecast builds in a later policy liftoff. While these inflation forecasts are on the low end of the SEP submissions, I'm still concerned that they may be overly optimistic. We've seen little upward movement so far in core inflation. Without something at least beginning to show up in the data, I find it difficult to write down a forecast that has inflation returning to target within the current projection period. Indeed, the only statistical model we have in Chicago that generates a reasonably optimistic increase in inflation is one based largely on mean reversion to a constant, and that forecast still falls short of our 2 percent objective, even in 2017.

In sum, the international situation presents an important downside risk. I think we're well on track to achieving our employment mandate, but I'm still worried about when inflation will finally begin to rise to 2 percent. With the evidence in hand today and the knowledge of the uncertainty surrounding the inflation process, I cannot yet write down a baseline forecast that has us achieving our inflation mandate within a reasonable period of time. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. First Vice President Holcomb.

MS. HOLCOMB. Thank you, Madam Chair. You may be familiar with the Mark Twain quote, "The rumors of my death have been greatly exaggerated." Although it turns out that he never exactly said those words, they are apropos to the state of the Texas economy at this stage.

Since the June FOMC meeting, we've received more evidence that Texas has weathered the energy bust better than expected. Texas employment expanded in June for the third month in a row and is up at an annual rate of 1.7 percent since March, a full percentage point above the growth rate recorded over the first three months of the year. As the data stand today, March was our only month of outright job declines. June job growth extended even to the oil and gas sector, where employment increased by 4,100 jobs out of a total increase of 17,800 jobs. Construction-sector jobs also edged up after three consecutive months of decline. The Texas unemployment rate is back down at 4.2 percent after a blip upward to 4.3 percent in May. That 4.2 percent jobless rate matches our pre-recession low from 8 years ago. You have to go back more than 14 years to January 2001 to find a lower rating. Texas, at least, is at full employment. We continue to hear reports of tight labor market conditions.

Our Texas business outlook surveys—which cover the manufacturing, services, and retail sectors—capture the recent acceleration in economic activity and suggest that it extended into July. Headline indexes had reached multiyear lows in May but bounced up in June and maintained or increased those gains in July. The manufacturing sector continues to contract, but at a substantially slower pace. Retail has been uneven but has now been moderately positive for two straight months. The service sector has gone from weakly positive to solidly positive. Across all three surveys, respondents have become more optimistic about their companies' prospects over the second half of 2015.

May was the wettest month on record in the state of Texas, with an average of almost nine inches of rain across the state. Housing starts plunged 17.6 percent as a result, and some builders have been limiting sales so that they can catch up on their backlogs. This bodes well for construction now that drier summer weather has arrived. Our housing contacts confirm this expected bounceback.

While there have been definite signs of improvement in the Texas economy, year-to-date job growth of 1.2 percent remains quite modest by Texas standards. We continue to battle the effects of a strong U.S. dollar, uncertainty in Europe, and weaker global growth.

Recently, oil prices have resurfaced as a concern. At our June meeting, I reported that energy industry contacts were expecting some near-term softness in crude oil followed by a firming later this year and through the first half of 2016. Well, we've certainly seen the near-term softness. From about $60 per barrel in mid-June, WTI has slipped below $50 in response to increases in Saudi and Iraqi production and an inventory buildup in Cushing, Oklahoma. Even before the proposed deal with Iran was announced, our contacts had begun to revise their forecasts, pushing back any significant firming of prices until the second half of 2016. There's a dichotomy between large producers in areas with highly productive wells and smaller producers with wells mostly in less productive areas—the former believe they can survive sustained $50 oil, the latter cannot.

The West Texas oil patch and Houston have been hit hardest by the slowdown in the energy sector. One executive likened drilling activity in the Permian Basin last year to a "drunken frenzy." At the peak of the boom, the Permian had imported 30,000 workers from other states and other areas of Texas. This is no longer the case, and in Houston—headquarters for much of the U.S. energy and petrochemical industry—employment has been flat over the past six months. Office construction has fallen to 11.8 million square feet from 16.3 million square feet in the second quarter of 2014, and the office vacancy rate is on the rise. Petrochemical producers have seen their cost advantage over foreign competitors eroded because of the strong dollar and the fall in oil prices relative to natural gas. Domestic demand is sluggish, too, due to weak growth in U.S. industrial output. Petrochemical construction projects scheduled for completion in 2016 and 2017 are proceeding, but projects that were slated to turn on after that will likely be indefinitely delayed or canceled. We will be carefully watching the effect of these slowdowns on overall economic progress in the hope that reality doesn't catch up to the rumors.

At the national level, everything points to the economy being on the path that we thought it was on at the time of the June FOMC meeting. We've seen ongoing improvement in labor market conditions, including a further decline in the unemployment rate and job gains that considerably exceed those that can be sustained over the longer term. And realized headline inflation has bounced upward. We note that since January, CPI inflation has averaged an annual rate of 2.9 percent and PCE inflation has averaged 2.1 percent. These data confirm that recent very low 12-month headline inflation rates have a large transitory component. That the economic outlook hasn't appreciably changed doesn't mean that nothing important has changed. Slack continues to be eliminated, which reduces our maneuvering room and should increase our confidence that we're on track to achieve price stability over the medium term. In other words, the case for action to scale back accommodation is strengthening, which will be discussed tomorrow. Thank you.

CHAIR YELLEN. Thank you. President Harker.

MR. HARKER. Thank you, Madam Chair. Economic activity in the Third District continues to grow modestly, about the typical pace for the region. Employment growth in our three-state region has remained steady over the past three months at 1.4 percent, with Pennsylvania experiencing the highest employment growth of our three states. Steady job growth led to a 0.2 percentage point decline in the unemployment rate, to 5.6 percent in June.

Our unemployment rate is a bit higher than the nation's, in part due to our somewhat higher participation rate—a rate that has been gradually increasing over the past 12 months.

Reflecting the softness in manufacturing nationally, the general activity index in our July manufacturing Business Outlook Survey came in barely positive at 5.7, returning to single-digit territory where it had been for most of the year. Both the shipments and new orders indexes declined as well. However, optimism prevails in this sector as the future general activity index rose to a solid 41.5. Manufacturers in our District are definitely viewing the recent weakness as temporary. They also indicate that they have little pricing power. One of our contacts, who has interest in a diverse range of manufacturing activities, reported that the reason wage growth has been so subdued is a lack of pricing power. Wage growth is unlikely to pick up until some degree of pricing power returns. Although this is anecdotal, his comments reinforce the message that a number of you have made, both around this table and in your speeches, that inflation leads wage growth and not the other way around.

The service sector also showed some unexpected signs of weakness in the District. The nonmanufacturing Business Outlook Survey index for the current conditions decreased substantially in July. The series is quite volatile, and historically lower-than-average numbers are common in July, but seasonality is only part of the story. Much like our District's manufacturers, firms in this sector remain optimistic about future activity.

Housing in the region continues its slow recovery. But growth in the multifamily component entirely accounts for that recovery, with permits for single-family housing actually declining. Growth in northern New Jersey has been particularly robust, but Pennsylvania and Delaware are also outpacing the nation in multifamily housing activity. House prices appreciated moderately in May, but at about half the national average.

Turning to the nation as a whole, I view the decline in GDP in the first quarter as mainly reflecting problems with seasonal adjustment. Doubly seasonally adjusted GDP grew at a rate of 1.7 percent, GDI grew at a 1.9 percent rate, and GDPplus grew at a 2.4 percent rate in Q1. So I'm not overly concerned with the weak expenditure data reported in the first quarter, and I'm optimistic that the economy will rebound in the second half of the year a bit more strongly than suggested in the Tealbook.

Despite the weak recent data on consumer activity, strong fundamentals lead me to believe that the consumer will underpin an economy that should perform at or a bit above trend over the next year or so. Continued strong job growth, falling unemployment in both U-3 and U-6, and the labor market dynamism reflected in the JOLTS data point to an end of labor market slack in the near future. A lot of progress has been made. Further, I found the recent work by Didem Tüzemen and Jonathan Willis of the Federal Reserve Bank of Kansas City to be quite compelling. The authors indicate that match qualities have improved in the labor market over the past year or so, and that even those with less than a high school education are finding highly skilled employment. A contact in my region confirms that, as we heard previously, firms are engaging in more training and apprenticeship programs in order to find people to fill jobs that require higher skills.

The recent news on inflation has reduced my concern about disinflationary pressures, even though inflation remains a bit on the low side. As mentioned previously, headline CPI inflation has accelerated a bit of late, and other measures of inflation, such as the trimmed mean measures that are computed at the Reserve Banks of Dallas and Cleveland, are not very far behind our target. Further, expected inflation measures produced at Cleveland and our own SPF survey have remained stable and are also near our inflation target. I am thus persuaded that inflation will most likely gradually return to target. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President George.

MS. GEORGE. Thank you, Madam Chair. Employment in the 10th District declined in recent months primarily because of weakness in the energy and agriculture sectors. Manufacturing activity decreased, although services continued to expand. Contacts in both services and manufacturing expect activity to increase in the coming months. And wage and salary growth picked up slightly outside energy-dependent areas. The residential real estate market remains tight, with low inventories across most of the District. House prices continue to rise, leading to a decline in housing affordability. Yet, despite low inventories and rising prices, residential construction activity continues to increase only at a modest pace. Excessive rainfall in parts of the Midwest have boosted corn prices, although profit margins in the livestock sector have declined as cattle and hog prices softened and input costs remained elevated.

Finally, District energy activity continued to decline in the second quarter but at a slower rate than earlier in the year. And expectations for future activity were slightly positive in our quarterly energy survey conducted in late June. This modest optimism was, in part, due to less tightening of energy financing than had been expected, along with domestic oil prices remaining at about $60 at that time. However, many firms were concerned about another oil price drop—which has since occurred—as it would likely cause energy activity to contract further.

For the national economy, my outlook for the medium term is little changed. With the first-quarter weakness proving transitory, I expect economic growth to pick up during the year and average around 2 percent in 2015 before moving up a bit higher next year. Healthy growth in household spending is a key aspect supporting my forecast. And, in terms of the labor market, the declines in the unemployment rate and the broader U-6 measure in June indicate that labor market slack continues to diminish.

Regarding the inflation outlook, with the unemployment rate close to its natural rate and continuing improvement in the labor market, inflation seems poised to firm in the second half of the year. Despite the stronger dollar and lower oil prices, we have seen four solid monthly increases in the core PCE price index, giving me reasonable confidence that headline inflation should return to the 2 percent goal over the medium term. Looking at inflation expectations, Tealbook A noted that some measures of longer-term inflation expectations, including the median five-year-forward measure from the Survey of Professional Forecasters, have edged down during the past years, and that this could suggest a risk of a downward shift in expectations. I asked my staff to look at this more closely, and they found that the individual longer-term forecasts for PCE inflation in the SPF resulted because a number of forecasts above 3 percent had steadily fallen since the recession, and the very high outliers have disappeared. In contrast, the number of forecasts below 1 percent have remained steady. Although this could lead the median to decline, I see the reduction in outliers as consistent with better-anchored expectations. Thank you.

CHAIR YELLEN. Thank you. President Williams.

MR. WILLIAMS. Thank you, Madam Chair. Data released in the past few months underscore the transitory nature of the measured first-quarter weakness and confirm that the economy is on a solid growth path. Looking forward, I expect real GDP growth to average about 2½ percent for the remainder of the year before slowing to a more sustainable pace next year. With growth above trend, I expect continued progress in closing output and unemployment gaps and in moving inflation back to our 2 percent target.

The ongoing improvement in economic conditions means that we're very near to achieving our employment objective. The question is, how close are we? Labor market conditions have unequivocally improved. Job growth is averaging more than 200,000 jobs per month so far this year, well above the roughly 100,000 per month that we need to keep up with trend labor force growth. Consequently, unemployment and other measures of labor utilization, such as the broader U-6 measure, have steadily declined. At the same time, job vacancies and perceptions of job availability have improved substantially. And quits, a barometer of the confidence workers have in the labor market, are only a tad above pre-recession levels.

The improvement in the labor market data is echoed by my contacts. They tell me it's getting more difficult to hire workers—and that's not just high-tech workers, but also those needed to fill medium- and lower-skilled jobs in sectors like construction. I'm also hearing concerns about retaining workers. For example, a large trucking firm in my District reports unusually high voluntary turnover—up to 100 percent annually.

Of course, a few labor market indicators are still lagging behind, including involuntary part-time work and labor force participation. But, as I have reported previously, it's clear that some portion of the shift in these measures reflects longer-standing changes in demographics and in the labor market that are beyond the reach of monetary policy. Wage growth is another measure that typically lags until unemployment draws nearer to its natural rate. Consistent with this pattern, we've started to see signs of a pickup in labor compensation. And like the Tealbook, I expect further acceleration as the labor market tightens further.

Like President Lacker, I found President Rosengren's comments about the minimum wage and the regional nature of the increases in the employment cost index very interesting. I suppose I viewed at least a significant portion of the increase of the minimum wage as reflecting economic forces. And I know it's a political decision, but often it reflects labor market conditions, too. So it's an interesting issue: to what extent, historically, have minimum wage changes or other legislated labor changes actually been endogenous responses to economic conditions versus some kind of one-time exogenous factors? But I do think it's a really interesting question to think about.

To sum up, the steady improvements in the labor market mean we're closing in on full employment. In fact, in my forecast we reach a natural rate of unemployment this year and fall below it for much of 2016. By contrast, the progress in our inflation objective has been less clear, with our preferred measure still running well below target. Still, I expect that we will reach our 2 percent inflation objective by the end of next year. And for those who ask what I mean by that, I just mean the quarterly rate. I don't mean the four-quarter change. Ah, I'm not as crazy as you thought. [Laughter]

Longer-run inflation expectations remain well anchored, and I expect additional firming of price inflation with increased activity and further tightening of the labor market. Moreover, the key factors depressing current inflation—namely, the oil price declines and the dollar appreciation—are transitory. Much of the effect of last year's drop in oil prices has moved through the pipeline, so to speak, and very recent additional declines in oil prices reflecting optimism about renewed Iranian oil exports should only temporarily depress inflation.

A bigger concern is the dollar appreciation, which has been sizable over the past year and may well continue. The dollar appreciation has a considerable but transitory effect on inflation. The consensus from recent research is that a 10 percent rise in the dollar knocks about ½ percentage point off core inflation in the first year. This effect alone explains much of the shortfall in core inflation that we've been seeing of late. Importantly, though, this effect quickly fades. Based on this evidence, I expect the effects of the past dollar appreciation and recent dollar appreciation on inflation rates to largely disappear by next year. Looking ahead, there are concerns that our policy normalization, coupled with continued easy monetary policy abroad, will lead to renewed dollar appreciation, and obviously that's a risk. But here I agree with the Tealbook: Further appreciation in the dollar is likely to be moderate. Our upcoming policy normalization is widely anticipated and should be reflected in markets' expectations.

Adding up all of these considerations, I expect we'll achieve our 2 percent inflation target in the next few years as underlying inflation moves toward our goal and temporary factors dissipate. Still, more data are needed to say confidently—I have to cheat, everybody else does, and get a little policy discussion into this go-round—that our return to our 2 percent goal will be timely. I'll have more to say on that tomorrow. Thank you.

CHAIR YELLEN. Thank you. President Bullard.

MR. BULLARD. Thank you, Madam Chair. The Eighth District economy continues to expand at a moderate pace. News from District contacts has not changed appreciably from our previous meeting in most dimensions. Anecdotal reports of tight labor market conditions have become commonplace. A very wet spring has significantly reduced the percentage of crops in good condition. Declining commodity price prospects generally have reduced expectations for farm income for 2015. Unemployment in District MSAs is exactly at the national average, according to the most recent reading. Housing markets seem stable, and District home prices are rising but are not as volatile as in the nation as a whole.

I'm going to spend the bulk of my comments on the national economy and, in particular, on the unemployment forecast. I continue to see the staff's unemployment forecast as somewhat out of sync with more mainstream views. I see the staff's forecast as, at certain points, based on a more stretched interpretation of certain aspects of the data than I think is wise to use as a basis for U.S. monetary policy. Pages 2 and 3 of Tealbook A show that the staff's forecast path for real GDP tends to be lower than private-sector forecasts, as described by the Blue Chip as of July 10, 2015. Similarly, the staff forecast for unemployment tends to be higher than private-sector forecasts, as described by the Blue Chip. The staff's forecast of unemployment falls to 5.2 percent by the end of 2016—just 0.1 percentage point lower than today over the next 18 months—and to 5.1 percent by the end of 2017—just 0.2 percentage point lower than today over the next 2½ years.

I have said before that I do not see this as a credible forecast, taking into account the declines in unemployment in the recent past. My view is that unemployment is more likely to continue to fall further, and that this should be part of the baseline case for this Committee. One piece of support for the idea that unemployment will fall further comes from the historical series given on page 15 of Tealbook A. The unemployment rate fell to below 4 percent in the late 1990s; it fell to the middle of the 4 percent range in the 2000s. In view of the low interest rate environment that's anticipated over the next few years, and barring an adverse shock, the historical experience of the most recent two expansions is, I think, the best guide to likely developments in the next few years.

Page 20 of Tealbook A contains alternative scenarios for unemployment. Key assumptions are, one, that the ratio of payroll employment to Current Population Survey measures of employment is rising, and, two, that the labor force participation rate will return to an estimated trend line. I do not think these are good baseline assumptions. The ratio of payroll employment to CPS employment has risen recently, but it did not rise during the 2002–07 expansion. It has moved up but may or may not rise further. The labor force participation trend is on page 29 of Tealbook A. This is, indeed, an unusual trend line that has not made any contact with the data over the past five years. The trend is, in fact, everywhere above the data. This strikes me as a stretched interpretation of the participation data. A more reasonable interpretation would accept the empirical evidence and fit a trend line to the existing data. In other words, the trend line would run through the data. This would likely suggest less future improvement in the labor force participation rate.

The Tealbook also provides what the unemployment forecast would be without these assumptions. On page 20, changing either assumption would send the unemployment rate below 4½ percent over the forecast horizon. Changing both assumptions likely sends the unemployment rate below 4 percent over the forecast horizon. Some version of these alternative scenarios would provide a better benchmark case for this Committee, in my view, and would be more consistent with available private-sector forecasts. An additional consideration in my mind is that weekly initial unemployment insurance claims are at the lowest level in decades and that, indeed, if one adjusts for the size of the labor force, the claims are even lower than in historical experience.

Finally, Tealbook A also provides a past evolution of the forecast on page 33. The forecast for 2014 end-of-year unemployment and 2015 end-of-year unemployment estimates were initially high when they were made in 2012 and 2013 and have declined more or less continuously since that time. In other words, the staff unemployment rate forecasts have consistently been too high—too pessimistic about unemployment improvement. Importantly, this is despite real GDP growth forecasts also being too high over this period. One would have expected that the slower growth would have made the unemployment forecast more nearly correct, but the forecast unemployment rates are still too high.

This is all my way of explaining some of the differences between my forecast and the staff forecast. One implication would be that, using only the staff model, there would be more upward pressure on inflation than is suggested in the baseline forecast. On this, I would note that the Blue Chip CPI forecast for 2016 is 2.3 percent. If we subtract 0.3 percentage point from that to translate it into PCE inflation, then headline inflation is projected to be at target by private-sector forecasters by the end of next year. This strikes me as a reasonable expectation. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kocherlakota.

MR. KOCHERLAKOTA. Thank you, Madam Chair. Before I talk about what I prepared for these remarks, I wanted to touch on some of the issues that have been brought up in others' interventions.

There is a lot of discussion about a "transitory first quarter," and I just wanted to clarify the meaning of that. In growth rate terms, it's correct that we don't see the very low growth rate that we saw in the first quarter—of near zero, below zero, or maybe we'll see the revisions later this week that will push it a little bit above zero—carried forward into the second quarter, third quarter, or fourth quarter. Rather, we see more robust growth in those quarters. But many of the stories with regard to that "transitoriness" are actually stories that you would not expect to show up in the level of GDP. On the other hand, the low growth that we saw in the first quarter is actually translating into distinctly lower levels of GDP at the end of the year than at least I had anticipated going into the year. We're not seeing a 3 percent growth rate overall. We're not seeing catch-up in the second and third quarters. So I think when we use the word "transitory," the stories we tell for that transitoriness should be stories that actually lead to a permanently lower level of GDP going forward to the end of 2015. The seasonal adjustment story has that flavor, but some of the other stories, such as the port strikes and others, seem much more challenging along those lines.

For the second issue that came up, I was very interested to hear from President George about the Federal Reserve Bank of Kansas City's analysis of the SPF, about how some of the decline in the forecast is from losing the inflation nutters—those forecasting the 3 percent and above. Losing those forces in the market is actually a challenge for us. If you have folks in the market that are betting on inflation being above 3 percent, that helps keep the real interest rate low and helps stimulate the economy. If those folks are exiting the market—are not betting that inflation is going to be high—that actually serves to drive up the real interest rate and push down stimulus, as long as we're keeping the nominal rates the same, or the expectations of nominal rates the same. This is in line with the idea, which I haven't voiced publicly yet, that Allan Meltzer was actually one of the big forces for accommodation in the past five years, because the idea that inflation was going to be high in the years ahead was actually a very positive force for this Committee, in light of the fact that we're not able to drive nominal interest rates lower.

MR. WILLIAMS. Was that a beta test of that argument?

MR. KOCHERLAKOTA. It was a beta test, yes. [Laughter] Maybe a gamma test.

MR. EVANS. Well, Allan says people don't always understand nominal versus real, and this argument demands that people understand nominal versus real.

MR. KOCHERLAKOTA. Let me turn to a discussion of what I prepared. Madam Chair, I'll first talk about local economic conditions in the Ninth District, then I'll talk about international risks, and I'll close by presenting what I see as a key feature of the inflation outlook.

By some metrics, the Ninth District labor market looks very strong. The unemployment rate has fallen to 4 percent in the Ninth District. Indeed, the four states that are located entirely in the District—Montana, North Dakota, South Dakota, and Minnesota—all have unemployment rates below 4 percent. Yet other metrics suggest the labor market recovery is not yet complete in the Ninth District. Thus, on average over the past 12 months, the fraction of people aged 25 to 54 in the Dakotas and Montana who have a job remains more than 2 percentage points below its 2007 level. And the fraction of those aged 16 and over who work part time for economic reasons remains high in Montana and South Dakota. But yet, in Minnesota, the metrics are consistent with a more complete labor market recovery. On average over the past year, the fraction of people aged 25 to 54 who have a job has returned to its 2007 level. The fraction of people over the age of 16 who are working part time but would like a full-time job has fallen back to its 2007 level. So if you look at Minnesota, the full range of labor market metrics—the unemployment rate, the PTER, and the 25-to-54 EPOP—have all come back to 2007 levels.

Despite these strong labor market metrics, however, inflation is not unduly high in Minnesota. Both core and headline CPI inflation remain at or below 2 percent in the Minneapolis–St. Paul metro area. Notably, there are little signs of inflationary pressures, even in nontradables. The BLS reports that, in 2014, the inflation rate for services was essentially the same in the Twin Cities as it was nationally. I think Minnesota's experience gives some confidence that a broad range of national labor market metrics can return to pre–Great Recession levels—possibly even better—without generating undue inflationary pressures.

That's on the Ninth District front. Let me turn to international risks, where I see two key risks. One is well captured by the alternative scenarios regarding recent developments in China in which adverse international events cause a deterioration in global demand and in global financial market conditions. The result is that inflation in the United States remains below target for an even more extended period of time than in the baseline, which enhances the risk that longer-term inflation expectations will slide downward further. One way to mitigate these risks that the alternative scenario does not consider is to delay the date of liftoff beyond the September 2015 meeting. By delaying the date of liftoff beyond that considered in the alternative scenarios, the Committee would essentially be taking on insurance against these eventualities.

The second international risk is associated with our own actions regarding the stance of U.S. monetary policy. There is a risk that interest rate increases, especially in the absence of any obvious inflationary pressures, could lead to rapid changes in financial market conditions abroad that could then feed back domestically. In that case, we could well see large capital outflows from the EMEs and Europe as investors seek to take advantage of higher U.S. interest rates. These outflows could have adverse consequences for the U.S. economy in at least three different ways. First, they could create global financial instabilities that would be problematic. Second, the dollar could rise rapidly, creating downward pressures on the demand for U.S. goods. And, third, the EMEs could feel forced to tighten their own monetary policies in order to keep domestic inflation under control, which would then push the demand for U.S. goods down further. Thus, on the international front, I think there are two risks overall: One is associated with exogenous events, and the other is more endogenous to our own actions.

Finally, let me turn to an assessment of the national inflation outlook, although, I have to say, not much has changed in this dimension from our previous meeting, Madam Chair. Under the policy stance of Tealbook A, the Board staff projects that inflation will return to target only after 2020. The policy stance in Tealbook A is actually considerably more accommodative than what's described in the most recent median S&P forecast, which raises serious concerns that the actual policy choices of the Committee will result in an even more protracted deviation from the inflation target.

As I’ve suggested before, I think there are good reasons to put a lot of weight on the market-based forecasts of inflation as guides to policy, and these are telling a similar story to what’s implied by the Board staff’s outlook. Zero-coupon inflation swaps imply a CPI inflation rate of 1.7 percent over a period of one to two years from now. That would translate to something on the order of 1.3 to 1.4 percent in PCE terms. The four-year, one-year forecast, which projects what inflation will be in 2020 based on the zero-coupon inflation swaps, is still very low—1.6 percent in PCE terms. Madam Chair, the modal inflation outlook strongly suggests the need for further accommodation. Here I’m sneaking into policy.

MR. FISCHER. We surely noticed. [Laughter]

VICE CHAIRMAN DUDLEY. Dragging it in.

MR. KOCHERLAKOTA. The risks to the outlook, though, are skewed further to the downside because of the constraint posed by the zero lower bound. Risk-management considerations also push in the direction of additional accommodation. But I’ll talk more about that tomorrow. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you, Madam Chair. My views haven’t changed much since the June meeting, and they don’t differ very much from the Tealbook’s forecast. With respect to economic growth, I think there are both positives and negatives. Together they add up to perhaps a 2 percent growth rate in the second half of the year, with the risks about balanced around that trajectory.

I'd put the outlook for consumer spending and residential investment on the positive side. Household spending should be well supported over the near term by solid job gains and a saving rate that is higher than what one would expect on the basis of the level of net worth relative to income. And the Iranian deal, if it holds, increases the likelihood that oil and gasoline prices will stay low for an extended period, which may also help free up some additional spending. I see several positives with respect to housing, including the relatively low level of housing starts relative to employment growth and the easing of lending standards for residential mortgages evident in the latest Senior Loan Officer Opinion Survey on Bank Lending Practices. Housing is a part of the economy—unlike motor vehicle sales, for example—that one can argue is still cyclically depressed.

On the negative side, I would expect trade to remain a drag and inventory investment to fall, given the fact that inventory accumulation rates during the first half of the year were quite high. The biggest risk in my mind, though, remains the employment trend, which has been very sturdy relative to the pace of economic growth. If that trend stays intact over the next few months—I'm going to speak on the monetary policy part here—then I think the case for monetary policy liftoff will be quite compelling. But I am reluctant to count on those chickens just yet.

With respect to inflation, I continue to become less worried that inflation will remain persistently below 2 percent. This reflects several factors. First, the trend of core inflation has flattened out despite the damping effect of lower oil prices and a firmer dollar—influences that will likely prove to be transitory. Second, a tighter labor market is likely to translate soon into higher compensation trends. While I know that the linkage between wages and inflation is very tenuous, I still believe that pressure on resources does matter in terms of affecting the inflation outlook. And, third, my own reading is that there is some scope for higher inflation from a firmer trajectory for shelter and health-care costs. As we all know, these components have a significant weight in core inflation measures.

Now, I do have one nitpick with the Tealbook—as I said, I mostly agree with it. But Tealbook A, after noting on page 19 that "readings on longer-term inflation expectations have changed little over the intermeeting period," goes on to say that "some of these measures seem to have edged down during the past handful of years." Now, that's not really new information. These developments, Tealbook A continues, "suggest a downside risk to our maintained assumption that expectations will remain well anchored." Well, I'm not sure I share this view—and I'm channeling President Mester a bit here, I think—because the size of these changes is not that large. It's on the order of 15 to 25 basis points. And as Loretta pointed out, the University of Michigan measure tends to get bounced around by the trajectory of oil prices. So some of the decline that you see in the University of Michigan measure may just reflect the oil price trends. Moreover, as President Mester also pointed out, some measures of consumer inflation expectations have moved higher recently. For example, the Federal Reserve Bank of New York's Survey of Consumer Expectations has shown a clear uptick in expected inflation at the one-year and three-year time horizons in recent months. The one-year median expected inflation rate has risen 27 basis points since April, to 3 percent. And the three-year median expected inflation rate has risen 8 basis points since March, to 3 percent as well. Now, I wouldn't overemphasize those increases. They're not very large, either. But I think it does push against the notion that there's compelling evidence that substantial risk to the downside in terms of inflation expectations are emerging. I just don't think the data really support that conclusion.

Finally, I just want to talk a little bit about this issue of how much excess slack there is in the labor market. The Federal Reserve Bank of New York staff has done a lot of work on the issue of how much hours worked would increase if the other measures of unemployment, like U-6, were to be normalized with the actual level of the unemployment rate measured by U-3. Ayşegül Şahin, who is sitting over here, has done a lot of work on this. And when you actually ask yourself the question of how much hours worked would you get if all these other measures normalize, it's not as much as you might think or hope. It suggests that maybe the unemployment rate overstates the tightness of the labor market by about ½ percentage point. In other words, if you could get U-6 down to where you'd expect it to be relative to U-3, you might get about ½ percent of additional hours worked. So it points in the right direction of saying that you have some extra labor market slack, but it's not a huge increment of slack, in my opinion. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Fischer.

MR. FISCHER. Thank you, Madam Chair. The picture of the economy presented in the July Tealbook is consistent with, but a bit weaker than, that presented in the June Tealbook. Personal consumption expenditures are expected to continue to grow at an annual rate of a little more than 3 percent over the remainder of this year, while residential investment is expected to grow at more than 5 percent—a good rate, albeit lower than predicted six weeks ago. Nonresidential private investment is expected to grow at a rate slightly higher than GDP and more rapidly than expected in the June Tealbook, although very recent declines in the price of oil may reduce investment relative to the current forecast for the second half of the year. Government purchases for the second half of the year are expected to grow very slowly, at a rate well below the rate of growth of GDP. And net exports are, of course, expected to continue to decline relative to GDP in the second half of this year and to reduce the growth rate of GDP in the second half by about 0.7 percentage point.

The staff attributes much of the subdued performance of GDP in the first half of the year to two factors: first, the decline in net exports, and, second, the effects of the lower price of oil on drilling and mining investment. These are both related to factors that have also contributed to the lower rate of PCE inflation. Particularly interesting is the effect of lower oil prices on GDP growth, which seems to be negative—at least in the short run—rather than positive, as we had expected when the price of oil began its significant decline. Our fear from six weeks ago that events in Greece and China could produce major disturbances in Europe and globally, respectively, in the short run has been significantly reduced by the agreement on a third stabilization program reached with the Greek government earlier this month and by the actions taken by the Chinese government to stabilize the stock market, although the Shanghai Stock Exchange has yet to be stabilized.

At the June meeting, I was worried that the underlying strongly positive trends in the economy—especially in the labor market, where monthly increases in employment had averaged 260,000 in 2014—could be slowing. That fear was exacerbated by the March increase in employment of only about 120,000, a figure we knew at the June meeting. The fear was alleviated by the second-quarter monthly rate of increase of employment of 220,000 and the staff's forecast monthly rate of increase of 210,000 for the second half of the year. Thus, the labor market is expected to continue to perform well in the years ahead, albeit with a participation rate that is not expected to rise through 2017. This outcome is consistent with the staff's judgment that the rate of unemployment will continue to decline very slowly.

The Tealbook is an excellent document, but it may be a bit too interesting, for it includes so many interesting details. [Laughter] We could go back to the longer version. It includes so many interesting details that there are inevitably some facts or trends in it that point down and some that point up, on one or the other of which we are often inclined to expand. I have just been doing that. But we need mainly to look at the overall picture of this economy. The overall picture is of an economy growing slowly, at a rate of about 2 percent or a bit higher, but with a labor market that has worked remarkably well over a long period despite having had to contend with hardly any support from fiscal policy, an appreciation of the dollar that has significantly reduced aggregate demand, and some surprisingly negative influences from the decline in the price of oil.

As of now, the unemployment rate is near most estimates of the longer-run rate of unemployment projected by participants in the SEP, and it is projected to continue declining. When exactly we will reach the longer-run rate, as defined by SEP participants, is hard to say because the Committee's views on the natural rate can change and because there are margins of slack remaining that are not adequately captured by the difference between the unemployment rate and the estimated natural rate of unemployment.

I would now like to revisit and repeat some points I made at last month's meeting. First, it is worth reemphasizing that the labor market has, for some time, seemed much stronger than the GDP data. Since early last year, the unemployment rate has declined by well over 1 percentage point. The difference in the behavior of output and employment has been puzzling since soon after the start of the recovery in 2009, and it was particularly stark in the first quarters of 2014 and 2015 when GDP declined. The staff generally takes the view that when the employment and GDP data appear inconsistent, the employment data are more likely to be accurate than the output data, which is to say that we should put more weight on the behavior of employment than on the behavior of GDP. Of course, we all await Thursday's revisions of the national income data with keen interest and hope, and we will have those data when we come to make our decision in September.

I remain reasonably confident that we will see inflation beginning to move back toward our 2 percent target before very long. Core PCE inflation in the second quarter was 1.7 percent, but it is expected to decline to 1.3 percent in the fourth quarter before rising to 1.5 percent over the four quarters of 2016 and 1.7 percent for the four quarters of 2017. The core CPI is expected by the staff to be 2 percent in both 2015 and 2016, to be followed by 2.1 percent in 2017. The price of oil is now declining but looks about to reach a new range from which it is as likely to move up as to move down. And the Board staff is forecasting that core import prices will resume increasing early next year, which should help support core inflation in the period ahead. As the influence of declining oil and import prices begins to wane, we will begin to see the core inflation rate moving up. Those will be the inflation rates relevant to any changes in monetary policy we put in place in the next few months.

I am reassured that inflation expectations have remained reasonably steady despite the very low levels of headline inflation. But, overall, it is not the inflation indicators today that persuade me that we will see inflation rising over our projection horizon. Rather, it is my conviction that economic slack has been diminishing and continues to diminish, and that the Phillips curve will reassert itself, as the incoming evidence is beginning to suggest.

Needless to say, I also have concerns about the outlook. In particular, consumer spending has been disappointing when we consider how real income has been boosted by lower gasoline prices. Industrial production data has likewise been disappointing, and developments in the Chinese economy have yet to play out. Yet we need to remind ourselves that all of this is taking place against the background of a labor market that is near full employment and is expected to continue to strengthen. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Tarullo.

MR. TARULLO. Thank you, Madam Chair. I agree with those of you who have said that, on balance, the economic picture hasn't really changed much since June. But I wanted to underscore the point that President Kocherlakota made that, although it's reasonably clear that we didn't begin to sink into a period of substantially reduced growth after the first quarter, this was not a repeat of last year, when really good second and third quarters made up for the very bad first quarter. So, on net, there has been a loss.

I wanted to add a few thoughts on labor markets and international factors to what some of you have already said. Before going to those thoughts, though, I did want to comment on some of the things that some of you have said already.

With respect to proposals to raise the minimum wage and actual minimum wage increases, I think there's a lot, John, to what you say about past efforts to raise minimum wages. Having been through a couple of those efforts myself, I found that oftentimes what would happen is that those who favored minimum wage increases would wait until a point at which they could make the argument that a nontrivial portion of people covered by minimum wages were already above that wage. So the net effect on employers would not actually be that great. One of the salient differences, I think, between the proposals and the things that have been enacted this time around and the past is, that argument isn't being made. On the contrary, employers are saying that, basically, they'd have to raise wages for all of their employees. That's because the political origins of this particular set of initiatives come more from this sense that, persistently and chronically, wages have not been rising. So we can't be sure about it, but my guess is that there is some difference between the effect that the minimum wage increases would have now and what I think you quite rightly intuit as past patterns.

I have a couple of other things. First, I don't know about the rest of you, but I would like to try to encourage the staff to continue to do their own economic forecast rather than to attempt to get themselves close to the median of the Blue Chip. The whole purpose of what we're asking them to do is to give us an independent, more or less coherent, picture of what they think is going on in the economy, which then allows us to see whether that's convincing, and not to try to calibrate it so that the final numbers somehow align well with what others are saying. I would also point out that the Blue Chip is itself a median. There are a bunch of people in the Blue Chip who think unemployment is going to be higher and a bunch of people in the Blue Chip who think unemployment is going to be lower. It's interesting that one of the things that, as a whole, the Blue Chip has been consistently wrong about for the past seven years is what's going to happen to inflation. So, again, while I agree or disagree with particular components of it, I think that it's really important that we encourage the staff to take an independent view.

I'll make one other comment on that. Regarding the labor participation rate trend line, again, I don't think it would be a good idea for the staff to feel that they had to get their trend line to actually track the data for any relatively short period of time. I believe the coherent argument that has been made by the staff is that, because of the nature of the crisis and the recession, there were substantial dislocations in labor markets, which are only slowly returning to what people would anticipate to be trend. They've adjusted their trend line for labor participation at least twice since I've been here, taking into account not only demographics, but also shifts that they've seen in the patterns of behavior of middle-aged and older people leaving the workforce permanently sooner rather than later. I think recent experience has validated the instinct that the staff had, because, with participation having been more or less flat for a couple of years, it's actually gotten closer to the trend line, just as they've been predicting for several years.

I'll turn now to a couple of things that I had prepared to say. On labor markets, as many people have commented, we've had continued improvement across most dimensions with the notable exception, I still think, of wages. After an upward tick, average hourly earnings ticked back down again, so they're in the same 12-month range that they've been in for quite some time. The ECI has gone up, but Eric already made the point I would have made—that the ECI, in particular, incorporates incentive pay, which has actually been pretty significant in a number of industries. So it may not be as revealing of underlying wage trends as some of the other measures. Indeed, I was thinking this weekend—in the inevitable seven- to eight-week effort to ask, "What can you say that's new?"—that I actually now believe that the story of wages in this recovery was written by Samuel Beckett. This is not an overly literary crowd, I can tell. [Laughter] But I will now elaborate, although I appreciate that the Chair got it.

MR. LACKER. It might not be a funny reference. [Laughter]

CHAIR YELLEN. We're waiting.

MR. TARULLO. Beckett had his boy character appear only twice to announce that Godot would not be arriving today but would surely be arriving the next day, whereas we have heard predictions of accelerating wages and anecdotal reports of same more or less continuously during the past couple of years. Now, while Godot never did arrive, sending Vladimir and Estragon to the point of suicide, most of us probably believe that accelerating wages will. There have been numerous efforts both inside and outside the System to determine just when that might be, based on historical correlations between accelerating wage increases in post-recession periods and other labor market indicators. I want to mention a couple of relatively recent efforts by Federal Reserve economists that I found both interesting and well thought through. But precisely because they turn out, perhaps, not to be correct, I think they're a cautionary tale about reading too much into any effort to create such correlations.

One, which I believe hasn't been reduced to a paper yet but was presented within various parts of the System earlier this year, suggests that wages begin to accelerate when the post-recession unemployment rate has declined between 70 and 80 percent of the way from its recession high to its pre-recession trough. The other, which is a little less numerically determinate, maps historical correlations between the quits rate and wage increases and concludes that a rise in the former is a good predictor of a later rise in the latter. That is a Federal Reserve Bank of Chicago Fed Letter—it was just posted on the Federal Reserve Bank of Chicago's website. With respect to the first, if my arithmetic is right—not always a foregone conclusion—we've now already retraced more than 80 percent of the increase in unemployment from the pre-recession low to the recession high without noticeable and persistent wage acceleration. And when I looked at the charts that were presented by the authors of that presentation, by the time that 70 to 80 percent had been reached, there was already a quite persistent and noticeable increase. With respect to quits, while the quits rate has been rising for some years now, it has only relatively recently gotten back into the lower end of its pre-crisis range. So it may be a little bit early to judge how well this correlation holds up in the present recovery. If I read the paper right, President Evans, I think that paper was not actually trying to make a very firm numerical determination but was instead just trying to suggest directionally that this is when you can begin to expect some acceleration of wages.

My point, as in past discussions, is that the origins of the 2007–09 recession and the ensuing recovery in a financial crisis may mean that there will be very different trajectories in the labor market, as there have been in some other areas. So we should remain open to the possibility, even the likelihood, that things won't be following the same pattern as they have been in the past several recessions and recoveries, and we have to instead look for nontransitory evidence in the data. All of that, of course, is against the backdrop of the considerable uncertainty about the relationship between wage acceleration, even when it does occur, and price inflation.

Turning to international factors, I want to talk about two that, again, several people have mentioned that carry some downside risk. The first is China. Now, I do not pretend to understand what is going on in China, and I certainly don't have very much confidence in my own assessment of the risks of a significant drop-off in economic growth there. What I've noticed is that people who speak to Chinese officials or who analyze data tend to discount the stock market turmoil and take a relatively optimistic view that China's growth will stabilize around where it's now reported to be, whereas people who do business in China tend as a group to be more pessimistic and view the overleveraged stock market as a harbinger of other problems.

Being in neither group—I guess that's not true because at FSB meetings, I talk to Chinese officials—I can readily identify cognitive biases in both groups, so I don't know whose story is more convincing. But what I think is relatively clear is that there isn't much upside risk in China these days. So, while the risks it poses to global economic growth and, through the mechanism of reduced demand for commodities, to downward pressures on inflation may be hard to quantify for now, those risks are not balanced by any realistic upside risk that, say, Chinese economic growth is going to improve to between 8 and 9 percent over the next couple of years.

On the dollar, the Tealbook already projects significant drags on U.S. growth over the next four to six quarters stemming from negative net exports, the reasons for which Steve explained in his introductory remarks. Because the Tealbook also projects only a small additional increase in the trade-weighted value of the dollar during that period, what they're projecting is mostly a J-curve effect. But against the backdrop of the Tealbook's stipulation of a September federal funds rate increase, the Tealbook projection embeds the assumption that most of the capital investment shift associated with divergent monetary policies has already been priced into relative markets. This may well be the case, but I think there are at least some reasons to think otherwise. The first, of course, is the fact that rates have been at the zero lower bound here for more than six and a half years. So there may have developed more entrenchment of positions that haven't moved so much, even in response to the increasingly explicit predictions of rate rises that many have been announcing.

Second, any near-term increase in U.S. rates will have been accompanied by a decrease in effective rates in much of the rest of the world. The only clear exceptions already are South Africa and Brazil, and the United Kingdom looms out there as potentially an exception along with us. Accommodation has been enhanced significantly in both the euro zone and Japan through their QE programs. This is a great statistic: Rate reductions by central banks in the rest of the world have outnumbered increases 44 to 4 since the beginning of the year. The 4 are, again, 2 in South Africa and 2 in Brazil. So I wonder whether the traditional pattern of markets buying on rumors and selling on the fact may not hold true here, and whether there may be the potential for greater cross-border capital flows if we increase rates before either economic or financial conditions have become more mixed in the rest of the world. The risk here is, I believe, a little more balanced than that with respect to China, because, if the Greek situation continues to be a problem mostly for the Greek people and not for the rest of the euro zone, one can definitely imagine the euro strengthening somewhat. But I think it very unlikely that there would be a significant depreciation of the dollar when we start raising rates, whereas there is at least a modest risk of a significant appreciation. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Powell.

MR. POWELL. Thank you, Madam Chair. What have we learned since the June meeting? I'm tempted to say, "Not much," in light of the paucity of new U.S. economic data in the intermeeting period. However, the little data that we have received do support continued confidence in the trajectory of the economy. Moreover, some of the near-term uncertainties on the international environment have materially diminished. The labor market has continued to strengthen. Payrolls averaged 220,000 per month in the second quarter. The unemployment rate dropped to 5.3 percent in June and now is 0.3 percentage point below last December's reading, although some of that is probably due to the 0.3 percentage point drop in the labor force participation rate in June, which it may well reverse—I certainly hope that it does. Nonetheless, labor market slack continues to diminish.

I have a comment on the box on pages 20–21 of Tealbook A. The box, on employment and unemployment in the staff projection, describes a pro-cyclical relationship between the different measures of employment in the establishment survey as compared with the household survey. That difference is a big part of what's driving the baseline forecast of a significant slowdown in the pace of decline of U-3 in the household survey in the face of still-strong payroll growth. So it's a very important box, and I applaud its inclusion in the Tealbook. As the box says, this pro-cyclical relationship has held somewhat consistently, but not totally consistently, across prior recoveries, and I continue to think that there's a significant chance that U-3 will decline faster and reach a lower level than the forecast shows, given payroll growth.

We also now have more evidence that the stalling of GDP in the first quarter was anomalous. In addition, some of the real weakness in the first half came from the drop in oilfield investment, and the recent bottoming out in oil rig counts indicates that the substantial drag from that sector may have run its course. Although the recent further decline in oil prices may spur a bit more of a pullback, I don't expect that it will be as extreme as what we've just been through. So the second half should be stronger than the first. The staff's second-half GDP forecast is notably more downbeat than that of private forecasters, most of whom seem to be at 2½ percent or above. David Wilcox noted earlier that that was principally due, we think, to net exports. We're not submitting a real GDP growth forecast for this round, but I feel that, at a minimum, there's risk to the upside.

I want to stop there for a second and echo what Governor Tarullo said earlier. I've chosen, with some trepidation, to depart from the staff forecast on a couple of items. I want to say that I appreciate that what you do is to take a position, explain it with great transparency, and not be too concerned about where the public consensus is. Then you grade yourself in the back of the book and show how the actual performance was. I think there's a lot of value in that, and I appreciate the thoughtfulness that goes into it.

One of the risks to economic growth that was frequently noted in the last go-round in June was the disruptions from developments in Greece and China, and those risks do seem much lower now, as has been noted by many around the table. There's been no important fallout to date from the ongoing Chinese stock market correction. Greece now seems to be headed toward a new deal with its creditors and not to an exit. Even if that deal doesn't get done, the measures taken over the past several years in Europe seem to have successfully inoculated the periphery from contagion from Greece. So it seems to me that the risks to our economy from international developments have diminished materially since the June meeting.

An additional risk I mentioned earlier is the risk that the expectation and reality of increasing policy rates in the United States will cause the dollar to strengthen more than forecast, causing a further decline in net exports as demand is shifted abroad. Unfortunately, this risk seems likely to be with us as long as global economic growth remains weak, and the sharp decline in commodity prices does suggest that that could be a while.

Turning to inflation, the other half of our mandate: The price and wage data clearly present some challenges. The staff estimates that total PCE inflation was only 0.2 percent for the 12 months ending in June, and that core inflation was only 1¼ percent. Of course, headline inflation is being pulled down by oil prices, and that will end. The staff estimates that core inflation is also being held down about 40 basis points by the indirect effects of energy and import prices. That would suggest that underlying core inflation may be around 1.7 percent. It therefore seems to me reasonable to expect, with some degree of confidence, that core and total inflation will move back up to 1¾ percent once these temporary factors are behind us. However, the recent decline in oil prices and the appreciation of the dollar will restrain inflation throughout the second half of this year and, to a much lesser extent, next year, and that may present a real communications challenge throughout the fall as the Committee considers liftoff.

A related challenge comes from the wage data. Wage pressures are everywhere in the anecdotes but still not that easy to find in the data. Average hourly earnings, the most prominent wage measure, rose only 2 percent over the 12 months ending in June. By contrast, as others have noted, the ECI is now at 2.6 percent over the trailing 12 months, although, as President Rosengren and others have mentioned, there are reasons to doubt the sustainability of that measure. We're going to get several readings on labor compensation before the September meeting—including another ECI, average hourly earnings, and compensation per hour—which may help clarify our assessment of labor market conditions as well as ease the challenge of communicating that assessment. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Brainard.

MS. BRAINARD. Thank you, Madam Chair. The data since June have contained few surprises on the domestic front, although the price of oil is down about 20 percent and the exchange rate is up an additional 3 percent since then. I want to underscore the observation made earlier that, while we have seen a welcome return to moderate economic growth in the second quarter, we have not seen a bounceback sufficient to compensate for the slowdown in the first quarter relative to what had been anticipated. The labor market has continued to improve steadily. Consumption remains moderate, buoyed by strong fundamentals, but apparently not strong enough to overcome the continued drag on investment and production from earlier oil price declines and the persistent effects of a stronger exchange rate. Inflation remains noticeably and persistently below our 2 percent target. Let me take each of those in turn.

The current data suggest that net exports subtracted a little over 1 percentage point from GDP growth over the first half of this year, and the staff's econometric model suggests that trade will continue to exert substantial downward pressure on demand through 2016. Given this restraint and the relatively moderate pace of increase in domestic demand, increases in overall demand are likely to remain quite limited. Although there are numerous factors supporting consumer demand—rising real income, high net worth, and buoyant sentiment—the recent data continue to suggest that consumer spending is rising at a relatively moderate pace of around 3 percent over the middle of the year. The recent data on housing starts and permits point to further gains in residential investment, but the rise in activity remains gradual and the contribution to overall demand relatively modest. The drag on business investment due to last year's sharp decline in oil prices looks to be fading, with the sharp fall in drilling rigs over the first half of this year leveling out. Even so, new orders for capital goods and measures of business sentiment suggest fairly tepid increases in investment spending over the second half of this year, and the implications of the recent drop in oil prices are as yet unclear. Meanwhile, government spending looks to add very little to aggregate demand growth this year.

The pace of improvement in the labor market has been stronger than that for aggregate demand for some time, with the difference being reflected in strikingly weak measured productivity growth. The labor market improvement has been steady but somewhat more gradual so far this year. The sizable decrease in the overall unemployment rate in the July report was offset by a decline in labor force participation; it also came with a somewhat surprising drop in average hourly earnings growth. Job gains have clearly slowed from last year's very rapid pace. Looking at a wide range of labor market indicators suggests to me that some slack still remains, even with overall unemployment at 5.3 percent. Recent demographic changes and other structural changes in the labor market, as well as still-subdued wage growth, suggest that the natural rate could be below the current level of the unemployment rate. As has been discussed at some length, slack also exists on the labor force participation margin. Despite some cyclical improvement over the past year or so, the participation rate remains below what I believe to be its structural trend. The number of those out of the labor force but wanting a job, as well as other measures of marginally attached nonparticipants, still appears elevated relative to pre-recession norms, and the same is true of the share of employees working part time for economic reasons. That said, the labor market certainly continues to show improvement.

In contrast, incoming data so far have not provided grounds for reasonable confidence on the inflation leg of our dual mandate. The recent data suggest an underlying trend of price inflation of around 1¼ to 1½ percent. The 12-month change in core PCE prices, for example, is estimated to have been 1¼ percent in June, while the 12-month change in the Federal Reserve Bank of Dallas trimmed mean was 1½ percent in May. These rates are quite similar to the 1¼ percent average pace of core inflation over the past several years. As the effect of dollar appreciation on core import prices fades and resource utilization tightens further, I would expect that inflation will rise toward our 2 percent target. But, in view of the absence of any noticeable response of inflation to the reduction in resource slack over the past several years and the apparent flattening of the Phillips curve, the increase is likely to be quite gradual. Furthermore, the risks to the inflation forecast seem to be tilted to the downside. Although inflation expectations have been quite stable, there are some hints of some movement downward. This is true if you look at market-based inflation expectations; we're also seeing that in survey measures. As I mentioned earlier, we've seen a further leg down in crude oil prices and some increase in the trade-weighted dollar. There's also a fair risk that the downward pressure on inflation due to dollar appreciation and falling commodity prices could stretch beyond this year. This last concern follows from the foreign economic outlook.

China is slowing to an unknown degree and exerting a drag on both commodity prices and the growth prospects of commodity exporters. Although reported Chinese GDP growth was surprisingly robust in the second quarter following relatively weak first-quarter growth, the extent to which this may reflect a temporary run-up in the financial sector that is already reversing is unclear. Other indicators, such as commodity prices and economic growth in other East Asian economies, suggest a slowing in Chinese economic growth sufficient to exert a drag more globally. Meanwhile, economic difficulties in other important emerging markets, such as Brazil and Russia, are likely to continue for some time. A number of our close trade partners, such as Canada and Mexico, have also slowed.

The departure of Greece from the euro zone was avoided this month, so I see less risk as being associated with those scenarios. But, of course, negotiations on a third program are likely to be contentious, and Greek economic progress is likely to be limited over the next year. More broadly, uncertainty and weak internal demands seem likely to weigh on economic activity within the euro area, ensuring that monetary policy will stay extremely accommodative throughout the medium term, and that any contribution of Europe to global demand will remain pretty limited.

For all of those reasons, I expect foreign developments to continue to exert deflationary pressures. As the contrast between a U.S. economy on the verge of raising short-term rates and foreign economies in which monetary accommodation is likely to continue becomes increasingly apparent to market participants, the risks of further dollar appreciation may well increase. As markets adjust to relatively weak demand growth in both advanced and emerging economies, global deflationary pressures could be quite persistent. An economic outlook featuring moderate U.S. demand growth, still-present economic slack, persistently below-target inflation, and downside risks from abroad has important implications for monetary policy, which we will return to in tomorrow's meeting. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. My thanks to everyone for another interesting round of comments on the economic outlook. We've been at it a long time today, so I'm going to dispense with my usual summary. Today I'd just like to make a couple of comments of my own. For me, the data flow during the intermeeting period will be critical in deciding whether it's appropriate to raise the funds rate target range in September. So I thought I'd comment on what I'll be looking for in judging whether our two liftoff conditions have been met.

Starting with the labor market, in my view, conditions have clearly improved somewhat since earlier in the year when we set out as a condition for liftoff that we need to see further improvement in the labor market. Based on your comments, I think this view was pretty widely shared. The unemployment rate is down from 5.5 percent at the time of our March meeting to 5.3 percent in the June report, and the improvement in broader measures of labor utilization has been more noticeable, with U-6 down from 11 percent to 10½ percent now. The labor force participation rate is down a bit since the March meeting, and the employment-to-population ratio is unchanged, but the sideways movement of the employment-to-population ratio represents an improvement on the underlying demographic trend. So the staff estimates that the cyclical component of this ratio has narrowed modestly over the past four months. Payroll gains have averaged almost 200,000 per month in the four labor market reports we received since the March meeting. That's down considerably from the large gains seen, on average, over the previous 12 months, but the recent pace is nonetheless healthy. If it's maintained over the next few months, that's consistent with a further modest rise in labor utilization. Of course, not all of the labor market indicators are better. The JOLTS quits rate has moved sideways, and the hiring rate is actually down a bit relative to the data we had in hand back in March.

The ECI released in April suggested a pickup in wage growth. We've had a very interesting discussion around the table, and, of course, as President Rosengren noted, there are a lot of question marks about how to interpret this reading, in view of the fact that the pickup is concentrated in the Northeast. June's disappointing reading on average hourly earnings also calls into question whether any pickup in wage gains is actually under way. Even so, not every indicator needs to move in the right direction for us to reasonably say that overall conditions have improved. In that regard, the labor market conditions index, prepared by the Board's staff, has registered gains in recent months.

The real issue is not whether there has been some improvement since March, but rather whether there's been enough to justify liftoff. Personally, I think waiting until we've seen some further improvement is advisable, but I also believe that we could have sufficient evidence in hand by the time of the September meeting. For example, if monthly payroll gains in July and August come in around 200,000 or so, on average—perhaps accompanied by a rise in labor force participation—I would likely judge the cumulative improvement to be sufficient. Of course, stronger readings on average hourly earnings and the ECI would strengthen the case for me.

To be clear, I would not see such a limited amount of additional improvement as sufficient to return us to full employment. Like the staff and many of you, I believe that we still have a ways to go beyond what is likely to be accomplished in the next couple of months. We aren't that far off anymore, and, provided that the outlook for economic growth is sufficiently strong to support a continued tightening of the labor market, I wouldn't see a problem with starting the normalization process before all slack in the economy has been eliminated.

This economic growth requirement also bears on the other criterion we established for liftoff. So let me next turn to the conditions that will allow me to be reasonably confident that inflation will return to 2 percent over the next few years. Inflation data over the past few months have been in line with staff projections and my own expectations. As many of you noted, these data serve to confirm our assessment that the downward pressure on inflation stemming from the huge earlier fall in energy prices would prove to be temporary and indirectly support our assessment that the effects of past dollar appreciation will also fade. In the meantime, however, oil prices have fallen some more, leading the staff to revise down its forecast for inflation appreciably in the second half of the year and, especially, in the fourth quarter. Thus, we will face a communications challenge if we choose to lift off this year because headline PCE inflation on a 12-month basis is likely to remain close to zero until early 2016. And, as David showed, referencing core inflation may not be of much help either, as the staff projects the available readings on 12-month core PCE inflation to continue to run close to 1¼ percent through the December meeting.

At liftoff, we will need to make a good case for projecting that inflation is heading back to 2 percent. To me, that case largely rests on the basic nature of the inflation process. Based on the econometric evidence, I'm persuaded that something like the staff's inflation model provides a reasonable way to assess the outlook. According to this model, inflation should move back up to 2 percent over the medium term and in an environment of full employment, provided that longer-run inflation expectations remain anchored at their pre-crisis level and we don't experience further significant price shocks.

Most of the more complicated, DSGE, models maintained around the System make the same prediction and for essentially the same reasons. In these models, longer-run expectations serve as an attractor to which inflation converges in the absence of offsetting pressures. Of course, there's a lot we don't understand about the inflation process. All of these models may be wrong or incomplete in some important way, but that's true of any model. I think the appropriate standard to apply here is not that we have complete confidence in our models, but rather that our models do a reasonably good job of explaining the historical data and are not outperformed by some other forecasting procedure with a significantly different outlook. I believe that's the case.

Now, the staff's estimates suggest that current survey measures of longer-run inflation expectations are not, in fact, consistent with inflation converging not to 2 percent, but instead to a modestly lower level. If so, I would see that as roughly equivalent to saying that the natural rate of unemployment is somewhat lower than our current estimate, a possibility we always face due to the uncertain nature of our supply-side estimates. We deal with such uncertainty by continually reassessing our estimates of the natural rate and adjusting the stance of monetary policy accordingly. So if the staff's analysis of the survey evidence is correct, we'll find that bringing inflation back to 2 percent requires a stronger labor market than we now anticipate. As a result, I expect that, in response to incoming data, we'll find ourselves raising the federal funds rate somewhat more slowly over time than we now expect.

Like President Kocherlakota, a factor that I think is somewhat concerning is the decline over the past year in far-dated market-based measures of inflation compensation. This decline, which has been partially reversed in the past few months, calls into question the premise that longer-run inflation expectations have remained stable over the past seven years and thus the forecast that inflation is headed back to pre-crisis levels. Fortunately, staff analysis suggests that most of the decline probably represents a shift in liquidity and inflation risk premiums rather than an actual fall in expectations per se. Accordingly, these data won't lead me to raise serious questions about my inflation projection—particularly if they continue to drift back up toward their old level—but a renewed decline in inflation compensation would certainly give me pause.

The most important factor affecting my confidence will be the outlook for economic growth and the labor market. I'll need to see incoming data suggesting that real GDP growth will be enough above trend to complete the return to full employment even as interest rates rise. If so, I likely will be reasonably confident that resource utilization will prove sufficiently tight to bring inflation back to 2 percent over the medium run. But if the prospects for economic growth were to weaken in the near term, then I will be reluctant to begin the normalization process even if the cumulative improvement in labor market conditions has been appreciable.

As many of you noted, one recent favorable development for the outlook has been that the risks from the Greek debt situation have diminished, although Greece still faces a daunting path to debt sustainability. But I, like several others, will be watching developments in China carefully because I judge the downside risks to be significant.

I'll conclude by making two additional points about economic conditions and policy after the first increase in the funds rate. First, I judge that, under appropriate policy, the unemployment rate probably needs to fall below its longer-run natural rate temporarily. As I mentioned, like the staff, I judge that actual labor market slack currently exceeds the amount suggested by the unemployment gap. I therefore think that an expeditious return to maximum employment will likely require the unemployment rate to undershoot my estimate of its longer-run normal level for a time in order to foster the tight conditions needed to bring labor force participation and involuntary part-time employment back to their normal, cyclically adjusted levels. Alternatively stated, the effective short-run natural rate, in my view, is lower than my assessment of the longer-run normal unemployment rate. A period of somewhat tighter labor and product market conditions is also necessary to increase the likelihood that inflation will return to 2 percent at an acceptable pace. This is a point illustrated by some of the Tealbook B simulations.

Second, I'd note that it's likely to be quite a while before the Committee can be fully confident of its outlook that inflation will return to our 2 percent objective. Based on the staff forecast, we will have to wait until early 2016 for the data to confirm that the inflation effects of lower oil prices and a higher dollar were, indeed, completely transitory. It will take yet longer to confirm that inflation is moving back to 2 percent rather than just plateauing at around 1½ percent. With verification of our basic inflation forecast likely to emerge so gradually, the normalization process will probably need to proceed quite cautiously. We may also want to explore alternatives to the "reasonably confident" language in our public statements, both at liftoff and beyond, to better indicate the uncertainty that we face.

Let me stop there. We have a choice. Either we could ask Thomas to begin his monetary policy briefing now or we could quit and go have dinner. How about we do the following. I think we have plenty of time tomorrow morning. We'll start off at 9:00 a.m. Thomas will begin his monetary policy briefing then.

MR. KOCHERLAKOTA. You want to be perfectly fresh for something so deep and sophisticated.

MR. WILLIAMS. Right. Absolutely. Thomas, we don't want to shortchange you at all.

VICE CHAIRMAN DUDLEY. We're doing this for you, Thomas. [Laughter]

CHAIR YELLEN. We will start off giving Thomas our full attention at 9:00 a.m. In the meantime, let's go have a drink. [Laughter]

[Meeting recessed]

July 29 Session

CHAIR YELLEN. Good morning, everybody. This morning we're going to start off with Thomas's briefing about monetary policy alternatives.

MR. LAUBACH.[8] Thank you, Madam Chair. I will be referring to the handout labeled "Material for Briefing on Monetary Policy Alternatives."

Your first exhibit reviews market participants' monetary policy expectations and their economic conditionality. The top two panels plot the probability distributions for the timing of liftoff derived from federal funds rate futures quotes—on the left—and responses to the Desk's Survey of Primary Dealers—on the right—that Simon also showed in his briefing. Both show very low odds of policy firming at this meeting. As Simon noted, some care needs to be taken in deriving probabilities from federal funds futures quotes to control for market participants' assumptions about where in the target range the effective federal funds rate will trade. Under the assumption that it will trade in the middle of the range, the odds of liftoff in September based on federal funds futures are 33 percent; they are 40 percent, on average, in the dealer survey. Both show lower, but still significant, probabilities that policy normalization will begin in December, and, according to federal funds futures, there is roughly a 25 percent chance that it might begin only in March of next year or later. As you can see from the dashed lines, investors' views have changed little since the time of the June FOMC meeting.

The next three panels shed some light on investors' views about the medium-term path for the federal funds rate as well as the economic forecasts that underlie these policy expectations. As shown on the left, almost three-quarters of the primary dealers are anticipating that core PCE inflation during 2016 will be at or very close to 2 percent. The expectation of the median respondent, shown by the blue vertical line, is close to that in the June SEP, shown by the black vertical line. At the same time, as illustrated on the right, most dealers are anticipating that, by the end of next year, the unemployment rate will have fallen more noticeably below their estimates of the longer-run unemployment rate than was true for the SEP median.

The dots in the bottom-left panel show the paths of the federal funds rate associated with these economic projections. The dealers' expectation of a substantial tightening in resource utilization and of core inflation returning to close to 2 percent in 2016 seems consistent with the fact that most of them expect policy normalization to begin in September. But although the median dealer expects labor markets to tighten somewhat faster than the median June SEP respondent, the median dealer's projection of the federal funds rate is identical to the median SEP dot at the end of 2016 and slightly lower at the end of 2017. This slightly lower path than in the SEP might reflect an expectation of a more accommodative policy stance or, alternatively, a lower path of the equilibrium real interest rate. As shown in the lower-right panel,

[8] The materials used by Mr. Laubach are appended to this transcript (appendix 8).

the primary dealers assign greater-than-even odds to the pace of tightening in the first year after liftoff being 100 basis points or less, and these expectations are essentially unchanged from June. Averaging across the Desk's two surveys, the pace of tightening in the first two years following liftoff is about 100 basis points per year, conditioned on not returning to the zero lower bound.

Returning to the lower-left panel, although the dealer survey traces an expected path for the federal funds rate not too different from the June SEP, the path derived from OIS quotes—the red line—runs substantially lower. In part, this difference might reflect term premiums associated with the benefits of holding these nominal assets in states in which the federal funds rate remains very low. While decomposing these risk-neutral expectations into term premiums and risk-adjusted expectations is challenging—especially with short-term rates at their effective lower bound—staff estimates suggest that only a modest share of the discrepancy between the OIS path and the other two paths can be explained by negative term premiums over the first two years. Thus, the marginal investors in this market seem to anticipate a yet more gradual pace of policy rate increases. In sum, while market participants seem to be prepared for the possibility of policy tightening at your next meeting, they expect a lower trajectory of the federal funds rate over subsequent years than is embedded in the SEP median, after controlling for differences in their economic outlook to the extent we can.

Turning to the draft statements for this meeting, the three alternatives offer a range of characterizations of current and prospective progress toward the Committee's economic objectives and of the likelihood of policy tightening (or further policy tightening) at upcoming FOMC meetings. As indicated in the bullets in the top panel of your second exhibit, alternative B is intended to convey the Committee's assessment that the economy has been evolving in such a way that it could become appropriate to raise the target range for the federal funds rate in September, provided that the Committee sees additional progress toward maximum employment and becomes reasonably confident that inflation will move back to 2 percent over the medium term. However, the language of the statement would express sufficient dependence on the incoming data to avoid deliberately shifting the current probability distribution of the timing of liftoff toward September and to retain the option to defer the start of normalization.

The message of paragraph 1 would be that the economy is again expanding moderately, with solid job gains and declining unemployment providing evidence of continued improvement in the labor market—one of your criteria for commencing normalization. To underscore the Committee's view of the importance of the cumulative progress in labor market conditions, paragraph 1 would note that "underutilization of labor resources has diminished since early this year." Paragraph 3 would provide an additional indication that the Committee sees labor market conditions as having moved closer to those that would be consistent with policy normalization, saying that the Committee needs to see "some" further improvement in the labor market.

Alternative B would leave largely unchanged the Committee's previously stated assessment of current and expected inflation developments and would repeat that it still needs to become reasonably confident that inflation will move back to 2 percent over the medium term. However, the draft of paragraph 1 suggests dropping the reference to energy prices having stabilized. The change would recognize that crude oil prices have fallen back a bit over the intermeeting period, and it could be read as suggesting that the drag on headline inflation from energy prices might not dissipate as quickly as previously anticipated.

As I indicated earlier, investors currently view September as the most likely meeting at which policy normalization will begin, and most dealers expect no material change to the forward guidance in today's postmeeting statement. That would seem to imply that a draft statement like alternative B would not elicit a significant market reaction or shift the probabilities of the timing of the first increase in the federal funds rate noticeably. However, as we noted in Tealbook B, if market participants interpret the insertion of "some" in paragraph 3 as boosting the odds of a decision to raise the target range for the federal funds rate in September, then interest rates might rise, equity prices could fall, and the dollar would likely appreciate.

As noted in the middle panel, the draft statement for alternative A would provide an assessment of labor market conditions and inflation that would indicate that the Committee does not anticipate seeing, for some time, conditions that would warrant the beginning of policy normalization. Such a statement would likely shift the distribution of expectations regarding the date of policy tightening noticeably later. Paragraph 2 of alternative A would report that "in light of economic and financial developments abroad, the Committee sees the risks to the outlook for economic activity and the labor market as tilted to the downside." And it would indicate the Committee's concern that "inflation could run substantially below the 2 percent objective for a protracted period." This concern would be emphasized by the introduction of a stronger inflation criterion for policy normalization in paragraph 3 and the addition of a commitment to use all of the Committee's tools to return inflation to 2 percent within one to two years "if inflation does not begin to rise soon."

The draft for alternative C—summarized in the lower panel—would present an assessment of economic conditions and the outlook consistent with a decision to raise the target range for the federal funds rate. More important, it introduces for your consideration a number of other changes that you might make when you announce the start of policy normalization. First, paragraph 2 would modify the reference to the policy assumption underlying the Committee's outlook to indicate that it expects to continue to make "appropriate adjustments in the stance of monetary policy." Paragraph 3 would set the stage for additional increases in the target range for the federal funds rate and would add a sentence emphasizing the Committee's view that, "even after this adjustment, the stance of policy remains highly accommodative and will continue to support a strong economy." The new sentence would link the Committee's assessment of the overall stance of policy directly to its principal policy tool—the funds rate. In the current statement, that assessment only appears at the end

> of paragraph 4, in which the Committee states that keeping the balance sheet sizable "should help maintain accommodative financial conditions."
>
> Alternative C also provides several options for updating the forward guidance concerning future adjustments of the federal funds rate after normalization begins. In paragraph 4, you might choose to follow the language of the Committee's Statement on Longer-Run Goals and Monetary Policy Strategy and communicate that the Committee's decisions will depend on its assessment of realized and expected "deviations from its objectives." However, if you are concerned that the reference to "deviations" would suggest that the Committee has a numerical definition of labor market conditions consistent with maximum employment, you may want to say more broadly that you will assess "economic conditions relative to" your objectives. In either case, the draft offers an option of retaining the current guidance that the Committee "will take a balanced approach" to pursuing its objectives. And, finally, while paragraph 4 would repeat the Committee's expectation that "economic conditions may, for some time, warrant keeping the target federal funds rate below levels the Committee views as normal in the longer run," it would also communicate that the Committee's assessment might change as economic conditions evolve by stating that the actual path for the target range "will depend on the incoming data."
>
> Thank you, Madam Chair. That concludes my prepared remarks.

CHAIR YELLEN. Thank you very much. To begin our go-round, I'd like to say just a few words about our policy decision and, in particular, our communications with the public.

Economic conditions appear to be evolving in a manner that will likely make it appropriate to raise the target range for the federal funds rate sometime this year. That was the message coming from the June SEP, and, based on what I heard during the economic go-round, I don't believe that view has materially changed. As was evident from my own remarks yesterday as well as from my own recent public communications, I believe that liftoff at our next meeting, in September, is a distinct possibility. This decision, however, remains dependent on the data and their implications for the outlook. Hence, in our communications, we face the challenge of striking the right balance between keeping our options open, on the one hand, and not taking markets completely by surprise, on the other. Depending on how the data evolve and, along with them, both our thinking and that of the markets, achieving this balance may be tricky, and our public communications between now and liftoff will be under enormous scrutiny.

In considering this challenge, I went back and reviewed our policy on external communications, and I'm pleased that it offers some clear and useful guidance for us. In particular, the first principle of our policy is that every Committee participant has an obligation to enhance the public's understanding of monetary policy, including its rationale. So I would ask you to try to keep this principle in mind at all times, but especially now, when there's such tremendous focus on the timing of liftoff. We have explicitly adopted a data-dependent approach to policy, and we're not yet in a position to determine when we will raise rates.

Opining in public on the exact timing of the first move, in my own view, not only detracts from our consensus-driven deliberative process, but also can easily confuse markets and the general public, adding to volatility and, ultimately, diminishing the effectiveness and credibility of our policy. In addition, the more we talk about the precise timing of the first move, the more we stoke the media's attention on one particular change in interest rates. To be sure, the initial increase in the federal funds rate will be noteworthy, as it will mark the end of an extraordinary period of near-zero rates. But, based on the economics, liftoff arguably contains more symbolism than substance. As I've emphasized in my public statements, it is the entire expected path of the policy rate that matters for financial conditions in the economy, not just the initial increase. And the real issue we will face is how cautiously we raise rates after liftoff to ensure that the economy can really absorb higher interest rates, and that inflation is truly heading back to 2 percent.

Of course, our communications guidelines affirm that participants are free to present their own views, but it's critical that this be done in a way that clearly distinguishes one's individual view from the Committee's agreed-upon policy stance. I would note that our policy explicitly prohibits making a prediction about Committee action in advance of the Committee announcement of its decision. So my suggestion for all of us is to refrain from speculating about the time of liftoff. One useful formulation when asked about liftoff is to say that no decisions have been made, the Committee remains focused on the data, and you look forward to discussing this decision with your colleagues at the next FOMC meeting. If pressed, three additional points might be useful. First, this can be seen from the June SEP. If economic conditions evolve as expected, most FOMC participants view a first move sometime this year as likely. Second, even after the initial increase, policy will remain accommodative to support progress toward our dual objectives. And, finally, as I just noted, it is the overall path of the policy rate that is of greatest import for the economy and not simply the first move.

Let me end by noting that it's conceivable to me that some type of communication may be warranted if we find ourselves in a situation in which the Committee appears inclined to raise the federal funds rate at our next meeting but markets, in the run-up, appear to be judging it as unlikely. In that case, my inclination might be to make some widely available public comments through some sort of event or interview to try to better align public expectations for our near-term deliberations. But I want to assure you that, before doing this, I would certainly consult with you to hear your thoughts and advice.

Let me stop there, begin our go-round, and remind you that, in addition to your thoughts on today's policy decision, it would be very useful if you could also provide your views regarding the suitability of alternative C for a meeting at which we first decide to raise the target range for the federal funds rate. We're going to begin with President Kocherlakota.

MR. KOCHERLAKOTA. Thank you, Madam Chair. Before I begin, I was wondering if I might have an opportunity to ask Thomas a question.

CHAIR YELLEN. Oh, I'm sorry. I apologize. I should have allowed questions for Thomas. Let's do that.

MR. KOCHERLAKOTA. Thanks. I have a question about the addition of the word "some" in alternative B, paragraph 3. I wasn't sure what that was supposed to connote beyond what was already in paragraph 1. Paragraph 1 describes that labor markets have improved. We're getting closer, presumably, to whatever represents maximum employment because of that progress. So I'm not sure what the word "some" was supposed to connote beyond what was already in paragraph 1.

MR. LAUBACH. My personal thinking is that it's not unambiguous that "further improvement in the labor market" has a fixed starting point. It could be simply measured in terms of further improvement from wherever you are today. I think what the "some" signifies is simply that there is, in fact, implicit in this a fixed starting point, which was when the Committee first adopted this language, and that some of that distance has been traveled and only some of it remains. That's what it's intended to clarify.

CHAIR YELLEN. Are there further questions for Thomas before we begin our go-round? [No response] President Kocherlakota.

MR. KOCHERLAKOTA. Thank you. Madam Chair, with the exception of a few months in late 2011 and early 2012, core PCE inflation has been below our adopted target of 2 percent for nearly seven years. The outlook in Tealbook A is that it will not return to target until the next decade. I do not see this outcome as consistent with our commitment to keep inflation at 2 percent over the longer run. How can we do better?

The staff provides a clear answer to this question in the excellent optimal control simulations in Tealbook B, in which they put zero weight on unemployment falling below the natural rate. Basically, we can facilitate a more rapid return of inflation to target if we are not averse to living in an America in which the unemployment rate is below 5 percent for several years. Now, for those of us in the Ninth District, we can tell you it's not so bad to have unemployment below 5 percent. We live with it all the time. So if we're willing to make policy choices that give rise to unemployment rates in the 4s for an extended period of time, then those policy choices will push inflation back to target in a much more timely fashion.

Now, the optimal control exercises also indicate that we could obtain those outcomes, even if we initiate liftoff later this year rather than waiting longer, as long as we raise the federal funds rate very slowly, by about 10 basis points per quarter. But I'm not convinced this "go early and super slowly" approach is the best one. A key part of what makes these policies work in the simulations is, the agents in the model know that the FOMC is not averse to having unemployment below 5 percent. In the real world, the public doesn't know that, and I don't believe that lifting off in, say, September would signal that clearly. From this communications point of view, we would be much better off deferring liftoff until, say, the latter portion of next year and then raising the federal funds rate more rapidly than 10 basis points per quarter. As the footnotes in Tealbook B suggest, we would get pretty similar inflation and unemployment outcomes by doing that—as long as assumptions in the model are met, of course.

All of this is based on the modal outlook. I talked yesterday about some of the downside risks—possibly adverse international outcomes and a further downward slide in inflation expectations. I thought Governor Brainard's comments on the dollar were ones that really sharpen the points I was attempting to make about international risks. Especially in light of the constraints imposed by the zero lower bound, these risks also support deferring liftoff until we have a stronger inflation outlook. I am sure that some of you, perhaps many of you, are undoubtedly concerned about other risks: a possibility that the Phillips curve may prove to be considerably steeper than what the staff has modeled, or that risks to financial stability arise from low interest rates. These are absolutely legitimate concerns. The Committee meets eight times per year and gets plenty of advance warning for these particular outcomes. We'll hear about and see inflationary pressures through the behavior of inflation itself and through our intelligence-gathering efforts. The QS report, through the diligent work of our staff, will reveal risks to financial stability. If we feel that the QS report is not designed to elicit the kinds of risks to financial stability that we're concerned about, we should be letting our staff know what other information they should, in fact, be including in that report.

Importantly, not only do we get the information about these risks when they actually materialize, but this Committee also has the tools to deal with these risks, should they transpire. It can increase rates more rapidly; it can halt reinvestments sooner; and it can, if needed, sell assets. This is in contrast with the downward risks, concerning which we're so constrained by the zero lower bound.

Madam Chair, I urge the Committee to be willing to pursue our 2 percent inflation objective with urgency, even if that pursuit results in an unemployment rate under 5 percent for an extended period of time. So I recommend alternative A.

While I'm recommending alternative A, I do have a comment about alternative B, which follows up on the question I asked Thomas. I would suggest not including the word "some" in paragraph 3. I think that a good discipline on all communication is, we should be adding words if we have a very specific message we want to deliver. I'm not sure what message the Committee is attempting to deliver. If the Committee is attempting to deliver the message that September is very "live" in its thinking, the route you were describing whereby you were going to have a public set of remarks during the intermeeting period seemed like a much more useful way to proceed. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. I support alternative B. Between now and the September meeting, we will have two employment reports and further evidence on whether we are experiencing wage and price acceleration consistent with returning PCE inflation to 2 percent in the medium term. While I'm reasonably confident that labor markets will continue to improve, particularly in light of the apparent waning of several important geopolitical concerns, I need to see more data to determine whether we are returning to our 2 percent inflation target within a reasonable horizon. Although the oil price decline and dollar appreciation since the end of last year are likely to be attenuating, recent movements in oil prices and the exchange rate indicate that these forces may be continuing to influence pricing developments. The Tealbook has a very gradual return to our inflation target. I'd like to see a more rapid return, and, currently, that pace remains uncertain.

My own view is that, in September, core PCE inflation may be as likely to fall further as to rise—not probabilities consistent with reasonable confidence of a return to target. The economy is approaching a point at which the Committee will confront a difficult decision at each meeting. If labor markets continue to improve and the wage and price data show further evidence of inflation returning to target, I could be persuaded that September was the time for liftoff. However, I can easily imagine that wage and price data will not be improving as hoped, and that a later liftoff would be appropriate. The statement is data dependent, and I believe we should be open minded to reacting only when the data have confirmed the conditions we have set out in our statement.

CHAIR YELLEN. Thank you. President Williams.

MR. WILLIAMS. Thank you, Madam Chair. I support alternative B as written, and I agree with President Rosengren about the use of the word "some." I think it does, as Thomas explained, capture the fact that we've made significant progress in terms of our employment mandate.

Economic conditions look increasingly favorable. Most important, the labor market has improved steadily this year. Although we may not be quite there yet, we are finally closing in on full employment. And, while inflation remains low, the most recent data are consistent with a gradual return to 2 percent. Of course, with oil prices dropping again and the dollar having edged up some, the return to 2 percent may be delayed a bit longer, but the experience over the past year confirms that those effects will be transitory. Between now and our next meeting, a deluge of data on wages, prices, spending, and labor market conditions will be released, and this counsels a bit more patience. But, barring any major surprises, I anticipate that it will be appropriate to raise the target funds rate at our September meeting.

Looking ahead to that time, I support the overall approach taken in alternative C. It provides a smooth transition from past statements, which focus on the conditions for liftoff, to future statements, which will focus on the likely path of policy normalization. Again, I agree with President Rosengren. I see this statement, maybe, as the bridge between the past and future statements in which we will be trying to describe the future policy decisions. But this statement is a transition statement to get us from one point to the next. But I agree with your point about the need for talking about future policy normalization.

In that regard, I have two comments on how we should frame our policy decisions in this post-liftoff era, thinking ahead to the statements of the future once we've raised rates. First, when we're nipping at the heels of full employment, we'll need to get away from language that implies that we need to see further improvement in the labor market for rate hikes. For example, it could well be appropriate in the future to raise rates even if the labor market softens a bit between meetings, assuming I'm talking about a situation in which the unemployment rate is around 5 percent. Instead, future statement language should focus more, I think, on the overall strength of the labor market—that is, the level, rather than the change. I guess that's just a sign of the success I'm foreseeing in terms of our employment mandate over the rest of this year.

Second, I'm concerned about how the bracketed "balanced approach" language in paragraph 4 of alternative C could be interpreted in a rising rate environment. Specifically, this language may pose communication risks when inflation is below target and the unemployment rate is at or below the perceived longer-run natural rate of unemployment, a scenario described by the Chair in her comments yesterday, and a characterization of my own forecast. Basically, it's a situation in which we are appropriately pushing unemployment below 5 percent—picking up on the comments of President Kocherlakota, too—in order to bring inflation back to 2 percent, but inflation is still too low.

As noted in our consensus statement, "balanced approach" refers to situations in which we're trading off conflicting goals. In the circumstances I'm considering here, it's unclear what we are balancing or trading off. Does a low unemployment rate on its own require a restrictive policy adjustment that would delay the attainment of our 2 percent inflation objective? This issue is nicely illustrated by the Tealbook optimal control simulation using asymmetric weights on positive and negative unemployment gaps, a simulation that features a more accommodative policy stance and faster attainment of the inflation goal than implied by the standard symmetric quadratic loss function, as President Kocherlakota just mentioned.

Economic theory does not provide clear guidance on this issue. Unquestionably, the unemployment rate can be too low from an efficiency point of view. However, the longer-run natural rate of unemployment—the unemployment rate consistent with constant inflation—can and likely does differ from the efficient, socially desirable level.

In the longer run, our inflation mandate implies that this tension must be resolved in favor of the natural rate of unemployment, and our consensus statement makes that point. But this doesn't answer the shorter-run question of how to weigh deviations from our longer-run employment goal in our policy deliberations. As President Kocherlakota has pointed out in previous meetings and again today, we as a Committee haven't really discussed this issue at any length, nor have we come to any definitive conclusion.

Now, to be clear, I'm not advocating a particular position on the current level of the efficient level of unemployment or the short-term natural rate of unemployment that the Chair mentioned yesterday relative to the longer-run natural rate. I'm just highlighting an important issue in terms of framing our policy communications because of the uncertainty about how best to think about this. Because of the high degree of uncertainty associated with the measures of full employment that we're trying to reach, I am wary of including the "balanced approach" language in the way that is laid out in alternative C. Astute observers will take notice and may raise sensitive and, ultimately, distracting questions about whether perceived excess employment, which President Kocherlakota says seems to be quite pleasant, is resulting in a tighter setting for monetary policy. To avoid the potential for such an unforced error, in the parlance of tennis, I prefer the language that emphasizes "economic conditions relative to" rather than the "deviations from," and prefer not to include the bracketed "balanced approach" language in our future statements as described in alternative C. Thank you.

CHAIR YELLEN. Thank you. President Mester.

MS. MESTER. Thank you, Madam Chair. In my view, the incoming data continue to indicate that the economy can support an increase of 25 basis points in the federal funds rate from today's very low, essentially zero, level. Economic growth has strengthened, the labor market has improved notably over the past year, and I expect that to continue. Continued economic expansion and improvements in the labor market, the stability of longer-term inflation expectations, and recent stabilization in some of the inflation measures make me reasonably confident that inflation will move back to our 2 percent objective over the medium run. I do believe we need to be data dependent. But, barring any significant negative surprises, I believe the conditions we've indicated for liftoff will have been met by September. What's important for me today is that our statement not preclude September as an option for liftoff.

Personally, I probably would have preferred that we move further toward laying the foundation for the rationale for liftoff. As we discussed yesterday, conveying the points that monetary policy needs to be forward looking, and that our inflation models project inflation to return to 2 percent over the medium run even if the current measures of inflation are underrunning 2 percent, is going to be key to that rationale. Nonetheless, I believe the language in alternative B keeps September alive, so I support it.

I appreciate that paragraph 1 gives some indication of the longer-term gains we've seen in the labor market, rather than focusing solely on the developments over the intermeeting period. In paragraph 3, I support adding the word "some" to the liftoff conditions for the labor market. I think that's appropriate because it acknowledges the progress we've seen, and I agree with Thomas's explanation of the value of adding that word.

With liftoff getting near, I believe it's appropriate that we consider the language we'll want to use at the time, and I'm glad the Chair has asked us to comment specifically on alternative C language. I do think this statement will also serve as a liftoff statement. Paragraph 1 provides a longer-term perspective on economic developments, which is appropriate in our statement, not only at liftoff but also beyond. As paragraph 3 does, it is important to remind the public that, even after this initial increase in the funds rate, policy will remain highly accommodative and supportive of the economy. I like not only the addition of "some" to paragraph 3 in alternative B, as I've already said, but also the evolution of the statement in alternative C.

In paragraph 4 of alternative C, I appreciate the inclusion of a language choice in this version of the statement. I have a strong preference for saying that we'll assess "economic conditions relative to" our objectives of maximum employment and 2 percent inflation, rather than "deviations from," because I think one of the issues the Committee has struggled with over the past few years is how to explain that, while we do have a numerical objective for our price-stability objective, we do not have one for our maximum-employment objective. I believe speaking about deviations might be misconstrued as implying that we have a numerical goal, and this is the explanation that Thomas gave. My initial thought about our saying in paragraph 4 that we will take a balanced approach to pursuing objectives was that it was okay because this language is used in our Longer-Run Goals and Monetary Policy Strategy statement. But I want to think about some of the issues that President Williams raised with respect to using this in this statement at this particular time. So I need to consider that further. I agree that including language that our path is anticipated to be gradual is appropriate. We've been saying that, but I also think that adding the language that it's data dependent would be helpful.

Finally, because of the scrutiny any change to our statement gets, there will be few times when we can make significant changes to the structure of the statement without risking something being read into it. Liftoff affords us the opportunity, because the focus is going to be solely on our action. So this might be a time to return to the structure of making the policy decision the first paragraph of the statement, as we did before the crisis. Or, as they say in journalism, we might take the opportunity to stop burying the lede. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Lockhart.

MR. LOCKHART. Thank you, Madam Chair. I support the policy decision in alternative B. I also support the alternative B statement as presented.

I see paragraph 1 as a good characterization of the state of the economy. I like the effect of the phrase "since early this year" in the sentence on underutilization of labor resources. I think it appropriately widens the aperture in discussing progress and conveys that the Committee is considering and giving weight to accumulated gains, and that it will not be unduly influenced by one month's data, if they are disappointing. I also favor the insertion of the word "some" in paragraph 3. I hope this small change in wording will be seen as a slight foreshadowing of a possible move in September and therefore serve to prepare markets without conveying any sense that liftoff in September is a certainty. Although these messages are subtle, I think the statement positions the policy question appropriately.

Regarding alternative C as a template for a liftoff statement, I can envision wording similar to that in paragraphs 1 and 2 working well at the time of liftoff. I'll make some small points, however, about paragraphs 3 through 5. Yesterday, I was part of the group that explicitly or implicitly argued for putting balance sheet policy in the background relative to interest rate policy. Thomas earlier pointed out that the added sentence in paragraph 3 is intended to link the overall stance of policy with the funds rate as the principal policy tool. To be consistent with my remarks yesterday, I have to agree with this approach. I'll just point out, however, that we may not have totally wrestled to the ground the question of whether the overall stance of policy includes balance sheet policy, and therefore the added sentence might come later.

In the same vein, the "balanced approach" wording in paragraph 4, which, at present, I think should stay in—I'm with President Mester in wanting to consider President Williams's points earlier—and which used to be in the now-eliminated paragraph 6, could be made about an overall approach to setting policy that includes balance sheet policy. So I raise these points as minor considerations. On the bracketed choice in paragraph 4, I prefer the broader meaning of "economic conditions relative to" as opposed to the phrase "deviations from."

To summarize, I think alternative C is workable for liftoff purposes, with some consideration of structure and sequencing in paragraphs 3, 4, and 5. Thank you, Madam Chair.

CHAIR YELLEN. Thank you very much. President Evans.

MR. EVANS. Thank you, Madam Chair. First, let me say I share the concerns raised by President Kocherlakota. Until wages start rising, consistent with employment being—however you want to describe it—excessively high and inflation at or above 2 percent, I think there's a chance the natural rate is less than 5 percent. So that's worth watching.

I support alternative B. I don't prefer including the qualifier "some" in paragraph 3. I don't believe it's necessary, and I think the economic updates in paragraph 1 should be sufficient to capture the evolving fundamentals for our policy decision. But, having said that, I can certainly live with including "some" in the statement.

With regard to the question of whether alternative C contains the appropriate language for when the time does come to raise the target rate, I don't have any major problems with that statement, either. I would prefer a couple of small changes—namely, maintaining the commentary in paragraph 2 that the Committee will be monitoring inflation developments closely. I think that would be important. I also would include the language in paragraph 4 regarding taking a balanced approach to our policy objectives.

Of course, my comments are premised on the assumption that we actually have reasonable confidence that inflation will be getting back up to 2 percent within a reasonable period of time when we make this policy move. I could not support the language in the alternative if we were beginning to normalize policy before we were, in fact, reasonably confident of such an outcome. For me, I'm still skeptical that the data will support reasonable confidence in this inflation outlook by the end of the year, if then.

I thought it was interesting that, in the commentary yesterday on the Phillips curve, a number of people mentioned they had—however you want to describe it—confidence or faith that the Phillips curve would reassert itself in terms of inflationary dynamics. So I went back and revisited what the Phillips curve, as it's usually employed in the Tealbook, looks like. On the right side of the equation, you have a number of variables. One of them is inflation expectations. Another is some transitory *X* variables, which, in this case, are going to play the part of oil prices, energy, the dollar—that type of thing. They're transitory and should be waning. Then, of course, there's resource slack. The resource slack isn't really contributing very much there one way or another, because we're close to the natural rate of unemploymenr, and it's not helping us get to 2 percent until we overshoot. Even then, it's not going to help us very much, because the argument itself will be very small. For anybody who's done empirical work, it's just really hard to get any noticeable slope on that, so the actual effect is pretty small. People might remember times when it was larger, but, more recently, it's very hard to get results like those. So most of the heavy lifting to get us to 2 percent is going to depend on this inflation expectations term and the waning contributions of the transitory factors, the *X* variables. It's certainly reasonable that the contributions of the *X* variables are going to wane, but then that gets us to inflation expectations. I don't see how you get anything above 1.8 to 2 percent inflation in this kind of environment. The Tealbook has the—whatever the term is—reference rate for longer-term inflation, which is not exactly longer-term inflation expectations, at about 1.8 percent. I hope it's moving up.

I understand the empirical reasons why we have longer-term inflation expectations in that equation. It fits better, but the theory is really much more about a shorter-term kind of inflation expectation. You can understand why that would provide some uplift, the so-called gravitational pull about which we all say, "If it's moving from the two- to four-year variety of inflation up to the longer term, then that would get us up there."

It's just really hard to see any risk of inflation being 2 percent or higher in this type of formulation, even if I have pretty good faith in the Phillips curve, unless I foresee pretty substantial overshooting on the resource side. So I think there's continued risk here that, when we say our objective is 2 percent, we start our normalization process, and we end up with something that looks like the Tealbook inflation projection, it's going to be interpreted as indicating that 2 percent looks a lot like a ceiling. I don't believe we're going to get above 2 percent. That's one of the big risks that I really see with all of this.

I continue to be very nervous about that. But, having said that, I certainly support alternative B today. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Harker.

MR. HARKER. Thank you, Madam Chair. Although I'm not in favor of adjusting the funds rate at this meeting, both the underlying strength of the economy and my reasonably high level of confidence that inflation will return to target over the medium term incline me toward the view, conditioned on the data we will receive over the next several weeks, that September will be the correct time to lift off. I also favor a gradual path of policy firming, which I believe will be made more likely by an earlier liftoff. In the current economic environment, a gradual tightening of policy will maintain an accommodative policy stance for some time, which is appropriate in light of what has transpired over the past eight years. While I agree that our statement language should emphasize that policy will remain data dependent, we should also recognize, to a greater degree, that economic conditions are now close to being consistent with our dual mandate. To that end, I would suggest replacing the fourth sentence of paragraph 1 in alternative B with the fourth sentence of paragraph 1 in alternative C, and that would communicate that sentiment much better.

To me, alternative C also represents reasonable statement language for when we decide to liftoff. It emphasizes two key elements that are recognized as necessary for liftoff—the substantial progress we've made on the economic front and our increased confidence that inflation is returning to target. Including these key elements will send a message that the Committee believes the economy is on solid footing and will underscore the confidence the Committee has in continued good economic outcomes. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President George.

MS. GEORGE. Thank you, Madam Chair. I have no objection to alternative B today from the standpoint that its posture keeps future meetings open for a decision to raise rates. Although liftoff is not on the table for this meeting, I could have supported it today, as economic data received since our June meeting generally confirm that economic growth resumed after a weak first quarter, with further improvement in labor markets and low and stable inflation.

Assuming no big surprises in tomorrow's GDP release, the current expansion is the fifth longest within the 33 U.S. business cycles documented by the NBER. Not only are policy prescriptions flashing their support of higher rates, but also the Tealbook r^* measure remains more than 1 percentage point above the actual real federal funds rate. Looking back at the past 10 years of Tealbook B and Bluebooks, this is among the most accommodative settings of policy over this period. Perhaps some of this was warranted, as policy was constrained by the effective lower bound. But as conditions continue to normalize and this r^* measure rises, the additional accommodation provided by the current stance of policy should be factored into our liftoff decision.

In terms of the suitability of alternative C for a meeting at which the Committee decides to raise the federal funds rate, I generally support the language shown, although I would keep the language focused on data dependence at that time and avoid references to deviations from our objectives. Thank you.

CHAIR YELLEN. Thank you. President Lacker.

MR. LACKER. Thank you, Madam Chair. At the April meeting, I made the case that conditions warranted higher interest rates. That case was based on the sustained improvement in real activity we'd seen—strong consumer spending growth and labor market conditions—and the sense that forces damping inflation readings and depressing Q1 economic growth were temporary and likely to pass soon. The forward guidance we had in place at the time, however, precluded such a move, and the economic consequences of lifting off just a meeting or two later seemed small. That basic assessment of economic conditions didn't change for me in June, and, in fact, the data confirmed that transitory factors were dissipating. I thought a strong case could be made for raising rates then as well, although, again, the consequences of waiting seemed small.

As data have come in consistent with our outlook, the case for raising rates has been getting even stronger, making me less and less comfortable with further delay. Lifting off at a meeting without a prescheduled press conference would be a bit awkward, however, because markets clearly do not expect a move except under unusual circumstances, despite our statements to the contrary. But absent a significant unexpected turn in the data between now and our September meeting, I would oppose any further delay. For today, I can support alternative B. By softening the requirement for further labor market improvements, it prepares us for a September liftoff, which I think will be appropriate.

When we do lift off in September, I believe the language in alternative C is, for the most part, appropriate. The one exception to this is in paragraph 3, in which I would delete the last clause of the last sentence, which says "and will continue to support a strong economy." At best, this clause is redundant, because we begin by saying "policy remains highly accommodative." But I actually think it's a bit worse than redundant, because it's unbalanced relative to our objectives. By singling out the real side, it risks reinforcing unrealistic expectations about the real effects of monetary policy in current circumstances. With that deletion and without a marked change in the data flow, alternative C will work well in September. In fact, it would work well today, and it would have worked well in June, too.

Finally, let me say a word about intermeeting data. I appreciate that we are and ought to be data dependent, but I don't think we should insist that the last smidgen of data be an uptick. We should be mindful of the frequency with which one month's data reflect noise rather than signal. Madam Chair, you've emphasized the entire path of the federal funds rate. That perspective suggests a focus on where economic conditions are likely to be a year or two down the road and what rate would be appropriate then, rather than the last month's smidgen of data. Similarly, this perspective suggests evaluating current economic conditions in the context of how far we've come over the past six and a half years since we reduced rates to zero. In view of the millions of jobs the economy has added since 2009, it would seem perverse to delay liftoff if August payrolls fell short of expectations by, say, 100,000. The intermeeting data should be broadly consistent with our assessment of economic trends, and the record that we've seen that's documented those economic trends has included occasional hiccups in the data. I think we need to be mindful of that as we approach September. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. First Vice President Holcomb.

MS. HOLCOMB. Thank you, Madam Chair. I support alternative B, even though its language could go further in acknowledging the progress that's been made toward meeting the criteria for liftoff. Over the past six weeks, we have had confirmation of a bounceback from the economy's first-quarter stall, we have had a tentative resolution of some of the international uncertainty with which we were concerned, and we have had direct evidence of further progress toward full employment. Confirmation that the economy is growing at an above-trend rate should give us increased confidence that inflation is on an upward track. But we also have the direct evidence from the inflation rates we've seen since oil prices bottomed in January. As mentioned yesterday, these include headline CPI and PCE, core CPI and PCE, and trimmed mean PCE.

Our outlooks for GDP growth, the unemployment rate, and inflation over the next year or two are more optimistic than those in the Tealbook. Federal Reserve Bank of Dallas staff economic forecasts are closer to the June SEP central tendency than they are to the latest Tealbook baseline. Anticipating stronger GDP growth, a lower path for the unemployment rate, and a higher path for inflation, we attach greater urgency to proceeding with policy normalization.

I also think that using language like that in alternative C is appropriate to announce the start of normalization when the time comes. The changes from the draft circulated in June are all sensible and represent positive improvements. Thank you.

CHAIR YELLEN. Thank you. President Bullard.

MR. BULLARD. Thank you, Madam Chair. I support alternative B for today, and I support the "some" language in paragraph 3. In my opinion, the Committee is in a good position for a September liftoff, depending on the incoming data. If we are able to make the move based on relatively good news, it will be a good day for the U.S. economy.

I support the idea of starting the normalization process soon and going at a more gradual pace from there, depending on how the economy evolves. I think we have maintained what are essentially emergency policy settings for a long time—possibly too long. If we get into a position in which we have to move rates higher at a faster pace, the result may be considerably more volatile for financial markets and for the economy as a whole.

Regardless of how monetary policy evolves during the remainder of this year, we have already committed to an exceptionally accommodative policy over the coming quarters and years. This bet has already been made by this Committee. In my view, President Kocherlakota will get his wish. Under reasonable assumptions on labor force participation and the ratio of payroll employment to CPS employment, the U.S. unemployment rate will soon fall well into the 4 percent range and possibly even to 4 percent over the forecast horizon, according to staff analysis. I also think that inflation will move toward target over the forecast horizon as temporary effects from oil and the dollar abate.

If we evaluate outcomes on inflation and unemployment based on a quadratic objective, we have rarely been as close to our goals over the postwar era as we are today. Yet policy remains at very aggressive settings, with the policy rate at zero and the balance sheet at $4.5 trillion. We would be wise to find an appropriate opportunity to carefully back off these emergency settings. An appropriate monetary policy will have the important benefit of extending the length of the expansion by moving rates to more normal levels and hedging our bets against imbalances that might develop, as they did during the 1990s and the 2000s. The financial wealth-to-income ratio is higher today than it was in 1999 or 2007.

I have just a few comments on alternative C. In general, I think this statement will serve us well in the event of liftoff. In paragraph 3, if I understood President Lacker's suggestion, I would support truncating the last sentence at "highly accommodative" and simply ending the statement there. That was your suggestion, I believe. That would make some sense and is something we could consider. In paragraph 4, like President Mester, I would prefer the "economic conditions relative to" language as opposed to the "deviations from." Despite my nerdiness in liking "deviations" language, I think it's too nerdy and too technical for a document of this type. So it would be more appropriate to say "economic conditions relative to." I also like the "balanced approach" language. I've always felt as though that was excellent language to describe the Committee's approach, but I want to further consider President Williams's comments on this. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Fischer.

MR. FISCHER. Thank you, Madam Chair. I support alternative B, particularly its identification of where we have made further progress toward our goals, which is primarily in the labor market, and situations that are more complicated, which is primarily with respect to inflation. With regard to the labor market, I support the inclusion of the word "some" in alternative B. With regard to inflation, I am reasonably confident that inflation will move back to our 2 percent objective over the medium term, and I hope that we will be able, at the end of the next meeting of the FOMC, to put in place language like that in alternative C of this meeting's Tealbook, though I reserve the right to suggest changes in September's alternative B.

In last month's Tealbook A, Michael Kiley was responsible for a box that noted that the economy is closer to our goals now than it has been at just about any time over the past 50 years, as President Bullard has just said. This helps explain why, in the July Tealbook B, Taylor rules with no inertia indicate that the federal funds rate is far too low. The Taylor (1999) inertial rule is also in agreement that it is time to begin normalization. If one consults the table on page 11 of Tealbook B, one sees that all of the six rules that are included in that table suggest takeoff this year, most of them—almost all of them, in fact—in September. It is noteworthy that every one of the six monetary rules whose outcomes are presented in that table, which includes the dynamic results of the use of both the first-difference and optimal control rules, shows core PCE inflation rates of 1.6 to 1.8 percent in 2017 and 1.8 to 2 percent in 2018.

Indeed, it is striking how little difference the different monetary rules make to the behavior of unemployment and inflation rates through 2019. If one were to choose on the basis of the results of the rules shown on page 11, it is probably the first-difference rule that would come out ahead, although, in this case, one would very much like to see the extension of the simulations beyond 2019, because this is the rule that produces the Kocherlakota result but it doesn't show us the dynamics of the bounceback to target.

The dynamics of the FRB/US model mean that it's hard to argue forcefully, on the basis of that model, about the perfect moment to move rates. We've probably all said at some time that it's unlikely to make much difference whether we lift off in September or December—we used to say June or September—for we will be discussing an interest rate difference of only 25 basis points for one quarter. Actually, we say that, but with most of the rules we have, we're actually discussing a path that is probably higher by 25 basis points for a very long time. So it's more than one quarter.

I want, nonetheless, even if it were true that it didn't make much difference, to mention eight reasons for starting the process of normalization. First and foremost, we need to look ahead and set a framework for our strategy of normalization. That strategy should be—and the Chair has said this repeatedly—timely and gradual. We control the timeliness. The data control the gradualness. At present, I believe the process will be gradual. We should continue to make it clear, as the Chair has done and continues to do, that we believe that is what will happen, but we cannot promise it.

Second, we've now held the nominal interest rate at its effective lower bound for six years and eight months. In so doing, we've been sending a signal that the situation in the U.S. economy is still extremely far from being normal. The interest rate aside, I do not believe that the current situation is extremely far from being normal, and I do not think that sending that message is good either for the economy or for the citizens of the United States. I do believe that if the FOMC sends a well-reasoned signal that we think the U.S. economy is now strong enough to begin normalizing the interest rate, we would be providing an important boost to confidence for businesses and households.

Third, I think that beginning normalization, when we've met the criteria that we have set out to meet, will enhance the credibility of the FOMC. Conversely, if we continue to delay, market participants and Fed watchers will not know what to make of our communications, and our credibility will suffer. We may, as a result of the Great Recession, be entering a period of a new normal, but there is no normal in which the federal funds rate should be kept near zero.

Fourth, we need to move because we have to regain our freedom of action to deploy a normal, two-sided monetary policy. On the basis of revealed preferences, we seem to have given up on the use of QE. I continue to be puzzled, however, by the argument that we should not raise the interest rate from the effective lower bound because we might have to return it to that level. I believe that we made considerable progress yesterday when Governor Tarullo, I think it was, began to talk about the desirability of building up a policy safety cushion to deal with possible future negative shocks to aggregate demand and to output.

Fifth, that safety cushion should include a least two elements. The first is an interest rate level that is sufficiently high to provide a significant impetus to aggregate demand while being cut to a level above the effective lower bound. The second is either a willingness and ability to conduct normal, expansionary monetary policy through open market purchases or a balance sheet sufficiently large that variations in the rate of runoff can be deployed to adjust the level of stimulus provided by the size of the balance sheet. Now, this choice invites further thought on the timing and methods of normalizing the size of our balance sheet, which we began to discuss very interestingly and constructively yesterday and which I won't consider further today.

Sixth, the interest rate conveys price signals, among them a signal about the cost of waiting to make investment expenditures. As long as we keep the interest rate at zero, we're keeping the cost of waiting extremely low. By beginning normalization, we would be sending a message that delaying an investment in capital equipment may be costly for a business, as the interest rate may increase.

Seventh, we're considering a measure that will move monetary policy from an ultra-expansionary stance to an extremely expansionary stance. As we say in alternative C today, monetary policy will continue to be extremely supportive of economic growth. And that will be for some time after we begin normalization, for we are not about to lift off, which is vertical—we're about to begin the process of gradual normalization.

Eighth, we have to stop giving the impression that we are frozen in place. Among the incoming data in every period, there will be data that are less supportive and data that are more supportive of beginning liftoff. Each of us is free to emphasize one aspect or the other of that set of numbers. But as I said yesterday, we need to look at the big picture. That picture is of an economy growing slowly, at the rate of about 2 percent or a bit higher, but with a labor market that has worked remarkably well over a long period, despite having had to contend with little support from fiscal policy and sometimes with a contractionary fiscal policy. It's had to contend with an appreciation of the currency that has significantly reduced aggregate demand and some surprisingly negative influences from the decline in the price of oil. But despite all of that, as of now, the unemployment rate is near most estimates of the longer-term unemployment rate provided by participants in the SEP, and it is projected to continue declining. And it is reasonable to expect the inflation rate to move back to our 2 percent objective over the medium term.

The criteria for beginning normalization have very nearly been met, and we need to be willing to move. The balance we need to strike was set out yesterday in the Chair's concluding remarks. Of course, we are data dependent, and if the data falter again seriously or if the economy gets hit with a significant new negative shock, we will want to wait to see how things unfold. But I would caution against interpreting small weaknesses as a reason to delay further the beginning of the normalization process. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Tarullo.

MR. TARULLO. Thank you, Madam Chair. I support alternative B, and, while I remain open to increasing the funds rate in September, as things currently stand and as I expect them to develop in the next seven weeks, that would not be my preferred policy option.

Looking now at the two criteria we have laid out for the first federal funds rate increase, I think that, with respect to labor markets, there is no question that there has been a lot of improvement. But, for reasons I have explained multiple times at multiple meetings, I still believe there is a nontrivial amount of additional slack that could be taken up, and there are still no persistent signs of accelerating wage increases. It seems to me unlikely that, if and as those accelerating wage increases come, they would be rapid. So in a noninflationary environment, I regard the present circumstances as an opportunity to get further improvement in labor markets, in line with the part of our statutory dual mandate that obliges us to seek maximum employment. As I think Presidents Evans and Kocherlakota have already pointed out, that effort may, in turn, help pull us closer to the inflation target.

I want to note in passing, because there have been a number of references to people's projections of the longer-term natural unemployment rate, that I personally think the natural unemployment rate is lower right now than I would anticipate it being in the longer run because of things like the unusual number of people working part time for economic reasons and the still-lower labor force participation rate. As those things normalize over time, I would expect the natural rate to be closer to 5 percent, but my sense right now is that it is probably a little bit lower than that.

With respect to inflation, here, to be honest, I am having a hard time seeing how, right now at least, we can have reasonable confidence that inflation will return to the 2 percent target. As a background point, I'll note that FOMC practice does not appear to have maintained a symmetrical loss function with regard to the inflation target over the recent and, indeed, medium-term past. Over the past 20 years, inflation has been over target mostly because of oil shocks, but it has spent quite a bit of time under target, including much of the past eight years. Now, just by dint of the fact that I read what I'm about to say in one of the economic blogs, I can't vouch for its precision, though it's a pretty good blog. But the author had calculated that core and headline PCE inflation over the past 20 years averaged 1.75 percent and 1.86 percent, respectively, both under and, indeed, somewhat comfortably under what the FOMC has first implied and then said is its inflation target.

Next, I'll note that, although it is quite reasonable to state at a conceptual level that inflation should rise as the output gap shrinks, that intuition doesn't tell us when is the best time to increase the federal funds rate and how quickly inflation may set in. Even if we are approaching full employment, we don't know when and how quickly inflation would start to rise. Most answers I have heard to these questions that have counseled moving soon or, indeed, have counseled moving some time ago have basically been a matter of inference from past experience and correlations. Reasonable as that approach is as a starting point for policy decisions, I don't think it should ever be an endpoint, particularly when current circumstances differ in significant ways from the past circumstances in which those correlations were observed. And I believe it's hard to get away from the fact that the environment we're facing now is the product of a major financial crisis and the most serious recession we had had since the Great Depression.

What are some of the potentially different relevant circumstances today? Well, I see some of them as including the low-growth and disinflationary global environment and the seeming increases in propensities to save and to sit on a whole lot of cash, which may be associated with low levels of investment returns. Indeed, somebody drew my attention to the responses from the primary dealer survey to the question that was posed there about the current level of real equilibrium interest rates. When one reads some of those responses, one may fairly ask just how much accommodation we really are providing right now. Economic growth is near trend, and we're at the zero lower bound with the balance sheet where it is, and, in most people's view, at least, we are not growing at substantially above trend.

I'm also sympathetic to those who counsel patience because we have ample means to tighten and to tighten pretty quickly if necessary, whereas, as we discussed yesterday, we at present have quite limited means for further accommodation if a federal funds liftoff were to prove premature. It's not just a question of saying, "Well, would we go back immediately to zero if we needed to?" I believe we may increase the chances of a problem by lifting off somewhat prematurely. Obviously, there are some risks associated with a potential need later to go on a somewhat steeper rate, but that's, as is often the case, a matter of balancing potential costs and potential benefits. My own judgment is that the risks of moving prematurely are greater than the risks that a later, quicker move—presumably in an environment in which the economy is growing more quickly and inflation is actually rising—would pose. So my present inclination is, we should be awaiting some more concrete basis—both for thinking that we're getting close enough to eliminating the output gap and for believing that price rises rather than, say, reduced profits will ensue—before assuming a position of reasonable confidence.

Finally, I do take seriously the proposition that, under certain unusual circumstances, it may be appropriate to tighten policy even in the absence of either maximum employment or inflation heading above target, on the grounds that failure to take such action would pose significant risks to attainment of those statutory objectives in the medium term. I also agree that such instances may be more likely to occur after a long period of stability and interest rates at low levels. But those risks don't seem especially high right now. There is ample reason to be paying attention to leverage and funding vulnerabilities, particularly outside prudentially regulated institutions, but right now, we don't have generalized asset levels above historical norms with unusual amounts of leverage. And, unlike some other countries, we don't have the kind of activity in residential housing that would warrant action, even action specific to that sector, although that would, of course, require that anyone in the U.S. government actually had authority to take such action, which nobody actually does.

I am open to the possibility that there could be significant changes between now and September. But if we just keep chugging along between now and then without seeing something a bit new, I think my preference would be not to move.

I want to make mention of something, and Vice Chairman Dudley may be returning to this theme in a moment. But I do want to take notice of the points that Vice Chairman Dudley has quite sensibly made about why, other things being equal, December might not be the best time for an initial liftoff. And I would add to the things the Vice Chairman has previously said the possibility of some fiscal drama at the end of the year. I don't think he was trying to suggest that those considerations should be dispositive, only that they should be taken into account in deciding between September and possibly December or, for that matter, between December and possibly March.

Looking at the language in today's statement—specifically "some," which is, I think, all there is to talk about in today's statement—I have, as people know, generally been in favor of using paragraphs 1 and 2 to signal changes in our views, both of what's happened and of what's going to happen. I've been somewhat leery of making changes in paragraph 3, on the grounds of, as I've said before, my little homey metaphor of a kitchen timer going off.

I don't think the insertion of "some" rises to that level. I don't believe it's like some other adjectives that have been proposed over time. It's a little ambiguous, actually, and might be read a little bit differently than people expect, but I think the odds are that it will be read as verifying or validating what the Chair said at her monetary policy testimony. So although that doesn't really reflect my own policy preference, I have to say that, if I end up coming around to the September view—or losing the battle and the FOMC moves anyway—as a matter of cost minimization, I don't believe we would have wanted that move to have come as a surprise. Again, looking at the interests of monetary policy as a whole and the Committee as a whole, I think it is not a bad idea to inject something that at least will probably be read as validating what she said. And I'm a little concerned that if there were no change in the statement at all, it might be read as saying the Committee backed off a little bit. Now, in the wake of all of the use of the word "September" by a number of you over the past several weeks, maybe that's not that much of a risk, but I think it's still some risk. Because people do look at what the Chair is saying and what the Committee is saying, that's probably where we should be.

On the liftoff language, notwithstanding the fact that I'm probably at the other end of the policy spectrum from President Lacker, I agree with President Lacker's suggestion to delete the clause “and will continue to support a strong economy” in paragraph 3, in part because I’m just not confident that we actually would continue to support a strong economy. With respect to paragraph 4, I would prefer, wonkiness notwithstanding, the “deviations from” because I think it tracks more precisely what people have said, over time—that we’ve actually got a symmetrical loss function. We look at both of them; we see the deviations. Then, for the same reason, I do like the “balanced approach” language, although, like everybody else, when the transcript comes out, I will study President Williams’s comments. Thank you, Madam Chair.

CHAIR YELLEN. Thank you.

MR. WILLIAMS. I could repeat them. [Laughter]

MR. TARULLO. Can you give them to us? Actually, if they’re written out, President Williams—several people might feel the same way—it might be really helpful if you could distribute them rather than our having to wait for the transcript.

MR. POWELL. I’ll wait for the transcript. [Laughter] I’m sorry. I couldn’t avoid it.

MR. WILLIAMS. If you were sorry, you wouldn’t have said it. [Laughter]

CHAIR YELLEN. Governor Powell.

MR. POWELL. Thank you, Madam Chair. I support alternative B today. If incoming data arrive about as anticipated and the balance of risks doesn’t materially shift in a negative direction, I expect that I will continue to support a September liftoff as a reasonable course of action. To me, the test of further improvement in the labor market seems to have been met. Although I believe there’s still some amount of slack, labor market conditions are now certainly more than close enough to full employment to warrant liftoff. So I would look for continued job gains and other evidence that the labor market continues to tighten.

The more difficult question is clearly whether there is a basis for reasonable confidence that inflation will move back to its 2 percent objective in the medium term. Current readings, especially headline, are well below that objective and will remain so through the end of the year. However, that is mostly, but not entirely, due to lower oil prices and the stronger dollar, which are transitory factors that I would be inclined to look through. Underlying core inflation is actually closer to 1.7 percent or so, not that far from our objective. I'm reasonably confident that inflation will eventually rise toward the 2 percent objective as long as the economy and, especially, the labor market continue to tighten and as the effects of previous commodity price declines and the higher dollar recede. Of course, the recent further commodity price declines and the rise in the dollar make it quite unlikely that we will see much pickup in inflation, if any, by September.

Current readings do present a significant communications challenge, and that would be a greater concern for me if I thought that inflation expectations were under serious pressure. I do not believe so. Survey measures are stable. Market-based readings declined with the recent declines in oil prices, but only at the short end. Five-year, five-year-forward breakevens have been, on net, just about stable since the June meeting, and those are the ones that I would tend to look at for longer-term inflation expectations. As our discussions about when to lift off presumably wind down, I believe it will be important that the Committee's actions are supportive of its words—specifically, the oft-expressed view that policy will be data driven and not fall into an excessively predictable rate path.

Turning to the statements, I would include the word "some," and I would offer a slightly different reason. I accept and support the reason that it does acknowledge progress to date. But in a world in which we're depending heavily—at least I am—on Phillips curve concepts for believing in future inflation, there's the sense that, even though we may have already met the employment test for raising rates, continued progress in the labor market, along with continuing tightening in the economy, is one of the fundamental things that will give us reasonable confidence about the future course of inflation. I would want to see additional progress, notwithstanding that we may, in my view, have already met the employment part of the test. So I like "some" for that additional reason.

Turning to alternative C, I like the economic growth language in paragraph 3 because I do think, again, economic growth is important for inflation. If there were a risk of overshooting on inflation or something along those lines, then I would be concerned about too much emphasis on that part of the mandate. But I don't see that issue here. In paragraph 4, I prefer the "economic conditions" language to the "deviations" language. I'm not sure why we need the "balanced approach" language, as there's a sense that putting in that language implies that there's some tension between the objectives. I don't see that tension here. So I, too, will review President Williams's language and want to think further about that. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Brainard.

MS. BRAINARD. Thank you, Madam Chair. I can support alternative B. The labor market has continued to improve, and I expect to see further progress toward full employment before liftoff begins. By contrast, inflation has remained notably below our target, with no concrete progress that we can point to. Furthermore, currently low measures of underlying inflation, subdued wage growth, the limited effect of higher resource utilization on wages thus far in the recovery, and some hints that inflation expectations have moved lower suggest that the movement of inflation toward our target as resource utilization tightens could be quite slow, with risks tilted to the downside. Together, these conditions do not currently make me reasonably confident that inflation will return to its 2 percent target over the medium term.

Let me turn to the important question of whether the improvement in the labor market and the inflation outlook will be sufficient by our next meeting, or is likely to be sufficient, to warrant the commencement of tightening. By the September meeting, we will have received employment reports for July and August, an ECI reading for the second quarter, and second-quarter compensation per hour data as well as revisions to GDP, productivity, and compensation over the past three years. These will be very important in thinking about labor market conditions and the future trajectory of economic activity. If employment growth increases strongly, slack declines noticeably, nominal wage growth shows more consistent signs of firming, and the economic outlook is favorable, I believe that the labor market will have improved enough for liftoff to occur, but only if inflation also looks set to rise to 2 percent.

It's certainly possible, although it seems less likely, that we will receive data by September that would give me reasonable confidence that inflation will rise to 2 percent over the medium term. On the first day of our September meetings, we'll receive the CPI for August, and, of course, we'll already have in hand the July CPI. We'll have also received another Michigan survey of inflation expectations for August and a preliminary reading for September as well as another month and a half of data on market-based inflation expectations. If the staff inflation forecast is correct—and it's been relatively accurate of late—the most recent estimate of the 12-month change in the core PCE price index will be 1.3 percent at the time of our meeting, the same as the average rate of core inflation over the past three years. If survey- and market-based measures of inflation expectations also remain near their current levels, it would be difficult to justify that our confidence had increased sufficiently to meet the reasonableness test.

Instead, justification would have to come from the strength of the labor market and the belief that this strength will soon show through to inflation with sufficient force to boost inflation to 2 percent over the next two years. Whether labor market developments by September can, by themselves, justify reasonable confidence, which is the underlying premise of the description of economic conditions in alternative C, is a question I will be wrestling with over the next month and a half.

Moreover, there remains a fair risk of continuing downward pressure on inflation from dollar appreciation and falling commodity prices, based on the foreign economic outlook. China is slowing to an unknown degree and appears to be exerting a material influence globally on both commodity prices and the economic growth prospects of commodity exporters. Economic difficulties in important emerging markets, such as Brazil and Russia, seem likely to continue for some time, and any contribution of Europe to global demand is likely to be quite limited. When the contrast crystallizes between a United States starting on a tightening path and foreign economies in which monetary accommodation is likely to continue, the risk of additional dollar appreciation may well increase.

I've heard the case made to lift off in September and then stay on hold for some time. The risk with that strategy is that markets will surely put great weight on any action we take, but perhaps less on an expected path that is subject to a great deal more questions of interpretation and uncertainty, as I think President Kocherlakota noted earlier. I do believe September should remain a live option. But, based on the reading of the data we have available today, along with the additional data that will be available to us at the September, October, and December meetings, as against the substantial uncertainty around the degree of tightening we could see through the markets, it would make me want to maintain optionality around December from a risk-management perspective.

In that regard, it's important to address the questions that have arisen about whether we need to view September as the last viable option to move this year. I find it hard to accept that logic, although, of course, I think it's important to be mindful of possible end-of-year market dynamics and possible risks around the debt limit. Nonetheless, I believe we have the tools and the capacity to manage those risks.

In short, I would favor liftoff in September only if both inflation and labor market conditions make it compelling, and I'd like to maintain optionality on December. Thank you.

CHAIR YELLEN. Thank you very much. Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you, Madam Chair. I support alternative B. It would be wonderful if the data were sufficiently definitive that we could confidently signal that we're highly likely to lift off at the next meeting. That would finally end the suspense. Unfortunately, I don't think that's the case. The growth momentum of the economy is not particularly strong, and inflation remains below our objectives.

Most important, relatively small differences in economic growth, productivity, and employment growth have quite important implications for the trajectory of the unemployment rate and the amount of labor slack in the economy, and that then feeds into the appropriate timing of liftoff. So I, for one, remain very much data dependent in terms of my own thinking about September. I can imagine scenarios in which it would be easy for me to support liftoff in September, scenarios in which I couldn't support liftoff, and some in-between ones in which I would have to reflect very carefully about whether it made sense to wait longer. The key for me will be the state of the labor market, the degree of forward momentum in the economy, and the degree of downside risk to the economic outlook. If the risk of a quick return to the effective lower bound were to diminish, that would also influence my thinking.

I'm also going to put some weight at the margin on the fact that September does have better characteristics, compared with December, in terms of the timing of the initial liftoff. People will be around after the September meeting. Markets will be deeper. In my view, in September, there will be less risk of a messy start to the normalization process compared with December. I think that's important because that potentially could affect our credibility in the liftoff process.

In terms of alternative B, I think it keeps our options open. It says we're making progress toward our objectives, but not so much that we're highly confident that the conditions will be in place to begin to normalize at the next meeting. In terms of language, I think the word "some" sends the right message. We've made some progress in terms of the labor market, but we're not quite there yet, and I think market participants will interpret it in the correct way.

In terms of alternative C serving as a template for what the statement should look like at liftoff, I'm broadly supportive. In paragraph 4, I prefer the "economic conditions relative to" phrase compared with the more wonky "deviations from." I also think the first sentence of paragraph 3 could be shortened quite a bit. It really reiterates a lot of the thoughts that are in paragraph 2—the "objective of maximum employment" and the expectation that "inflation will rise, over the medium term, to its 2 percent objective." So I'd like to at least put on the table for consideration something much shorter. We could just say "our dual-mandate objectives" and shorten that first part of that sentence down significantly. People know what our dual-mandate objectives are; we've said it in paragraph 2. So I'm not really sure we need to repeat it all in what is a five-line sentence right now. It's really quite a run-on type of sentence.

In terms of the "balanced approach," I'm sympathetic with President Williams. It could be misinterpreted because sometimes our objectives don't conflict. What does a balanced approach mean in that context? I guess I need to be convinced about what it adds to the statement to feel that it should be in the statement. So I'm slightly leaning against it on that point, but I'd like to see President Williams's remarks, too. I'll take them before the transcript. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Thanks for a very good discussion of the policy issues that we face. I heard a couple of suggestions in the go-round for changes but, on balance, quite broad-based support for alternative B as written. So let me propose that we vote on alternative B as written. Matt.

MR. LUECKE. Yes. The vote will be on the statement language from alternative B, shown on pages 6 and 7 of Thomas's handout, and on the directive on page 11 of that handout.

Chair Yellen	Yes
Vice Chairman Dudley	Yes
Governor Brainard	Yes
President Evans	Yes
Governor Fischer	Yes
President Lacker	Yes
President Lockhart	Yes
Governor Powell	Yes
Governor Tarullo	Yes
President Williams	Yes

CHAIR YELLEN. Thank you all very much. Now, before we break up, there are a couple of things. First, the topic of looking at our long-run framework came up yesterday, and I indicated that I wanted to make a couple of comments about that. So if you don't mind, I have some brief comments.

I definitely think it's appropriate for us to begin to evaluate the issues that are going to bear on our decisions concerning a long-run implementation framework, in spite of the fact that, under our baseline outlook, it's going to be a number of years before we need to make any final decisions. And I believe we've all agreed that we're going to be learning a great deal about the efficacy of our various policy tools during the normalization process. But because I think we want to get a head start on this, I've asked Thomas and Simon to organize a System effort that will examine a number of important issues.

Now, we had quite a lot of previous staff work on this topic. It was presented to the Committee in 2008, and that provides a solid foundation for the work ahead. As some of you may recall, the 2008 work focused largely on alternative systems that could be used to target the federal funds rate. I'd expect that the basic issues of what rate we should target and how we should employ our policy tools in doing so will be a key part of the current effort as well. But as we were discussing yesterday, there are a number of developments since 2008 that I think warrant additional study. An important one is, I do believe it's appropriate for us to consider how robust any monetary policy implementation framework is to future adverse shocks that could result in a return to the zero lower bound. In addition, regulatory and other structural developments since 2008 may be affecting financial institutions and markets in ways that could influence our choice of implementation framework. In light of our experience of conducting large-scale asset purchases over recent years, we need to give some thought to the long-run structure of our assets and liabilities that best supports our macroeconomic and financial-stability objectives.

I think we should aim to benefit as much as we possibly can from the expertise and the insights of staff members across the Federal Reserve System. On top of that, it may be appropriate to solicit input from academics and others on a number of the broader issues.

Certainly, we will also want to consult with experts at other central banks, many of whom have confronted or will be confronting similar questions.

Assuming that the Committee is comfortable with initiating a System effort on this set of topics, I've asked Thomas and Simon to send a letter soon to all research directors with some additional information on the proposed scope, organization, and timeline of this project. We would hope to identity over the summer the membership of some of the core working groups that we intend to put together, and we're thinking tentatively that this is a project that might well run through the end of next year. I expect that the System groups exploring these topics will be reporting back to the Committee on a periodic basis, and there will be many opportunities for input by FOMC participants throughout this effort. So I'd be happy to take questions, and Thomas and Simon would as well, if there are any at this stage. But our plan is to provide additional details shortly to the research directors. Vice Chairman.

VICE CHAIRMAN DUDLEY. I'm very much supportive of this. Not to do this would be, I think, a dereliction of duty. We're at a particular point here of starting from a very different regime, with a different balance sheet and a different regulatory environment. So I would encourage the staff and everyone around the table to be very open minded in their view and to look at this issue broadly, without any prejudgment about what we should go to, because there are many things that we're going to have to balance here. There's going to be a lot of learning that we're going to have to do as we go through the normalization process and see how some of these new tools, in fact, actually work. So my advice is to look broadly and be open minded, because I believe we should really view this as an opportunity to think about what regime we want to have in place 5 or 10 years from now.

MR. FISCHER. Madam Chair?

CHAIR YELLEN. Governor Fischer.

MR. FISCHER. Thanks. I also strongly support this initiative. I just want to get some more defined idea of what will be included. There's everything that happens around this table. Is that part of the framework that you want examined?

CHAIR YELLEN. When you say "everything that happens"—we're thinking about the operating framework. When you say "around this table," do you mean our decisionmaking framework?

MR. FISCHER. Yes.

CHAIR YELLEN. No, it's not about our decisionmaking framework. It's about execution and our operating strategy for monetary policy. I'm assuming we're going to stick with the "tried and true" for decisionmaking.

MR. FISCHER. Okay. Well, "tried," anyway. [Laughter]

CHAIR YELLEN. Or "tried and whatever"—longtime methods for running the Committee. President Kocherlakota.

MR. KOCHERLAKOTA. Thank you, Madam Chair. I think this is great. I'm very appreciative of you and the staff for launching this effort. I'll commend especially the openness to seeking input from outside constituencies like academics and other central banks. That could be incredibly informative for this very complicated problem that the Vice Chairman just outlined. Thanks.

CHAIR YELLEN. Great, thanks. President Lacker.

MR. LACKER. I, too, commend the effort. I can't fault making a systematic study of this. Communication is going to be key. If we're going to go outside, I think we want a communications strategy concerning what this is about that's pretty robust so that it's not just dribbling out. In that regard, a tricky issue is that it was less than a year ago that we adopted a normalization plan. I take it from what you're saying that what balance sheet we're headed to might be on the table. Is this intended to reopen some of those issues?

CHAIR YELLEN. I think what we said at the time was, the smallest balance sheet consistent with an efficient and effective conduct of monetary policy, and primarily Treasury securities.

MR. POTTER. That is a constraint.

MR. LACKER. All right. So you don't view this as reopening that.

VICE CHAIRMAN DUDLEY. No, I don't think so.

CHAIR YELLEN. I wasn't thinking of reopening that.

MR. LACKER. Well, that makes communication a little easier.

CHAIR YELLEN. There are two further things. First, I want to confirm the date of our next meeting and note that it will be held on a Wednesday and Thursday, not a Tuesday and Wednesday. It'll be Wednesday and Thursday, September 16 and 17. Then I wanted to tell you that Linda Robertson is prepared to now give us a legislative update. I guess lunch will be available, Matt, at 11:30? For those of you who are able to stay, I think it makes sense for Linda to begin her legislative update now. And for those of you who are still here at 11:30, lunch will be served next door. The meeting is adjourned. Thank you, all.

END OF MEETING