Meeting of the Federal Open Market Committee on July 25–26, 2017

A joint meeting of the Federal Open Market Committee and the Board of Governors was held in the offices of the Board of Governors of the Federal Reserve System in Washington, D.C., on Tuesday, July 25, 2017, at 1:00 p.m. and continued on Wednesday, July 26, 2017, 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
Patrick Harker
Robert S. Kaplan
Neel Kashkari
Jerome H. Powell

Raphael W. Bostic, Loretta J. Mester, Mark L. Mullinix, Michael Strine, and John C. Williams, Alternate Members of the Federal Open Market Committee

James Bullard, Esther L. George, and Eric Rosengren, Presidents of the Federal Reserve Banks of St. Louis, Kansas City, and Boston, respectively

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

James A. Clouse, Thomas A. Connors, Michael Dotsey, Eric M. Engen, Evan F. Koenig, Beth Anne Wilson, and Mark L.J. Wright, Associate Economists

Simon Potter, Manager, System Open Market Account

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

Ann E. Misback,[1] Secretary, Office of the Secretary, Board of Governors

Michael S. Gibson, Director, Division of Supervision and Regulation, Board of Governors; Andreas Lehnert, Director, Division of Financial Stability, Board of Governors

[1] Attended Tuesday session only.

Margie Shanks,[2] Deputy Secretary, Office of the Secretary, Board of Governors

Stephen A. Meyer, Deputy Director, Division of Monetary Affairs, Board of Governors; Mark E. Van Der Weide, Deputy Director, Division of Supervision and Regulation, Board of Governors

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

Joseph W. Gruber, David Reifschneider, and John M. Roberts, Special Advisers to the Board, Office of Board Members, Board of Governors

Linda Robertson,[2] Assistant to the Board, Office of Board Members, Board of Governors

Joshua Gallin and David E. Lebow, Senior Associate Directors, Division of Research and Statistics, Board of Governors; Fabio M. Natalucci, Senior Associate Director, Division of Monetary Affairs, Board of Governors

Antulio N. Bomfim, Ellen E. Meade, Edward Nelson, Robert J. Tetlow, 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

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

Penelope A. Beattie,[2] Assistant to the Secretary, Office of the Secretary, Board of Governors

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

John Kandrac, Senior Economist, Division of Monetary Affairs, Board of Governors

Mark Libell,[3] Assistant Congressional Liaison, Office of Board Members, Board of Governors

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

David Altig, Kartik B. Athreya, Beverly Hirtle, Glenn D. Rudebusch, Ellis W. Tallman, and Christopher J. Waller, Executive Vice Presidents, Federal Reserve Banks of Atlanta, Richmond, New York, San Francisco, Cleveland, and St. Louis, respectively

Daniel Aaronson, Joe Peek, and Jonathan L. Willis, Vice Presidents, Federal Reserve Banks of Chicago, Boston, and Kansas City, respectively

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[2] Attended Wednesday session only.

Transcript of the Federal Open Market Committee Meeting on July 25–26, 2017

July 25 Session

CHAIR YELLEN. Welcome, everyone. Today's meeting, as usual, will be a joint meeting of the FOMC and the Board of Governors. I need a motion to close the Board meeting.

MR. FISCHER. So moved.

CHAIR YELLEN. Thank you. Without objection.

I regret to note that this FOMC meeting will be the last for our general counsel, Scott Alvarez. Scott will be stepping down in a few weeks from his dual roles as the Board's general counsel and the Committee's general counsel, and he expects to retire shortly after that. We will have the opportunity to celebrate Scott's retirement tomorrow afternoon, but it's also appropriate to recognize Scott's contributions to the conduct of monetary policy here, in the context of an FOMC meeting.

To start at the beginning, Scott received his B.A. from Princeton in 1977—in economics, I'm pleased to note.

VICE CHAIRMAN DUDLEY. But it didn't take. [Laughter]

CHAIR YELLEN. After receiving his law degree from Georgetown in 1981, he joined the Board immediately, no doubt reflecting a deep desire to resume his association with economists, which I think all of us will find completely understandable. Scott became a member of the Board's official staff in 1989 when he was promoted to assistant general counsel, and two years after that he became associate general counsel. In 2004, he was appointed general counsel both by the Board and by the FOMC. All told, Scott has been with the Federal Reserve for 36 years. Reputedly, Scott has quipped that he was born at the Board. If that is really true, that implies that Scott is now age 36. So he clearly has a long retirement to enjoy.

Following tradition, I might also note that, over his career, Scott has attended exactly 100 regularly scheduled FOMC meetings, counting today's meeting. It would be impossible to even begin to enumerate the areas in which Scott has made major contributions to the Federal Reserve. He has truly been integral to virtually all areas of our responsibilities, but we cannot let this moment pass without acknowledging the particularly crucial role Scott played in the dark days of the financial crisis and its long, difficult aftermath.

I've noted previously that Scott has advised successive Chairs, including myself, with deep expertise and utmost integrity. Speaking for myself, I'm enormously grateful for his wise counsel, calm, and good humor during times of stress, and, above all, his intense dedication to the public interest served by the Federal Reserve. Scott, we deeply appreciate all that you have done for the System and the nation, and we wish you all the best in your retirement. [Applause]

Regarding our formal agenda, our first item of business is to fill the upcoming vacancy in the position of the Committee's general counsel. As I think you know, the Board has appointed Mark Van Der Weide as its general counsel effective later this summer, and I would like to nominate him to also serve as the Committee's general counsel. I might note that Mark is seated there at the anteroom door.

Mark earned his law degree from Yale Law School in 1995. He worked in the Board's Legal Division from 1998 to 2009. In 2009 and 2010, he was detailed to the Treasury Department, where he contributed to the development of financial reform legislation. Since 2010, Mark has worked in the Division of Supervision and Regulation, including most recently as deputy director. Mark's selection as the FOMC's general counsel would be effective at the time he becomes the Board's general counsel. Scott Alvarez will remain general counsel until then. Consistent with the Committee's usual practice, the nomination is for Mark to serve as the

Committee's general counsel until the Committee's first regularly scheduled meeting in 2018.
Do I have a motion on this nomination?

VICE CHAIRMAN DUDLEY. So moved.

MR. FISCHER. Second.

CHAIR YELLEN. Thank you. And without objection. Mark, congratulations on your selection, and best wishes with your new responsibilities. Now I'm going to turn to Simon for our Desk briefing.

MR. POTTER.[1] Thank you, Madam Chair. The intermeeting period was relatively uneventful, with most market attention on the possibility that the ECB, in response to the improving outlook in the euro area, is inching closer to reducing the pace of its asset purchases. In June, President Draghi stated that the threat of deflation in the euro area has dissipated and that the ECB could "look through" recent low-inflation data, which caused German and U.S. rates to rise, as shown in the first column of the top-left panel of the first exhibit. That said, the moves weren't large and did not have any notable spillover to other asset classes, especially in comparison with the so-called bund tantrum in 2015. Domestic risk asset prices remain supported by an improving global economic outlook and strong corporate earnings.

Meanwhile, the dollar depreciated against most G-10 currencies as several other developed market central banks either hiked rates or signaled they may be closer to doing so. One exception was the Japanese yen, which depreciated against the dollar. The Bank of Japan has remained committed to its current yield-curve-control framework.

The top-right panel shows the coincident moves in German and U.S. 10-year nominal yields following Draghi's comments. The 10-year Treasury yield, the solid blue line, is now in the middle of the range seen since the U.S. election and slightly above its 5-year average, the dashed blue line. Meanwhile, the 10-year German bund yield, the solid red line, remains below its 5-year average. The recent increase in bund yields has thus far been smaller than the increase observed during the bund tantrum in 2015, when bund yields rose more than 80 basis points. Recall that the bund tantrum was sparked by better-than-expected euro-area data and less-accommodative ECB communications and was exacerbated by the unwinding of investor positioning that would have profited from lower yields.

The middle-left panel shows that the level of three-month implied volatility on long-dated euro-area rates, the solid red line, was largely unresponsive to the rise in rates, especially when compared with the dramatic increase seen during the bund

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

tantrum. Implied volatility has generally been trending lower for long-dated rates in Europe as well as the United States, and both remain well below their five-year averages, the dashed lines. For U.S. rates, the level of implied volatility is currently half the level seen at the peak of the 2013 taper tantrum.

Overall, the ongoing low level of interest rate volatility suggests there was, at most, only a marginal shift in investors' expectations for developed-market central bank policy over the intermeeting period. Market participants still expect another reduction in the pace of ECB asset purchases to be announced later this year and to be implemented in early 2018. Most contacts expect asset purchases to conclude fully by the end of next year at the latest.

Despite the synchronized move higher in global yields following Draghi's comments, respondents to the Desk's most recent surveys did not rate changes in the outlook for foreign monetary policy as a particularly important factor in explaining changes to their probabilistic forecasts for the 10-year nominal Treasury yield since December 2016. As shown in the middle-right panel, changes to the U.S. inflation outlook was the highest-rated factor on average; this factor was also highlighted in the Desk's structured outreach to market participants on the current level of Treasury yields.

Market measures of inflation compensation and Desk-survey measures of inflation expectations have both declined since December, likely reflecting increased belief that inflation will continue to come in below the FOMC's 2 percent objective. As shown in the bottom-left panel, respondents to the Desk surveys now, on average, assign a roughly 60 percent probability to 12-month PCE inflation over the period 2 to 3 years ahead coming in at or below 2 percent. In December, the odds placed on this outcome were a bit below 50 percent. An increase in the perceived likelihood of lower inflation outcomes is also seen in the Desk survey's average PDFs for CPI inflation over the next decade.

Subdued inflation expectations were also reflected in a separate survey question that asked respondents to decompose the current level of the nominal 10-year Treasury yield. The bottom-right panel shows that the median response for average inflation embedded in the 10-year nominal yield was around 1.8 percent, identical to the 10-year TIPS-implied breakeven rate at the time of the survey. The median response for the 10-year average of the real rate was 0.5 percent. For the market-implied term premium, it was roughly zero, higher than the staff model estimates, the blue and gray diamonds. As you know, the staff has been focused on explaining the decline in term premiums both in the longer run and over the recent period. Steve and Thomas will provide additional analysis of this, using the staff memo analyzing factors that have been driving the 10-year Treasury yield since December 2015. In addition, it is useful to recall that one of the secular factors driving term premiums lower is the perceived increased attractiveness of safe long-term fixed income as hedging instruments in an era of contained inflation and central banks using large-scale asset purchases at the effective lower bound.

The top-left panel of the second exhibit shows that the synchronized rise in global yields over the period had little observable effect on U.S. and emerging-market equity price indexes as these indexes continued their relentless upward march. Higher equity prices and valuations continue to be a dominant driver of easier financial conditions. Emerging market equity prices, the light blue line, notably outperformed relative to the United States and Europe over the period, supported by a backdrop of improved global economic growth, including in China, whose latest real GDP figure "printed" above consensus expectations.

Investors generally remain confident that Chinese authorities will continue to manage the economy and financial system to achieve short-term stability ahead of the Party Congress in the fall. The onshore RMB appreciated slightly over the period, shown by the red line in the top-right panel. As shown by the dark blue bars, there was just a small net capital outflow over the period. Chinese authorities recently emphasized the importance of controlling financial risks, as concerns of excessive leverage remain top of mind for investors. Market participants anticipate that Chinese authorities will continue gradually tightening liquidity in order to slow credit growth over the medium term.

While many foreign central banks were seen as edging closer to a less-accommodative policy stance, the expected rate path in the United States was, on net, little changed, as shown in the middle-left panel. Over the period, market participants balanced the lower-than-expected inflation data with communications by FOMC leadership that it views the recent softness in inflation as likely to be transitory. The average probability attached to a rate hike at this meeting is roughly zero percent.

Nearly all respondents to the Desk's surveys now indicate December as the most likely timing for the next increase in the target range. Meanwhile, expectations have coalesced on September as the most likely timing for an announcement of a change to reinvestment policy, with respondents, on average, assigning a 60 percent probability to that outcome, as shown by the red bars in the middle-right panel. Expectations for a "little pause" in rate hikes when a change to reinvestment policy is announced appear firmly ingrained.

The approach of gradually phasing in redemption caps that was outlined in the Addendum to the Policy Normalization Principles and Plans at the June FOMC meeting was broadly consistent with market expectations, but the communication came sooner than many expected. The timing and detail prompted investors to increase the probability attached to an earlier announcement of a change to reinvestment policy.

That said, the addendum did not elicit significant market reaction, nor have previous balance sheet communications this year. The left half of the bottom-left panel shows that the median response to our June surveys ascribed no price reaction to reinvestment communications up to that point. Looking ahead, there is a dispersion of views on the effect that implementation of the outlined approach will have on Treasury security and MBS market pricing, as shown in the right half of the

panel. The median response to the Desk surveys indicates a 25 basis point effect on the 10-year nominal Treasury yield over the 2-year period following implementation of the plan and a 15 basis point effect on the MBS option-adjusted spread.

In free response answers about reinvestment policy, only a couple of survey respondents did note that the upcoming debt ceiling could affect the FOMC's decision to announce a change in reinvestment policy. Market participants generally expect the debt ceiling to bind sometime in October, consistent with the Desk's internal estimates shown by the dashed red line in the bottom-right panel. Although expectations are firmly that a resolution will be reached before that point, some investors have begun to reduce their exposures to bills maturing in October, causing bill yields to rise. Investor aversion to securities at risk of delayed payment is occurring much earlier than has been observed in past episodes.

Overnight unsecured rates shifted higher following the Committee's decision to increase the target range in June, as shown in the top-left panel of the third exhibit. With the exception of quarter-end, the effective federal funds rate and overnight bank funding rate both "printed" at 1.16 percent throughout the intermeeting period—exactly 25 basis points higher than before the target range increase. The rate increase was also transmitted to repo markets, with overnight Treasury GC repo rates increasing by around 25 basis points, as shown in the top-right panel.

Overnight RRP take-up, meanwhile, averaged about $200 billion over the period and increased to approximately $400 billion on quarter-end, as shown in the middle-left panel. Quarter-end conditions were characterized as orderly and as being in line with expectations.

FX swap bases widened only modestly over the quarter-turn, and demand at the central bank dollar auctions was fairly low. Market participants continue to cite more balanced supply and demand in FX swap markets as moderating upward pressure on the swap bases on quarter-ends and more generally. Indeed, the middle-right panel shows that FX swap bases have narrowed and stabilized at lower levels year-to-date.

With respect to demand factors, offshore U.S. dollar funding needs have reportedly been met by other sources, such as issuing dollar-denominated debt and attracting dollar deposits. Additionally, foreign investors, particularly Japanese banks, reduced their dollar funding needs by buying fewer or outright selling their U.S. dollar-denominated assets earlier this year. While Japanese investors were net sellers of foreign bonds during the first part of 2017, as you can see in the bottom-left panel, they have recently become net buyers again. This shift, should it continue, may pressure FX swap bases wider; indeed, the relative cost of borrowing dollars versus yen has recently increased.

As shown by the gray line in the bottom-right panel, three-month LIBOR–OIS rebounded a touch from its multiyear low but remains well below its level just before money fund reform. The spread between three-month LIBOR and OIS had narrowed to 9 basis points last month—much tighter than the level that was expected to prevail

following money fund reform. Similar to FX swap bases, contacts attributed the narrowing in part to banks' success in attracting new lenders to replace prime money funds rather than to changes in bank credit risk. Forward measures of LIBOR–OIS suggest spreads will remain around or slightly wider than current levels over the next few months.

Although LIBOR–OIS has narrowed, LIBOR, the red line in the bottom-right panel, continues to increase and is consistent with our measures of transacted CP and CD rates, the blue lines. This suggests that rate hikes and policy expectations are effectively passing through to term unsecured funding markets beyond those for federal funds and Eurodollars.

The Desk's domestic and foreign portfolio operations continued to proceed smoothly. In our euro reserves portfolio, we continue to place incoming proceeds from coupons and maturing securities in cash rather than invest them in short-dated instruments, which have a significant liquidity premium. Consistent with the recently revised framework and governance for foreign reserve management, the staff is preparing options on risk parameters for the Foreign Currency Subcommittee to consider for the next portfolio investment cycle starting in October 2017. Recall that key features of the new approach include an annual process for assessing policymakers' investment preferences and incorporating those into a risk–return framework for portfolio allocation. We will update the full Committee in September before starting to rebalance to the new asset allocation in October.

Small-value operational readiness exercises performed over the intermeeting period were successful, as summarized in the appendix, which also lists tests planned for the next period. There is one change to the plan that we communicated to you in January. We will add a small-value exercise of our securities lending program using a backup tool that has been built for use in the event of a FedTrade outage. The exercise will be conducted with the primary dealers during the upcoming intermeeting period and will have a maximum size of $115 million.

Thank you, Madam Chair. That completes my prepared remarks. We would be happy to take any questions.

CHAIR YELLEN. Are there questions?

MR. KASHKARI. Madam Chair.

CHAIR YELLEN. Yes, President Kashkari.

MR. KASHKARI. Thank you. I have two questions. Simon, on your exhibit 2, chart 11, bottom-left-hand panel, is there a respondent who is arguing that the reinvestment policy is going to lead to lower yields? Is that what the little dots at the bottom of the page are?

MR. POTTER. Yes, that's correct. It tends not to be from the dealers. It comes from the buy-side respondents. Do you see that?

MR. KASHKARI. I see it. Okay. And then in the 10-year Treasury yield—the third column—it looks like there is a group of investors who think there's going to be a meaningful effect north of 50 basis points. Do you have any color on that?

MR. POTTER. Again, looking through the responses suggests that it's mainly the dealers who think that. About 9 to 10 percent of the dealer respondents think it could be north of 50 basis points. We combine the results in the bin there.

MR. KASHKARI. Do you have any sense on what the ranges are?

MR. POTTER. The range, in terms of how high it could be?

MR. KASHKARI. Meaning 50 basis points. Is there a cluster?

MR. POTTER. It's 9 percent at 51 to 75 and zero after that.

MR. KASHKARI. I see.

MR. POTTER. But if you look at the mortgage option-adjusted spread, which is also in there, there's one who thinks it could be higher than 75.

MR. KASHKARI. I see.

MR. POTTER. You have two dealers who think it could be more than 50 for the Treasury yields and one who thinks the mortgage spread—even after the Treasury yields go up—could be more than 75 basis points.

Now, one of the things to be wary of here is that the median estimate in the light blue on the right-hand side lines up exactly with people who have been following the Board staff estimates of the term premium, and we don't know in our surveys whether we get back basically at the center. Having the Desk ask the questions is complicated. They may be thinking, "How

do we find an answer that doesn't make us look stupid?" Maybe we just go look at what they put out. It's hard to be sure. We do have some colorful free responses, and you can read those in the survey.

MR. KASHKARI. Thank you.

CHAIR YELLEN. Other questions for Simon? [No response] Okay. Seeing none, we need a vote to ratify domestic open market operations conducted since the June meeting. Do I have to motion to approve?

VICE CHAIRMAN DUDLEY. So moved.

CHAIR YELLEN. Thank you. All in favor. [Chorus of ayes] Thank you. Any opposed? [No response] No. Okay. Let us now proceed to the briefings, and David Wilcox will start us off on the domestic economy.

MR. WILCOX.[2] Thank you, Madam Chair. I will refer to the packet titled "Material for Briefing on The U.S. Outlook."

I will review the outlook more briefly today than usual. Then I will touch on a few key points of the memo on low inflation that we sent you two weeks ago and finish by describing another important respect in which labor market outcomes have differed by race and ethnicity.

Turning first to the outlook, our forecast of real GDP growth—panel 1—is essentially unrevised since the June Tealbook. In this forecast, we dialed back our assumed fiscal policy placeholder by halving its size and reducing its duration. However, the effect of this revision on top-line GDP growth was largely offset by financial conditions that are now projected to be a little more accommodative than in our previous forecast. In part, the more-accommodative financial conditions reflect the partial unwinding of changes we made when we first introduced the fiscal placeholder in December of last year. Mainly, this occurs through two channels. First, the shorter assumed duration of the stimulus reduces the longer-run real equilibrium funds rate, or r. And in turn, the lower r^* takes down the intercept in the policy rule that we use to set the funds rate in the projection. Second, the smaller amount of federal debt that the public needs to be persuaded to hold over the next decade or so reduces the term premium, all else being equal.

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

We also made the projected path of the dollar weaker than in our June projection. Although a portion of this revision reflects the slightly tighter stance of fiscal policy, part reflects intermeeting moves in the dollar that our international colleagues attribute to market participants' revised expectations for monetary policy in several advanced foreign economies.

Despite the difficulty that the House and Senate have been having in moving major pieces of their fiscal agenda, we continue to assume enactment of some fiscal policy expansion. It still seems plausible to us that the majority will be highly motivated to notch a major legislative achievement in advance of next year's midterm elections, and tax cuts seem to be one thing that the Republicans mostly agree on. For what it's worth, the online prediction market PredictIt continues to show a probability of about 44 percent that an individual tax cut will be enacted by the end of this year and 38 percent for a corporate tax cut; legislation passed next year but applied to the calendar year as a whole would have roughly the same effect on our medium-term forecast. Of course, we will continue to keep a close eye on these developments and update our assumptions as the outlook changes.

In addition to the 25 basis points that we trimmed out of r^* to reflect diminished fiscal stimulus, we trimmed a further 25 basis points after a broader review of the latest empirical evidence. That evidence was summarized in a note by Cristina Fuentes-Albero that went to research directors two weeks ago and was discussed in a box in the Tealbook. Together, these revisions leave our judgmental assumption regarding r^* at ½ percent.

For reference, panel 2 reproduces a chart from a recent note by President Williams that plots the average and range of r^* estimates from a set of five models. A year ago, I expected that r^* would show at least a little procyclicality, consistent with its behavior in two of the past three business cycles shown in the chart. Instead, it has been flat as can be, despite the further tightening in resource utilization. At ½ percent, our assumption is now squarely in line with the average shown in John's chart.

We didn't allow the lower interest rates associated with this second piece of our r^* revision to affect our projection of real activity on the grounds that it represents an assessment that, over the longer term, an easier stance of monetary policy will be required to achieve the dual-mandate objective than we had previously thought.

As shown in panel 3, none of the information that we've received after the Tealbook projection was finalized has materially changed our outlook. As one of my colleagues put it, it's all been a "nothing burger," which is the way we like it. With little change to the outlook for real activity and no important changes to our supply-side assumptions this round, our assessment of the cyclical position of the economy is essentially the same as we projected in June. In particular—and as you can see from panel 4, which plots the unemployment rate against our estimate of the natural rate—we view the economy as currently running a little hotter than its longer-run sustainable level. With the growth of output expected to exceed its potential rate, the

unemployment rate edges down further over the projection period. At the end of 2019, the unemployment rate is forecast to be 3¾ percent, unrevised from our previous projection and about 1 percentage point below our estimate of the natural rate.

Panels 5 and 6 summarize the inflation outlook. From March through May—as you know well—we were surprised to the downside on PCE inflation. Those misses prompted us to shave a few basis points per month out of our near-term projection. Compared with that slightly more guarded outlook, the CPI for June came in close to our expectation and implied essentially no further revision to our projection of PCE inflation. Over the medium term, the forecast is little revised. In particular, we continue to expect headline and core inflation to move up to 2 percent as the idiosyncratic factors that we think have been important drivers of the recent low readings drop out of the 12-month calculations, tighter resource utilization puts some modest upward pressure on inflation, and the underlying inflation trend creeps up to the Committee's 2 percent objective. But, as shown in panel 7 on the next page, despite our continued expectation that inflation will move up to 2 percent in the medium term, currently available data and our near-term monthly projection imply that throughout the remainder of this year we will continue to see 12-month inflation readings at or below 1½ percent.

The three-month losing streak from March through May laid the predicate for the memo by Andrea De Michelis, David Lebow, Jeremy Rudd, and Riccardo Trezzi. The memo evaluated a range of hypotheses for what could explain the latest bout of unexpected weakness. One basic conclusion is that the behavior of inflation over the past several years can be broadly explained in terms of its usual determinants, including an underlying inflation trend that is currently running a little below 2 percent.

A couple of the other key "takeaways" emerging from this memo are listed in panel 8. First, factors that defy easy labeling—one could call them own-equation shocks, although in panel 8 they're referred to as "other factors"—account for quite a lot of the variation in inflation. In other words, prior to the past couple of decades, a pretty good forecast of next year's core inflation was something close to this year's core inflation; inflation was a nonstationary process. More recently, however, and thanks importantly to the efforts of this Committee, those days seem to be gone, and inflation is now better characterized as moving around a stable underlying trend.

Although the own-equation shocks no longer seem to have very persistent effects, they often can obscure the influence of other, more fundamental determinants of inflation. To illustrate this point, I have reproduced a set of the memo's results in panels 9 and 10. These results are derived from a small vector autoregression, or VAR model, that can be used to decompose the deviations of core market-based PCE price inflation from its trend. Panel 9 plots these deviations from trend against the contribution made by our estimate of the unemployment gap, shown as the dotted line. To me, the panel makes a reasonably convincing case that the basic Phillips curve is still showing something of a pulse. However, that pulse is sometimes faint.

And as is shown in panel 10, the quarterly variation in inflation is driven much more heavily by the "other factors" that we often have a hard time explaining, even in retrospect.

In the baseline, we assume these factors that have been holding down inflation recently will fade away promptly. Of course, as the memo discusses at some length, we could be wrong in taking that view. For example, we could be wrong about the degree of slack currently present in the economy and its effect on inflation, the timing and magnitude of import price pass-through into domestic inflation, or the level of inflation's underlying trend. Alternatively, we might be missing some other important driver of inflation. The memo reviewed a number of factors that various outside analysts have suggested could explain the recent low-inflation experience; in a nutshell, while some of these candidate explanations pose credible downside risks to our baseline inflation projection, we failed to turn up anything sufficiently compelling to cause us to adjust our baseline. And not all of the risks lie to the downside. For example, we continue to see a plausible possibility that the Phillips curve is nonlinear, and that a steeper slope may become much more evident if, as we project, the unemployment rate moves considerably further below its natural rate.

Turning to the labor market, panels 11 and 12 reiterate and update information that I have shown previously about the differential experience of blacks, Hispanics, and whites. Panel 11 shows that the high-beta experience of blacks and Hispanics with regard to unemployment rates has continued. In particular, comparing average unemployment rates in the second quarter of this year with the average for the whole of last year, the rate for whites declined 0.5 percentage point, while the rate for Hispanics declined 0.7 percentage point and the rate for blacks declined 0.9 percentage point—the result for blacks being right in line with its usual multiplier of 1.8.

I will close by discussing another dimension of the relative labor market experiences of blacks, Hispanics, and whites. Panel 13 on the next page shows median durations of unemployment by race or ethnicity. As shown by the gap between the red and green lines, the median length of time that an unemployed African American has been out of work has consistently exceeded the comparable figure for whites over the past two decades. Perhaps surprisingly, the median duration experienced by Hispanics has tracked the duration for whites very closely and has even generally been a sliver lower. The gap between median durations experienced by blacks and whites averaged 3½ weeks during the expansion of the early 2000s. In the early years of the current expansion that gap widened, reaching an average of about 7½ weeks in 2011 and 2012. Panel 14 addresses the underlying mechanism that generates longer durations for blacks; it shows that in any given month, blacks are considerably less likely than whites to transition from unemployment into employment. Lately, about 27 percent of unemployed white persons transitioned each month into employment, while for blacks the comparable figure was only about 20 percent.

The bottom panel shows flows in the opposite direction, from employment into unemployment. These flows are not directly relevant for explaining the difference in durations shown at the top of the page but further help explain the higher unemployment rate experienced by blacks and Hispanics. In particular, as the bottom panel shows, both of those groups are much more likely than whites in any given month to transition from employment into unemployment.

All told, then, as we continue to fill out the picture of how the labor market experiences of blacks, Hispanics, and whites compare, the following key points emerge: An increase in aggregate unemployment is bad news for everyone. Among whites, when the national economy weakens, the extent of unemployment across their population increases, and the median spell of unemployment also increases. For blacks, the extent of unemployment across their population at the beginning of the Great Recession was already higher than for whites, and it went up by more during and after the recession. In addition, the median spell of unemployment among black workers was already higher than for whites at the beginning of the Great Recession, and it too went up by more. Hispanics appear to have presented something of an intermediate case: Their unemployment rate increased more than the unemployment rate for whites, but the median duration of unemployment increased only about the same amount as did the duration for whites. In the past few years, key labor market indicators have improved more for blacks and Hispanics than for whites, but those indicators remain no better than they were before the Great Recession. In other words, there appears to have been little if any net progress during the past decade or so in the labor market standing of blacks and Hispanics relative to whites. Steve will continue our presentation.

MR. KAMIN.[3] Thank you, David. I'll be referring to your next set of exhibits, labeled "Material for Briefing on The International Outlook."

Incoming data have largely confirmed the narrative for the global economy that has emerged in recent quarters. First, activity abroad continued its solid and widespread expansion. As shown in panel 1, after picking up briskly in the second half of last year, total foreign economic growth remained robust at 3¼ percent in the first quarter of this year, and we estimate it moderated to a still strong 2¾ percent in the second quarter. Squinting at the difference between the solid and dashed lines, you can see that second-quarter growth in the advanced foreign economies, or AFEs, is now estimated to be even higher than we had expected in June. Indicators for the euro area have been surprisingly strong, and we've boosted our estimates for Canada and Japan as well. By comparison, second-quarter EME growth appears to have come down a little faster than we expected earlier. However, this largely reflects what we believe are transitory developments in Latin America, where Brazilian output is falling back after its first-quarter spike in agricultural exports and Mexican activity is being restrained by a bout of fiscal consolidation. Subsequently, total

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

foreign growth moderates a little more, to its potential rate of about 2½ percent, and stays there for most of the forecast period.

Second, despite continued solid economic growth, inflation in the advanced foreign economies generally remains well below central bank targets and looks set to rise only slowly over the forecast period. As indicated in panel 2, headline inflation in the AFEs moved up sharply around the turn of the year, but that was mainly because of the rise in oil prices. Additionally, U.K. inflation, the red line, has been driven up by the post-Brexit depreciation of sterling. With oil prices now having declined since the turn of the year, headline inflation levels in Canada, the euro area, and Japan are projected to move down in the near term, while core inflation, shown in panel 3, remains quite subdued in the euro area and especially Japan.

The juxtaposition of solid economic growth and persistent weak inflation abroad—as in the United States—raises the question of whether declining resource slack and the pull of inflation expectations will really push inflation back up toward central bank targets or whether the inflation process has changed in some fundamental way. So far, our sense is that it would be premature to conclude that the Phillips curve model is entirely broken. As Paul Wood described in his pre-FOMC briefing last week, over the past year and a half, inflation in the AFEs has indeed come in lower than our inflation models would predict, but not by a great deal.

The scatterplot for the euro area that Paul showed in last week's briefing, panel 4, highlights the puzzle we face. On the one hand, looking at the data since 2000, there clearly is a Phillips curve. On the other hand, since 2014 (shown by the red dots), even as the unemployment gap has diminished considerably, core inflation has stayed weak and well below the indicated regression line. This development could indicate that the Phillips curve has further flattened, that there is more resource slack than indicated by the unemployment rate alone, that inflation expectations have significantly declined, or that structural forces that we are not accounting for are restraining prices. Any of these factors could keep euro area inflation from reaching the ECB's target. But it could also just be that inflation responds to unemployment with more of a lag than we've reckoned, or that inflation will pick up at a faster rate once the economy reaches full potential—a nonlinearity that David referenced in his remarks about U.S. inflation.

Against this backdrop of solid economic growth but moribund inflation, markets were surprised, as Simon has discussed, by the apparent shift toward more "hawkish" communications by several AFE central banks. The Bank of Canada hiked its policy rate, and both the Bank of England and the ECB alluded to the possibility of starting to remove accommodation in the context of further improvements in economic conditions. Despite the attention these communications received from investors and the financial media, however, we doubt that any of these central banks are going to withdraw monetary stimulus substantially faster than we anticipated earlier. AFE policymakers most likely are going to have to grapple with only slow recoveries of wage growth and inflation and, as a related matter, continued uncertainty about the power of diminishing slack to push prices upward. In consequence, as shown in

panel 5, while we now project these central banks will withdraw accommodation a little sooner than we judged in June, we still see AFE policy rates moving up only gradually over the forecast period and beyond.

Whether or not investors got it right in interpreting the utterances of foreign central bankers, the recent upswing in bond yields that Simon described attests to the power of foreign monetary conditions to affect U.S. markets. And it, therefore, also reinforces our view, as expressed in the memo on longer-term interest rates that we circulated to the Committee recently, that aggressive monetary stimulus abroad helps explain why long-term U.S. yields have remained so low since you started hiking the federal funds rate.

As indicated in panel 6, since the Global Financial Crisis, AFE central banks have undertaken substantial asset purchases. As we discussed in our note to the Committee, these purchases lowered term premiums in foreign yields, which, in turn, likely led to portfolio reallocations by global investors, which pushed down U.S. term premiums. In your next exhibit, panel 7 confirms that term premiums in U.S. and German bond yields have become increasingly correlated in recent years. Panel 8 focuses more directly on policy spillovers, showing how movements in German 10-year yields after ECB policy announcements appear to translate into movements in U.S. yields of about half that size.

So, how much has foreign QE lowered U.S. yields? Panel 9 illustrates some back-of-the-envelope calculations designed to get a handle on this question. First, we gauged the effect of asset purchases by the ECB, Bank of England, and the Bank of Japan, shown in column 1, on term premiums in those countries (column 3). We then translated those declines into effects on U.S. term premiums (column 5) based on pass-through estimates (shown in column 4) such as the ½ coefficient shown in panel 8 for the euro area. Summing up these effects, we calculate that the total cumulative effect of foreign asset purchases since 2008 on U.S. term premiums has been 71 basis points, the number in the bottom right of that panel; their effect since you first started raising rates in December 2015 (not shown) is estimated at around 30 basis points. These estimates are obviously extremely speculative, and I'm inclined to believe they're at the high end of the reasonable range, but at a minimum they support the view that foreign QE has had a material effect on U.S. yields. To put this in perspective, panel 10 compares the movement in U.S. 10-year yields (the solid line) with our estimate (the dashed line) of what U.S. yields would have been absent the downward pressure on term premiums coming from foreign asset purchases.

The eventual shrinking of AFE central bank balance sheets should lead to some reversal of the decline in term premiums abroad and thus some upward pressure on U.S. term premiums. However, as was indicated in panel 6 on the preceding page, our admittedly speculative projections of these foreign QE actions entail only gradual declines in the balance sheets of the Bank of England and ECB and no decline at all for the Bank of Japan. Accordingly, as shown in panel 11, which measures the cumulative downward pressure on U.S. term premiums from foreign QE, there is

little reversal of this effect through 2025, though the reversal could come sooner as markets learn about the normalization plans of the foreign central banks.

Finally, it is also possible that if and when AFE inflation is seen to pick up on a sustained basis and fears of downside risks to inflation and interest rates diminish, term premiums and yields abroad could jump, leading to corresponding increases in U.S. interest rates. As indicated in panel 12, we estimate that foreign term premiums have declined to very low levels, more than QE alone can account for. Should our baseline forecast materialize, a snapback seems plausible and would most likely affect U.S. rates as well.

I will now turn the discussion over to Beth to talk about financial stability.

MS. KLEE.[4] Thanks, Steve. My briefing will refer to the handout titled "Material for Briefing on Financial Stability Developments," and today I'll summarize our recent July QS assessment of the stability of the U.S. financial system.

As you may remember, our framework for evaluating financial stability suggests that in the absence of significant structural changes, we would expect, over long horizons, vulnerabilities to be in each of our five categories—which range from "subdued" to "elevated"—a roughly equal proportion of time. Against that backdrop, on balance, we continue to judge vulnerabilities in the U.S. financial system as "moderate." Vulnerabilities stemming from financial leverage as well as maturity and liquidity transformation appear low, and those from leverage in the nonfinancial sector appear moderate.

Since the April QS, however, Treasury yields have remained low, asset prices have continued to rise, spreads have narrowed further, and realized and implied volatility have been muted across a number of markets, as Simon highlighted. Taken together, these developments nudged our assessment of vulnerabilities due to asset valuation pressures from "notable" to "elevated"—or, in more colorful terms, from "orange" to "red." And while our assessment is judgmental, it is informed by empirical evidence pointing to a further rise in valuations this year. For example, the top panel on your first exhibit plots a composite index that summarizes asset valuation pressures and risk appetite for a number of markets. The estimated value of the index for the second quarter of this year is above the 90th percentile of its historical distribution.

The next few panels explore market-specific indicators. Implied and realized volatility have fallen to low levels in a number of markets, including those for Treasury securities, short-term money market instruments, and equities. Expected equity price volatility as measured by the VIX is at the bottom of its historical range and last week reached near-record lows. In order to provide a longer-term view, the middle-left panel illustrates the path of the VIX over three recent monetary policy tightening cycles, with the *x*-axis indicating the number of trading days since the first

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

rate increase. Overall, the pattern (and some staff analysis that looks at volatility cycles more carefully) suggests that low and declining volatility has been a feature of the expansionary periods over which the federal funds rate has been raised, implying that today's levels of equity market volatility may be consistent with the current state of the business cycle. Separately, some market observers have speculated that low levels of volatility may reflect growing use and trading of volatility-linked derivative instruments. While some trading strategies could, in principle, mechanically depress volatility, available indicators do not suggest that their current scale appears large enough to explain the recent decrease, nor has there been a major shift in capital to support such strategies.

As shown in the middle-right panel, since the April assessment, the high-yield corporate bond spread has narrowed and remained near the bottom of its range of the past 20 years. In addition, not shown, spreads on syndicated leveraged loans are at the lower end of historical ranges, but they are still notably above their levels just before the financial crisis. That said, some nonprice underwriting terms remain quite accommodative when compared with those in previous business cycles.

As shown in the bottom-left panel, capitalization rates—the ratio of a commercial property's income to its price—are near historical lows. Although the spreads, not shown, of these measures to yields on comparable-maturity Treasury securities are close to the middle of their respective distributions over the past two decades, spreads are currently closer to the lower ends of their ranges if we exclude the pre-crisis bubble.

As summarized to the right, in addition to these price-based measures of valuation pressures, we also monitor a range of nonprice measures for signs of "heat"—that is, signs of dramatically increased willingness to take risks. The deep junk share of corporate bond issuance is in line with history. Banks are tightening terms on CRE loans, and underwriting terms in newly issued CMBS pools have become more stringent. All of this together suggests that, while investors have bid up the prices of risky assets relative to benchmarks, they are still differentiating among levels of risk and have not yet succumbed to "irrational exuberance."

As discussed in your next exhibit, to the extent that high asset valuations relative to historical averages do reflect speculative "froth," they can lead to greater risk-taking behavior. One way the financial system may accommodate this risk appetite is by generating credit in various forms, both internal and external to the financial system. But so far, we judge that vulnerabilities associated with nonfinancial sector leverage remain moderate. As shown in the top panel, a summary measure, the credit-to-GDP ratio of the private nonfinancial sector, the green line, is well below its trend, the black line, although it is near levels seen in the run-up to the crisis. What does the current level of risk appetite mean for credit growth? The purple line and the associated confidence band plot a forecast of nonfinancial leverage that incorporates a summary measure of risk appetite. The trajectory suggests that the credit-to-GDP ratio is unlikely to rise above trend for at least another couple of years.

As has been the case for most of the post-crisis period, household debt continues to be well below its trend while business debt is above trend. Indeed, as shown in the middle-left panel, net business leverage continues to be at its highest levels since the start of the financial crisis, suggesting continued vulnerability among these firms. However, these debt levels peaked last year, showing through to declines in net leverage since then.

Vulnerabilities associated with financial leverage continue to be judged as "low." The banking sector is well capitalized: As shown in the middle-right panel, bank equity capital ratios are above fully phased-in regulatory benchmarks and are still edging higher at larger banks. And available indicators of leverage for nonbank financial institutions remained steady. For example, as shown in the bottom-left panel, respondents to the June Senior Credit Officer Opinion Survey on Dealer Financing Terms reported little change in use of leverage by hedge funds over the past three months.

And, finally, we continue to view vulnerabilities to the financial system stemming from maturity and liquidity transformation as low and little changed from the April assessment. As detailed in the bottom-right panel, the large banks subject to either the full or modified LCR standard hold historically high levels of liquid assets. In addition, nearly a year has passed since the largest flows related to the money fund reform occurred, and we have seen little evidence of worrisome increases in alternative money fund assets. Still, some maturity and liquidity transformation concerns remain, as insurance companies continue to boost their reliance on nontraditional liabilities, including FHLB advances, repo, and securities lending.

The last page of your handout is the QS heat map, which, for the most part, resembles the April version. Even with the uptick of valuation pressures to "elevated" reported in the first row, vulnerabilities stemming from leverage are "moderate" and those from maturity transformation are "low." Consequently, some of the conditions that would cause a rapid decline in asset prices to have adverse effects on the financial sector and impede its ability to function are not yet in place, and so, in our view, overall vulnerabilities remain moderate. Thank you. We'll all be happy to take your questions.

CHAIR YELLEN. Questions for any of our presenters? President Rosengren.

MR. ROSENGREN. I have a question on financial stability and your staff judgment on levels of vulnerabilities. As a kid I played "Red Light, Green Light." "Red light" meant stop, and "green light" meant go. In Boston, it's a little less clear. [Laughter] Neither the pedestrians nor people driving cars seem to have the same interpretation of what those colors mean. But I do note that you judge the valuation pressures to be elevated. And thinking about things that you

could do, you could vocalize concerns, you could tighten CRE guidance, you could think about countercyclical buffers, you could try to shrink a balance sheet faster or sooner. When you look at a "red" for financial stability valuation pressures, is there any action that is implied? And if there is an action, among the variety of things that you could possibly do, is there any prioritization the staff would use to think about that?

MS. KLEE. I think the first thing to remember is that the QS assessment is just an assessment. What we're trying to do is highlight what the staff views as the important vulnerabilities facing the financial system. I think that the regulatory framework we have in place, particularly in the banking sector, is resilient. As you saw, the maturity and the liquidity transformation experienced by banks is relatively low, or at least it's well capitalized. In terms of specific guidance, I believe that what we have in place is probably okay, although perhaps Andreas knows if there's something on the table.

MR. LEHNERT. I think the question is, what happens if these stretched valuations unwind abruptly, on the one hand, and what if they persist and elicit a binge of borrowing? We have focused a lot over the past few years on the consequences of big moves in asset prices across a variety of different asset classes. Among the major asset classes that we study, we are as confident as we can be that, we have traced through, to the extent possible, the consequences of those moves, and they don't seem beyond the normal accelerator dynamics. I think the premise of your question was that asset prices themselves might be an object of attention. I don't think that's necessarily right when you think about the second-round consequences of a big shift in asset prices. Then, on the borrowing side, as Beth showed, we think there aren't really signs of any kind of acceleration in people taking on debt at this point, and we suspect that we'll get plenty of warning should that come to pass.

VICE CHAIRMAN DUDLEY. I just have a two-hander. My understanding is that the "red" is just mechanical—if the evaluations are above *X*, it goes from "yellow" to "red." "Red" doesn't really have the same meaning as a red light.

MR. ROSENGREN. It's supposed to.

MR. LEHNERT. We're sticking with the framework that we set up several years ago, although, in retrospect, maybe this is one area we would have chosen something with a little less of a deep association with danger and so forth.

MR. ROSENGREN. Thank you.

CHAIR YELLEN. Governor Brainard.

MS. BRAINARD. Yes. That was a good question. I think there is a mapping from the overall assessment of vulnerabilities to the countercyclical capital buffer. We have put that out in a rule, and so you would expect that if you saw a pattern of red flashing lights it would call for the beginning of the countercyclical capital buffer to be built. In this case, the flashing red in the valuation pressures is strongly offset by some of the low judgments in the other categories, and that's, at least in my observation so far, why it hasn't mapped to the countercyclical capital buffer starting to be turned on, but that could change in coming months.

CHAIR YELLEN. Governor Fischer.

MR. FISCHER. The countercyclical capital buffer applies to the banks, right?

MR. LEHNERT. Yes.

MR. FISCHER. And where do we think the sources of these pressures are? From the banks, or what?

MR. LEHNERT. Presumably, the marginal investor purchasing one of these assets is paying above odds for it, and that marginal purchaser could be anywhere in the system. It

doesn't seem that he or she is using bank or actually any other debt financing to make that purchase.

MR. FISCHER. And when we intervened early in a leveraged lending case, were those only the firms we supervised, or was that more general?

MR. LEHNERT. No. The 2013 guidance applied to firms under U.S. federal supervision. This is a joint Fed–OCC action.

MR. FISCHER. So if we wanted to issue a more general warning or express our concerns—lift our little finger when we drink tea with them, or whatever the accepted formulae are—we'd have to get together with some other regulators. Is that right?

MR. LEHNERT. It depends. That was a specific expression of concern regarding a specific set of loans that were being made by that set of institutions. Presumably, it would depend on the facts and circumstances of the set of institutions that you are concerned about.

MR. FISCHER. Okay.

CHAIR YELLEN. Other questions? President Bullard.

MR. BULLARD. Thank you, Madam Chair. I'm looking at the International Outlook, exhibit 1, panel 4. This is the euro-area Phillips curve from 2000 to 2017. My question is, what is the natural rate of unemployment in Europe, and is it a time-varying object?

MR. KAMIN. Yes. We do our own analysis, but we also look at the OECD estimates. And so that is based on an OECD estimate of the natural rate of unemployment, which is actually relatively little time-varying. It falls a little bit over the course of the period from 2008 to the present. It has edged down about ½ percentage point at most and is a little bit under 9 percent. So that's the natural rate estimate for the euro area.

We have some skepticism about it, and we think that, in particular, because the estimate for Germany has fallen a lot, perhaps this estimate for the euro area should go down more than shows up in the OECD euro-area-wide estimate. Of course, if it were the case that we adjusted the euro-area-wide natural rate estimate to make it go down more than the series we're using, then that would actually make the conundrum even more difficult. I'm sorry, that goes the other way. So, yes, if the natural rate were actually lower, that would help explain a bit of it.

MR. BULLARD. I mean, isn't it shocking that we would say that a big economy like Europe has a 9 percent natural rate of unemployment?

MR. KAMIN. It is shocking.

MR. BULLARD. And the United States has a 5 percent natural rate? 400 basis points.

MR. KAMIN. Well, let's put it this way. It's shocking from the standpoint that a major part of the world's economy has a natural rate that large. Even if you adjusted it down to 8 or 7 percent, that's still a very high natural rate. In terms of why it might be so high, we think that that is explained by a legacy of quite a few labor market practices and structural features that support a high natural rate. But that's still a disappointing feature.

MR. BULLARD. Another question you could ask is, is inflation in Spain very different from inflation in Germany, in light of the fact that Spanish unemployment is double-digit and the German unemployment rate is low?

MR. KAMIN. It is different. It is lower. But what you'd call the cross-sectional Phillips curve—in other words, the differences between inflation and unemployment in Germany compared with in Spain and other countries—is not very steep. That is, in some sense, another way to pose the issue that Paul Wood posed in his briefing last week, which is that,

notwithstanding incredibly low unemployment in Germany, its inflation is not all that much higher than the euro-area average.

MR. BULLARD. Thank you.

CHAIR YELLEN. Other questions? [No response] Okay. Seeing none, we now have an opportunity for people to comment on financial stability. A number of people have asked to do so. Let's start with the Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you, Madam Chair. I have a few brief thoughts on the issue of financial asset valuation. I agree with the staff, of course, that the valuations are high. As I indicated by my previous comments, I'm not particularly worried that we happen to be in "red" territory. In particular, the facts that stock prices are high and credit spreads are narrow seem, to me, to be supported by an environment in which the economy has been growing at a relatively steady pace and the global economic outlook has been improving. And this has been happening at a time when the risk of recession seemed to be quite low. So low volatility in the real economy should be expected to translate into low volatility in financial markets, and this in turn might be expected to lead to low risk premiums and valuations that are high by historical standards. I'd be more concerned if the fundamentals were clearly inconsistent with the valuation metrics, or if the valuations were, as the staff suggested, accompanied by speculative mania or supported by high levels of leverage.

In terms of valuation, I guess I spend most of my time worrying more about valuation in the market for Treasury securities than about equity market valuation. The equity risk premiums are somewhat low compared with historical experience, but not unusually so. In contrast, the 10-year Treasury yield of about 2¼ percent is quite surprising at a time when we're close to full employment and are removing monetary policy accommodation. The staff memo on the low

level of long-term rates explores this, with depressed term premiums being the major explanation. In my mind, at least, depressed term premiums are another name for overvaluation.

Finally, I appreciate the efforts of the staff to explore the issue of the low level of volatility in the equity market and whether this is potentially encouraging behaviors that create significant financial stability risk. I generally agree with the staff's conclusions in the memo. But I want to add that there might be an additional avenue by which low volatility increases financial stability risk that goes beyond what was considered in that memo. That's the notion that lower stock market volatility may cause investors to increase their long exposures in the equity market. Parenthetically, this issue has been raised by Frank Brosens, who is a principal at the hedge fund Taconic Capital Partners. If you want to read about it, it has been highlighted in some of the recent issues of *Grant's Interest Rate Observer*.

The way it works is, if investors have a risk budget and volatility is low, then they can take on larger equity risk positions before that risk budget is exhausted. By itself, that doesn't seem to be particularly troublesome, because you would expect people could take on bigger positions if risk was low. But consider that if the long equity exposures are growing as volatility is falling, this would tend to push the equity market higher, which in turn would tend to damp stock market volatility. That's because equity market volatility tends to be directional—low when the stock market is rising and high when the stock market is declining. This raises a question of whether this all could unwind relatively quickly. Think of the use of portfolio insurance at the time of the 1987 stock market crash. Some external shock causes the equity market to decline. This leads to a rise in volatility, which forces investors following this strategy to reduce their equity exposures, pushing down equity prices in turn and so pushing volatility up

further. In principle, this could lead to a self-reinforcing dynamic on the downside. Now, the key question, of course, is how large such volatility-driven positioning is in the equity market.

We raised this issue in New York at a recent meeting of our buy-side advisory group. Perhaps reassuringly, or perhaps not, the members of the group were not concerned about this. My sense was that they did not view this type of strategy as very prevalent, and they thought that memories of the crisis were still limiting how far investors would take this, in terms of reacting to declines in volatility by raising their equity exposure. Also, my sense was that they thought that there were other, better explanations to explain the level of equity market valuation than people chasing the lower volatility higher. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. The Financial Stability Committee met yesterday and discussed recent trends in commercial real estate, an area highlighted in the financial stability report as part of the evaluated valuation pressure. Two primary areas were covered. First, medium-sized banks in particular are continuing to increase exposures to commercial real estate despite deals that imply historically low capitalization rates. It is worth recalling that banks exceeded CRE guidance in the last recession and experienced very high fail rates, raising the issue of whether additional supervisory actions may be warranted. Second, valuations in the multifamily segment are particularly elevated. This is a segment in which the GSEs have been quite active. This observation may highlight the importance of pushing even harder for GSE reform that considers potential fallout for the multifamily commercial real estate sector. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Fischer.

MR. FISCHER. Thank you, Madam Chair. The big news in the most recent assessment of financial stability is the judgment that asset prices are, for the first time in the short history of the QS, flashing red. Of course, as the staff have pointed out, this is not as yet a particularly worrisome development, nor is it unexpected. After several years of solid, if unspectacular, economic growth and no recession in sight, we would expect investors to be willing to accept risk at relatively low prices. One might wonder if this confidence is misplaced, and particularly whether the current low level of the expected volatility might be a sign of deeper problems, which is an issue to which I will return.

This is actually the second time in the current recovery that asset prices have shown preliminary signs of potential exuberance, as can be seen in the first chart in Beth's presentation. The first episode ended in 2015 after oil prices had peaked. Concerns associated with the subsequent decline and broader worries about global economic growth led to a series of accelerating declines in various asset prices in 2015 and 2016. By now, investors seem to have fully recovered their earlier enthusiasm and are once again flying, or at least until recently were accelerating, down the runways.

In the pre-crisis episode, high and rising asset prices stimulated an erosion of lending standards and a credit boom, particularly among shadow banks. This time around, banks appear not to be increasing their risk-taking materially, perhaps because of the post-crisis regulatory regime, particularly stress testing and tougher capital regulations. The natural concern is that nonbank institutions will be prepared to supply riskier credit than the banks. But as Beth showed, this doesn't seem to be happening. Commercial real estate loans packaged into securitizations have seen falling loan-to-value ratios and other signs of sensible risk management. Some lending practices in the leveraged syndicated loan market remain

worrisome, but conditions are still less "frothy" than before banks implemented the 2013 leveraged lending guidance, and issuance of the riskiest corporate bonds remains subdued.

Indeed, total credit to households and businesses has grown at most a little faster than income for three years now and shows no sign of accelerating. To be sure, the rapid increase in business credit early in the recovery has left the riskiest firms quite leveraged and, hence, more vulnerable to shocks. Although debt growth has been sluggish since 2015, the revival in asset prices over the past year or so suggests we ought to be on watch for a reacceleration of borrowing in this sector.

While the financial system is well placed to absorb large drops in asset prices or other shocks, and because banks' loss-absorbing capacities are substantially higher than in the pre-crisis environment—and those large standalone investment banks that survived the crisis have come inside the perimeter of bank regulation—a period of consolidation and reconsideration of the post-crisis regulations is now perfectly reasonable. But any erosion of the core reforms—capital, liquidity, stress testing, or resolution—would leave us with a financial system that is potentially less transparent and more vulnerable.

Now, to return to the issue of volatility. Robert Shiller won the Nobel Prize for showing that stock market volatility had been too high, whereas now we are concerned that it is too low. However, there is no simple variance inequality that would definitively establish that the financial markets are underpricing risk. Rather, the concern over the low level of market volatility arose from the combination of historically low levels of expected volatility, as derived from prices of options on the VIX, coupled with anecdotes of increasing numbers of traders effectively betting that volatility would stay low or decline. This is the process that Vice Chairman Dudley was describing. This could lead to a downward spiral in which falling

volatility begets further decreases in volatility. If traders pursuing these strategies are taking on more and more leverage, the day will come when market players realize that the process has gone too far and seek to move out of their positions, thus creating big losses hitting simultaneously across the financial system.

The staff looked into this possibility to the best of their ability and concluded that it is indeed possible that such an effect could occur, but that the magnitudes of trading involved at present are too small to produce the decreases we have seen. And, further, there is little evidence of capital flowing into these strategies in recent quarters. From what we can tell, there has not been an appreciable increase in the leverage behind these strategies. But, of course, this is the kind of dynamic that is, on occasion, only clear in hindsight, and those occasions are usually painful ones. Hence, we need to keep watching, worrying, and issuing warnings when we believe the process has gone too far. I suggest we keep digging, and that we do not refrain from issuing warnings when we believe they are needed and taking action, if we have any that we can take, when we believe that is needed and possible.

That said, the current low levels of actual and expected volatility are consistent with an overall increase in the desire of market participants to take on risk. The feedback loop at work here is much more familiar. Rising asset prices lead to improvements in traders' and financial institutions' balance sheets, which lead them to take on more risk, and so on. With that in mind, it is a good sign that participants acknowledge the risks of big price declines by, for example, demanding lower LTVs on commercial real estate loans in CMBS pools. Further, our stress tests try to limit the inevitable procyclicality of the financial system by becoming tougher in good times. In theory, the system is now designed to limit the spillover effects of a big drop in asset prices. Although we have seen some episodes of stress in the past couple of years, the system

has, however, yet to face its really big test. That will also be a really big test for us. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Madam Chair. I think my comments will be very consistent with what has already been said. Low cap rates and high P/Es are, in my view, very much a function of very low 5-to-10-year interest rates. The fact is, market psychology is now that rates will be lower for much longer than had been anticipated, and I think that psychology is becoming more strongly embedded in the markets. Also embedded is a presumption that this expansion is sustainable because it has been fueled mainly by growth in income rather than by leverage. So it has inherent sustainability, particularly because of the strength of the household sector.

The effect of that, though—from what I hear anecdotally and as Vice Chairman Dudley said—is that among institutions, particularly foundations, endowments, and pension funds, this risk-budgeting approach is certainly much more prevalent than it was before. We used to have a model that was called the "policy portfolio," and many institutions, including one at which I used to be, are now migrating toward a risk budget instead of a policy portfolio. And, low volatility, as the Vice Chair and Frank Brosens have pointed out, is a very key element of that. So I do think we have to be on guard for either a buildup of leverage or for a buildup in risk without leverage that might occur in certain asset classes that are currently liquid but could become substantially illiquid in a selloff. I think that is probably a bigger risk.

I think these conditions that exist right now are likely to persist for some time, which is why I am glad that we are starting to unwind our own balance sheet. I would not be sorry to see the ECB and other central banks also begin to unwind their balance sheets. But I also believe, as has already been said, that it is critical that we keep strong macroprudential policies for big

banks and SIFIs and we carefully monitor the shadow system. For example, I would be loath to see stress testing for big banks and SIFIs go to every other year versus every year. I think that would be a move in the wrong direction and a dangerous step that I would not like to see us make. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President George.

MS. GEORGE. Thank you, Madam Chair. My comments focus on the vulnerabilities associated with leverage in the financial sector as well as maturity and liquidity transformation risk. Although the staff shading of these vulnerabilities is unchanged from the previous report, my own sense is that the foundation for these assessments could be shifting in ways that bear close monitoring.

Recent estimates of the economy’s ability to withstand a significant negative shock to the financial system are reliant on the current quantity and quality of capital held by the U.S. banking system. Indeed, this most recent QS report cites bank capital positions as a key factor for the current low risk assessment of financial-sector leverage. Since the previous QS report, however, there’s been continued pressure from the industry to reduce capital requirements, and the potential for regulatory accommodation of lower requirements has surfaced. And with the release of the CCAR results last month, the largest banks have announced plans to pay out substantially higher fractions of their earnings over the next year, and investors expect that to continue.

Research suggests that after the transition to higher capital requirements, better-capitalized banks experience lower debt funding costs and faster loan growth. These dynamics should lead to greater economic growth and more effective monetary policy transmission. We should expect that a well-capitalized banking system that can withstand shocks accrues longer-

term economic benefits in the form of a less severe and, therefore, less costly financial crises. Because of that, we should be mindful that if current efforts to reduce existing capital stocks are successful, the financial stability outlook could deteriorate.

Regarding vulnerabilities associated with maturity and liquidity transformation, I continue to hear from our insurance contacts in the region about pressures on their traditional business model that have led to new strategies. For example, nontraditional liabilities and securities lending at insurance companies continues to increase, marking one area of concern. This movement away from longer-term, stable sources of funding to greater reliance on short-term and alternative funding instruments, including those offered by Federal Home Loan Banks, should be carefully monitored. Indeed, maturity transformation risk appears to be migrating from money markets to the Federal Home Loan Bank System. Thank you.

CHAIR YELLEN. Thank you. President Kashkari.

MR. KASHKARI. Thank you, Madam Chair. This QS report with the flashing red highlighted for me that I, for one, don't have great clarity on the Committee's reaction function as it relates to financial stability. I think it relates to what some others asked about: What would we need to see in this chart for us to take action? And then what actions would we take, and what are the tradeoffs associated with them?

When I think about it, there's the countercyclical capital buffer, there are other types of guidance, and in the public there's some speculation about whether we would raise rates if we're concerned about asset prices. Then there become tradeoffs against achievement of our dual-mandate goals, and I don't have a good framework for thinking about how we trade off these various different objectives. So I would welcome having either the staff or we as a Committee more formally taking this on. We would be preparing now for what we would do if we saw these

different lights—what actions would be taken, and what the tradeoffs are. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Brainard.

MS. BRAINARD. Thank you. As Governor Fischer noted, valuation pressures are flashing red for the first time since the quarterly judgmental assessment was introduced three years ago. This assessment is coupled with a deep dive into possible unwind and amplification risks associated with the exceptionally low levels of realized and implied volatility we've seen across asset classes in recent months, a topic that's been prominent in my recent discussions with market participants. Overall, however, financial stability risks continue to be assessed as moderate in light of low financial-sector leverage and maturity transformation and leverage in the nonfinancial sector that is now moderate.

So what does that mean for monetary policy? There's an important distinction between deploying monetary policy in the service of financial stability and recognizing financial conditions as important considerations in calibrating monetary policy settings. The kind of valuation pressures we're seeing today can be expected to boost investment and spending, and if such a boost were to come at a time when it could overstimulate the economy and contribute to excessive inflation, the dual mandate would call for tighter monetary policy.

Recognizing that we'll return to policy deliberations tomorrow, I simply want to note that I support a change to our reinvestment policy at the next meeting if economic conditions evolve as we expect. As that runoff gets under way, I'll want to monitor financial conditions closely for signs that the expected tightening in long yields is, in fact, taking place. Of course, as we heard earlier, one important determinant will be whether central banks in other major economies maintain accommodation, which could continue to offset the expected tightening here or instead

begin to reinforce our tightening, depending on the nature and timing of their normalization strategies.

Let me turn from the question of financial conditions to financial stability. We did have a discussion of this topic in April 2016, and I just want to review what we said at that time. Most participants viewed the benefits of using monetary policy to address threats to financial stability as typically being outweighed by the associated costs in terms of deviations from our dual-mandate goals, but, of course, there were exceptions to that. The question today is whether the elevated valuation pressures pose a sufficient risk of financial crisis in the future to merit monetary policy departing from what would otherwise—according to our dual-mandate considerations—be the appropriate path.

I certainly share the concerns that valuation pressures are flashing red, but I don't believe that test is close to being met today. Instead, I think we, and the Board in particular, need to be very active and vigilant in carrying out our financial stability and supervisory responsibilities through macroprudential and microprudential policies, communication, and guidance.

If we look at what we have seen historically, asset bubbles pose much greater risk to the economy when they are supported by high leverage. So if we look across the analysis in the quarterly assessment, it's notable that the valuation pressures are greatest in the equity markets, in which we traditionally have not seen as much association with leverage, and lowest for housing, the sector that has been the biggest problem in the past. Besides equity valuations, valuation pressures in commercial real estate are also raising red flags, as President Rosengren mentioned earlier, and that is a sector that typically is associated with leverage here. With regard to the portion of the financing of CRE held directly on the books of regulated financial institutions, the guidance that we issued earlier and subsequent supervisory efforts appear to have

had an important influence on the tightening of underwriting standards reported by the large systemic institutions. But smaller institutions continue to evidence large concentrations of exposure, which may pose safety and soundness—although less likely to be financial stability—risks. But with prices remaining elevated, we need to remain vigilant that institutions don't become overly exposed to indirect channels as well as through direct lending.

The quantitative assessment report suggests the concerns about elevated asset prices are balanced by robust capital buffers, as President George was discussing earlier. Of course, those high capital levels and low levels of maturity transformation are not there by accident. They reflect strong risk-based capital requirements, liquidity rules, resolvability requirements, and changes to money market funds, all of which have been instrumental in bringing these about.

Additional guidance, as well as communications and a supervisory stress test on an annual basis as well as the countercyclical capital buffer also provide scope for reinforcing these safeguards if necessary. But as memories of the crisis fade, public support for these safeguards appears to be doing the same. Efforts to soften standards could contribute to the cyclicality of the financial system, and it's precisely when asset prices are high that future losses are also most likely to be high and the loss-absorbing capacity of adequate capital buffers becomes most important. So we need to remain vigilant, publicly highlight financial risks in areas in which we see them building, and steadfastly carry out our prudential responsibilities. Thank you, Madam Chair.

CHAIR YELLEN. Thank you very much. Is there anybody else who would like to comment on financial stability? [No response] Okay. Why don't we start our economic go-round. We'll have a few people, and then we'll take a coffee break. Let's begin with President Mester.

MS. MESTER. Thank you, Madam Chair. Contacts in the Fourth District continue to report that conditions are improving at a moderate pace. In July, the Federal Reserve Bank of Cleveland staff's diffusion index, which measures the percentage of business contacts reporting better versus worse conditions, edged up 3 points to 28, which is above the readings over last year. Construction-sector contacts remain upbeat, but auto contacts report a softening in the motor vehicle sector, which has a bigger footprint in the Fourth District compared with the nation. One of my directors, an auto industry executive, reports that as auto sales have slowed, automakers are trimming production. But they're also taking advantage of that slowdown to accelerate their retooling of plants in response to the shift in demand from passenger cars to light trucks, which include SUVs. Although motor vehicle companies are increasing incentives, they're being more disciplined than they have been in the past with respect to both incentives and fleet sales. But the director also says it remains to be seen whether this discipline will continue if sales decline further.

Conditions in District labor markets continue to be strong, with above-trend payroll growth. The unemployment rate has been stable at 5 percent over the past two years. Staffing firms report that demand for their services has increased over the past two months. Contacts continue to report more broad-based upward pressure on wages, but price pressures remain subdued.

At our previous meeting, I reported that District contacts thought that the confidence showed earlier in the year in many sectors had tempered to optimism. Since our previous meeting, more District contacts are reporting that mounting political and fiscal policy uncertainty is beginning to weigh on hiring, spending, and investment decisions of some firms and customers. In most sectors, the outlook remains positive overall, but some firms are reacting to

the uncertainty by putting some of their plans on hold. The uncertainty over changes in the health insurance system continues to weigh on the health-care industry and its suppliers. A director who leads a large workforce development agency is anticipating cuts in funding, on the basis of the Administration's budget proposal. So even though demand for their services is up and there's considerable uncertainty about what a final budget would look like, the agency is actively planning for staff reductions so it can smooth them out over time. It seems to me that we're going to be living with uncertainty on the fiscal side for some time. It remains to be seen how firms and households will adjust to that reality. We'll need to keep watch on this, whether this is a temporary pause or develops into something longer lasting.

Regarding the national economy, economic conditions remain broadly in line with my medium-run outlook of growth at or above trend, continued strength in labor markets, and inflation gradually rising back to 2 percent on a sustained basis. Incoming information is consistent with the pickup in economic growth in the second quarter. While retail sales were soft, fundamentals supporting consumer spending remain sound, and business investment has accelerated from last year.

Labor market conditions remain strong, with payroll growth well above trend and the unemployment rate below estimates of its longer-run level. Payroll growth over the past three months has averaged 194,000 jobs per month, up from 166,000 per month over the first three months of the year and 187,000 per month last year. The unemployment rate is 4.4 percent, matching its lowest level over the previous expansion. We haven't seen an acceleration in wages this year, but wages have accelerated since 2013. The subdued acceleration in wages is consistent with the low productivity growth we've seen over the expansion.

The real question is, what's happening with inflation? Total PCE inflation is up from year-ago levels, but the year-over-year reading was 1.4 percent in May, lower than it was earlier this year. Core PCE inflation also stood at 1.4 percent in May. Now, some of the weakness reflects some special factors, including drops in the prices of cell phone service plans in March and the prices of prescription drugs in April. These effects are likely transitory, but they'll put downward pressure on inflation in the near term.

Regardless of the reason for the low inflation readings, the fact that the inflation measures have been underrunning our 2 percent goal for quite some time is not without risk, as it has the potential to destabilize inflation expectations. So far this hasn't happened. Longer-run inflation expectations remain reasonably stable. The University of Michigan's 5-to-10-year-ahead median inflation expectations measure has edged up over the past three months. The New York Federal Reserve's median 3-year-ahead inflation expectations measure has moved back up to levels seen earlier in the year. Consensus Economics's 6-to-10-year-ahead CPI inflation forecast has been stable from April to July. And the Federal Reserve Bank of Cleveland's model-based 5-year-forward, 5-year inflation expectations measure has been essentially unchanged since December.

With inflation expectations reasonably stable, labor market strength continuing, and the economy growing at a moderate pace, I continue to project that inflation will rise gradually over time to our 2 percent goal on a sustained basis. Of course, inflation is difficult to forecast. Some might be tempted to think we should abandon our forecast and just look at current inflation as an indicator of the underlining inflation trend. This would be a mistake. My staff's analysis indicates that since the early 1990s, the most recent year's core or headline inflation by itself hasn't had much value for predicting inflation one year ahead. The staff found that the adjusted

R^2 of the regression of headline inflation over the next four quarters on either headline or core inflation over the most recent four quarters has been consistently zero since the 1990s. In other words, current inflation alone has had no explanatory power for future inflation since the early 1990s. In out-of-sample forecasting exercises with real-time data, this random walk–type forecast is no more accurate in terms of its root mean squared error than a constant forecast of 2 percent.

The Board staff's helpful background memo on inflation highlighted the fact that our models of inflation are still quite limited, and that most of the variation in inflation comes from unexplained shocks to inflation itself. This means we need to remember there's considerable risk to any inflation forecast—risk both to the downside and to the upside. I think the FOMC statement has it about right. We need to continue to monitor inflation developments closely. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. The Tealbook has the unemployment rate at 4 percent and PCE inflation at 1.9 percent at the end of 2018, with the funds rate rising above 2 percent by that point. That modal outlook seems reasonable to me, under the policy assumption. But in my view, as I emphasized at the previous FOMC meeting, the Tealbook forecast suggests we need even more aggressive tightening than is assumed in the Tealbook, as the forecast perceives unemployment well below the natural rate even as inflation reaches target. But even if one doesn't view the Tealbook modal forecast as sufficient to provoke a more aggressive policy response, I want to consider whether there are second-moment considerations that we should ensure against.

On the downside, one possible concern could be that we will continue to undershoot our 2 percent inflation target. Because we have been undershooting our target for some time, it is certainly possible that longer-run inflation expectations have settled somewhat below 2 percent, as assumed by the Tealbook. Whether this is likely to develop into a persistent miss of our target depends, in part, on whether the recent undershooting of inflation is due to a series of transitory factors, in which case tight labor markets and well-anchored expectations will ultimately drive inflation to our target. In fact, most of our June SEP submissions were consistent with current low inflation rates being transitory—although we have, of course, received additional information since those submissions.

The current 12-month inflation rate for both PCE and core PCE is estimated to be 1.4 percent. In our most recent SEP submissions, the median forecast of core and total PCE inflation in 2018 was 2 percent. No participant expected 1.4 percent inflation to persist. The lowest estimate for both PCE and core PCE inflation was 1.7 percent. While the lowest estimate remains a bit below target, it is still consistent with interpreting the recent readings as a temporary anomaly. Such an interpretation of the data likely continues to hold when taking into account the information on prices that we have received since the June meeting. The current Tealbook has incorporated the June CPI release into its outlook, and, like my staff, it views the recent low inflation readings as unlikely to persist. The Blue Chip forecast of CPI inflation tells a similar story. The consensus forecast is for CPI inflation at the end of 2018 to be 2.3 percent, roughly consistent with our target, taking into account the normal spread between the CPI and PCE inflation measures. Thus, as of this meeting, several forecasts by both market and FOMC participants remain consistent in viewing the current very low inflation readings as likely to be transitory.

The case for taking out insurance against low inflation would be strong if the unemployment rate were likely to level off at or near estimates of full employment. However, the Tealbook, forecasts made by my own staff, the Blue Chip, and the June SEP all expect the unemployment rate to fall below the Committee's median estimate of full employment for the next several years. These unemployment rate forecasts are consistent with most GDP forecasts being a bit above 2 percent, which exceeds most people's sub–2 percent estimate of potential. As a result, most forecasts expect continued declines in the unemployment rate from already low levels.

Looking at the risks associated with my modal GDP forecast, should real GDP be a bit weaker than currently expected—say, 1¾ percent—unemployment would level off at a rate below our estimate of the natural rate, still placing upward pressure on inflation. However, if real GDP grows a bit faster than expected, it is quite possible to have unemployment rates below 4 percent by next year. The very real possibility of very low unemployment highlights a risk of taking out the insurance policy against continued low inflation. While there is, of course, uncertainty about the current level of the natural rate, it is unlikely that it is below 4 percent. While we all must confess to uncertainty about how inflation works in low-inflation environments, it still seems quite risky to me to bet on quiescent inflation with a sub-4 percent unemployment rate. Even if we are currently operating on a relatively flat segment of the Phillips curve, such a pronounced undershooting of the natural rate risks an eventual overshooting of our inflation target. And with a relatively flat Phillips curve, returning inflation to target from above would require us to create a significant slowing in the economy. Thus, I would not characterize reaching such a low unemployment rate as forecast by the Tealbook as simply probing.

A modest increase in inflation as unemployment falls well below the natural rate may not be especially costly in itself, but it will make evident the overshoot of full employment, which will imply further gradual increases in inflation, both of which the FOMC will need to correct. On the basis of past experience, I fear that such a correction will be costly, and that it will likely entail a recession, rather than a smooth convergence to the higher level of unemployment consistent with equilibrium.

While it can be argued that the Phillips curve has not generated much inflation to date, we are now only in the second quarter in which the unemployment rate has averaged below the Committee's median estimate of full employment. A hallmark of monetary policy is long and variable lags. And if the Tealbook and most other forecasts are right, we will be persistently below full employment for some time. Because it is unlikely that the Phillips curve will remain flat no matter how low the unemployment rate gets, we might want to ensure against the possibility that such a test is conducted very far from our best estimate of the natural rate. I'm looking hard for the bright side here, but I suppose econometricians might rejoice, as this will present an opportunity to determine more precisely the shape of the Phillips curve at very low unemployment rates.

In summary, inflation undershooting appears to be a transitory phenomenon—a view that is corroborated by most inflation forecasts. But a sub-natural unemployment rate quite likely will not be transitory. If we want to adequately ensure against this risk, we will need to continue to steadily remove accommodation. Because this risk looms even larger, we may consider making our policy decisions less sensitive to the modest, likely transitory shocks that we will no doubt experience in coming months. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Brainard.

MS. BRAINARD. Thank you, Madam Chair. The economy remains on track against the backdrop of a brighter global outlook and loose financial conditions. I'm heartened to see more prime-age Americans engaged in productive employment, but I'm struck by the disconnect between signs that the economy is in the neighborhood of full employment and indications that the tentative progress we have seen on inflation may have stalled.

Recent labor market readings indicate continued growth over the past three months. Nonfarm payrolls have increased upwards of 190,000 per month, and private payroll growth has been about the same as last year. The employment-to-population ratio for prime-age workers has improved, although it's still 1½ percentage points lower than pre-crisis. Disaggregating the headline numbers, as we heard earlier, unemployment rates for minority groups have been coming down more sharply than the overall average in recent months, showing ongoing progress among groups that typically have the most room to grow. These are welcome developments.

Although the latest reading on retail sales was on the soft side, the fundamentals underlying consumer spending remain very strong. Furthermore, business investment in equipment and structures looks set to post decent increases this year after being flat last year, and the contribution of net exports appears set to be neutral overall. By contrast, my expectation is now for much smaller and somewhat later fiscal stimulus than I had originally anticipated. This has important implications for my forecast.

Economic developments abroad, as we heard, have been positive, with foreign economies posting robust real GDP growth so far this year. And in recent weeks we've begun to hear statements suggesting we may see a turning point before too long when central banks in several major economies start to normalize monetary policy, in many cases through actions on their

balance sheets as well as through policy rates. This could have important implications for term premiums and long yields in the United States, depending on the timing and approach.

In line with this mix of developments on the fiscal and foreign fronts, the dollar has depreciated a bit on a trade-weighted basis. In addition, the prospect of reduced purchases of longer-term assets by foreign central banks has likely spilled over into increased term premiums for U.S. assets, and equity valuations have continued to strengthen, so that, on net, financial conditions haven't changed much but remain quite loose.

Despite this benign picture for domestic activity, both overall and core PCE prices are estimated to have risen 1.4 percent for the year through June, well short of our objective. And, of course, the slowdown of progress on inflation comes against the backdrop of five straight years of undershooting our target. The staff analysis concludes that temporary factors are pushing down inflation this year perhaps by a bit more than ¼ percentage point, roughly the same magnitude by which temporary factors boosted inflation by a similar amount last year. It concludes there's little reason to take much signal from either, and fair enough. But the decline occurs against the backdrop of a sustained shortfall of inflation from our target despite a sharp improvement in resource utilization. Over the past three years, unemployment has averaged roughly 5 percent. That's comparable with the 12 quarters between 2004 and early 2007, before the run-up in unemployment associated with the crisis.

Despite the same degree of slack, core inflation averaged 2.2 percent during that period, considerably higher than today's three-year average inflation rate of 1.5 percent. So why is inflation so much lower now than it was previously? The staff memo presents a number of estimates of underlying or trend inflation, which is similar in concept to the inflation attractor that seems to anchor the rate of inflation over fairly long horizons. Most of the estimates it

presents are below 2 percent and suggest that underlying inflation is likely lower now than it was before the crisis. That's suggested by estimates based on time-series models, longer-run expectations given in the Michigan survey, and five-year-forward TIPS-based inflation compensation. The evidence suggests an important reason inflation has been lower in the past few years than in the pre-crisis period is thus this lower level of underlying inflation.

The staff estimate takes about 1¾ percent as its estimate of underlying inflation, which seems like a reasonable midpoint for these estimates. Despite this low underlying level, the Tealbook forecast sees core inflation rising to 1.9 percent next year and hitting our target in 2019, which of course is a critical factor in the baseline policy path. Two key assumptions drive that increase. The first is resource utilization, which pushes inflation up about 0.15 percentage point by 2019. There are, of course, reasons to worry that resource utilization might not contribute as much as assumed in the forecast. It is possible the unemployment rate will not fall as steeply as in the forecast. And, second, there may be less of an effect from resource utilization if the natural rate is lower than the Tealbook assumes. But just as importantly, the forecast sees that underlying rate of inflation increasing to 1.85 percent next year and 1.9 percent the year after. This is a judgmental estimate, as I understand it, rather than one derived from any particular empirical or theoretical foundation. Without this assumption, the underlying estimate wouldn't achieve the return of inflation to our target in the medium term, even with the increases in resource utilization that are assumed.

So the analysis underscores, at least to me, that it's imperative to raise longer-term inflation expectations if we're to achieve our target. The key question in my mind is, how do we do that? Of course, there's no completely satisfying diagnosis of why underlying expectations may be falling short of our objective. That said, one plausible contributing factor may be the

greater proximity to the effective lower bound due to the lower neutral rate, which increases the likely frequency of periods of below-trend inflation. Whether or not this is the correct diagnosis, it is critically important to do what we can to guide inflation back up to around our symmetric target. The persistent failure to meet our inflation objective should be leading us to cast a wide net in terms of both diagnoses and solutions. For this reason, I'll want to assess inflation developments closely before making a determination on further adjustments to the funds rate—a subject, of course, that we will return to in the future. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Williams.

MR. WILLIAMS. Thank you, Madam Chair. Since our June meeting, the key spending data have met expectations, and they confirm that the economy has rebounded in recent months and the expansion remains on track. I expect real GDP to grow a touch above 2 percent this year, on par with the average that we've seen over the past several years. And, as I discussed at our previous meeting, given the trends in demographics and productivity, I estimate that potential GDP is growing only about 1½ percent per year. Against that benchmark, the current pace of economic growth is actually quite strong and exceeds, by a sizable margin, its sustainable trend.

Labor market performance has also remained solid in recent months and has generally surprised to the upside. So far this year employment has increased, on average, about 180,000 jobs per month. And as Governor Brainard mentioned, the pace of job growth in the private sector has been very good, about the same as last year. Relative to population demographic trends, this robust pace is also unsustainably high. Furthermore, job gains show few signs of slowing down, despite the fact that the unemployment rate is already below the

consensus range of estimates for the natural rate. A variety of other indicators also point to a labor market that has exceeded full employment.

All of this evidence of a very healthy labor market naturally raises the question of why wage growth has not returned to the rates that we typically associate with a strong labor market or a labor market at peak. On that question, I'll emphasize two points. First, in relation to recent weak productivity gains and low price inflation, nominal wage growth really isn't that slow, especially after factoring in the usual lags between labor market tightness and wage growth. This conclusion is consistent with the evidence obtained from the wage models that were presented by the staff before the June meeting.

Second, measures of wage growth continue to be held down by changes in workforce composition associated with demographics and a strong labor market. As the labor markets continue to strengthen, many workers previously on the sidelines of the labor force or in part-time positions have been moving into full-time employment. The vast majority of these new workers earn less than the typical full-time employee, so their entry brings down the average wage. It's just a matter of arithmetic.

Updated calculations by my staff show that this compositional effect continues to hold down growth in the median weekly earnings measure by a little more than a full percentage point—a sizable effect relative to the normal expected gains. Digging a little deeper into this compositional effect and leveraging the earlier work on the nonemployment index, or NEI, developed in conjunction with the Federal Reserve Bank of Richmond staff, my staff confirms that new hires are increasingly coming from groups that traditionally have low labor force attachment—again, a common feature of a very strong labor market. The shift toward groups

with low attachment likely underlies the negative composition effect that's suppressing wage gains.

On balance, I view these developments as consistent with a labor market that is starting to strain its capacity. I remain confident that such excess demand will push up inflation toward our 2 percent target. There is no doubt that the recent price data have been disappointing, but they have been pushed down by several identifiable transitory factors. In the second half of this year, I'm confident that we will be getting back to monthly inflation readings with an upward tilt that's indicative of greater underlying pressures.

Now let me turn to an assessment of financial conditions, which is a crucial backdrop for the forecast. Here I want to make the point that a declining *r**—the longer-run value of the real funds rate—is important for interpreting movements in asset prices and in calculating the wealth effect from these movements. As I mentioned at our previous meeting, I lowered my own estimate of *r** to ½ percent. This change reflected both persistently low estimates from many macro models, including my own, as well as more recent evidence using term structure models. The latest Tealbook forecast has also adopted the same lower *r**, and the special Board staff memo provides an excellent—indeed, insightful—review of the relevant literature.

In light of the term-structure evidence, it's reasonable to assume that a very low *r** is being priced into financial markets and the associated asset valuations that have been the subject of a lot of our conversation today. In that regard, a separate Board staff memo on longer-term interest rates makes a good case that a low *r** could partly explain why longer-term Treasury rates have changed so little, on net, since we began raising the federal funds rate target.

Similarly, a low *r** should push up prices across a range of assets, including equities, corporate bonds, and commercial and residential real estate. In doing so, it can account for a

good portion of the apparently favorable measures of financial conditions we are seeing. This is actually very easy to see in the QS report. If you compare the levels of asset prices—like cap rates, stock market prices, or bond prices—with the equity premium or the adjusted cap rates, you see that we go from being at very high levels to being close to normal levels. And if you do a simple calculation using asset price formulations, a calculation that you can do in your head, with a very low *r**, you get higher P/E ratios in the stock market than you have historically, and it can explain why the P/E ratio today is very high.

So it's important to keep this channel in mind when considering the implications and potential wealth effects from higher asset prices. Standard economic theory says that household spending responds differently to higher asset prices coming from a lower discount rate than from better economic prospects in the form of improved expected cash flows. Higher expected cash flows generate an unambiguous positive wealth effect. However, a rise in stock prices that's due to a fall in *r** generally has a much more modest implication for consumption because the path of real dividends remains unchanged.

In other words, the source of the change in asset prices is critically important for assessing their effects on the economy. My own interpretation is that a low *r**, which is actually a reflection of negative news if you think about it—slower potential growth, less aggregate demand, if you will—is a key driver of high values in equity and real estate markets. And one implication of that is, we're unlikely to get a big boost in spending from what would seem to be very favorable financial conditions. So my own forecast, as I mentioned earlier, is that I expect economic growth to continue to be about 2 percent and actually to slow to closer to potential next year. Thank you.

CHAIR YELLEN. President Harker.

MR. HARKER. Thank you, Madam Chair. Over the intermeeting period, economic activity in the Third District has softened a bit, but overall the outlook remains positive, if a bit more subdued. Employment growth rebounded slightly in June after falling for the previous two months. However, on a year-over-year basis, it remains positive. Sectors showing significant strength are eds and meds, and leisure and hospitality. Our unemployment rate remains just a bit above that of the nation.

Other areas in which growth has slowed are the sales of autos and light trucks, which have been flat of late. In addition, retail activity in general has not been very strong, which is reflected in both hard and soft data releases for the region. Unlike the nation, Pennsylvania has yet to fully recover to pre-recession levels, and activity in the retail sector has been trending down since 2001.

Our outlook for manufacturing remains one of steady growth. Although our manufacturing index edged down for the second straight month, it remains above its nonrecessionary average. However, recent readings on shipments and new orders were fairly depressed. Regarding services, they appear to be growing modestly, and employment in the sector is picking up a bit. Additional evidence of softening was reported by a diversified manufacturer who indicated that his order book for September is depressed relative to double-digit growth in both July and August. It appears to him that firms may be moving to a more wait-and-see attitude, as it looks increasingly likely that not much will be accomplished in Washington this year. Countering this sentiment is the large run-up in the future capital spending index, which now stands at its highest reading since March 1984. The dominant reason for the increase was a significant drop in the number of firms planning to decrease investment. Additionally, there continues to be no evidence of any price pressures.

Our region's housing sector is growing but only slightly. Permits recently edged up a bit, especially with respect to single-family homes, but the profile for this series remains fairly flat. Finally, expectations for the future remain optimistic among both households and firms.

Regarding the national economy, I see very little to disagree with in the staff forecast. I anticipate GDP growth slightly above trend and the gradual return of inflation to target, although my concern over that forecast has risen. Although the staff compellingly points to the change in the distribution of 10-year inflation expectations as providing evidence that declining inflation expectations are not a driver of the recent decline in longer-term interest rates or expected inflation, I believe there is other evidence that paints a different picture. As mentioned by one of the respondents quoted in Simon Potter's memo, we could be seeing an unwinding of expectations of positive inflationary shocks. Namely, it is possible that we are witnessing a declining belief that fiscal policy will be expansionary and a declining belief that the path of monetary policy is accommodative.

In particular, the March move signaled increased resolve on our part to normalize interest rates. The SEP forecasts may be interpreted as a move toward a fairly restrictive monetary policy, especially if market participants view r^* as somewhat lower than what is implicit in our communicated path. Such a view would be consistent with the recent behavior of long-term rates, which have not been moving in line with the funds rate. If market participants view r^* as depressed, our projected policy path represents restrictive policy that will cause inflation to remain below target.

So is there other support for this? Well, I think there is some support for this view. It can be found in data reported on the Federal Reserve Bank of Minneapolis website regarding the probabilities of five-year inflation rates being either above 3 percent or below 1 percent.

Following the election, the probability of inflation exceeding 3 percent increased, and the probability of it falling below 1 percent declined. Those movements have partially reversed themselves since February, indicating that there is greater belief that disinflationary pressures have risen. The possible decline in inflation expectations is then feeding into the weakness we are seeing in current inflation.

Additionally, the lack of any other significant explanations increased my uncertainty regarding my inflation forecast, and that uncertainty is tilted to the downside. Washington appears increasingly unable to get much done, and we face the possibility of hitting the debt ceiling, which is now a downside risk. Thus, the behavior of inflation will take on increasing importance in shaping my view regarding appropriate monetary policy over the remainder of the year.

Now, I want to make one other comment on the question of inflation. I also appreciate the staff's memo, but I'd like to offer a possible suggestion for future work. The view at my bank is that there may be an overreliance on the Phillips-curve methodology in our discussions. You know, there exists a large literature indicating that Phillips-curve forecasts are not particularly good. Here I am thinking of the work by Atkeson and Ohanian and a number of papers by Stock and Watson, to cite just a few, as well as recent work by our staff in Philadelphia. They find that forecasts based on simple univariate time-series models generally outperformed canonical Phillips-curve forecasts. Additionally, inflation forecasts using Phillips curves are generally conditionally inferior to those based on univariate forecasts, especially over the post-1984 period, even when conditioning on Phillips-curve-type terms.

So if you look outside the Phillips curve literature, there are some recent studies that point to other labor market indicators as being more relevant to wage and price inflation

dynamics. These indicators center on flows. There is work, for example, by Jason Faberman and Alejandro Justiniano at the Federal Reserve Bank of Chicago that points to a strong relationship between quits rates and both wage and price inflation, with movements in the quits rate possessing a leading relationship of up to two or three quarters. The conclusion that flows may be more tightly linked to nominal wage growth is confirmed by some recent work by Moscarini and Postel-Vinay, who find that increases in employer-to-employer transitions are linked to wage growth, both empirically and theoretically. So both quits rates and EE transition rates have recently approached pre-recession levels. Thus, inflation forecasts based on these variables may fail to explain current low inflation rates. But I am curious as to the staff's evaluation of this line of research and whether it's worth pursuing. Thank you, Madam Chair.

CHAIR YELLEN. I suggest we take a break—maybe about 20 minutes? Coffee is ready outside.

[Coffee break]

CHAIR YELLEN. Let us resume. Okay. President Kaplan.

MR. KAPLAN. Thank you, Madam Chair. In my bank's most recent energy survey, a majority of our respondents said that while they observed some global inventory drawdowns, they expect global oil supply and demand to reach a sustainable balance sometime in 2018. This is somewhat of a delay from previous expectations of balance in 2017. Despite this delay, the key still is that we think we're heading toward balance in the near future, either at the end of 2017 or in the first half of 2018. Our industry contacts cautiously expect OPEC and other oil-producing nations to substantially adhere to their agreement to cut approximately 1.8 million barrels a day, and they expect global demand to grow, on average, 1.4 million barrels a day. In our judgment, the reason for the delay and the concern about market balance is primarily due to

increased production from Libya—about 500,000 barrels a day—and, to a lesser extent, Nigeria, as well as to a substantial increase in U.S. production from approximately 8.9 million barrels per day at the start of 2017 to about 9.4 million barrels per day today and a forecast of about 9.8 million barrels per day by the end of this year. That is, by historical standards, a very substantial increase in production.

Based on this increased supply, market prices have been volatile and moved from the low 50s earlier this year to approximately the mid-40s today. Obviously, market speculators and traders play some role in this volatility. But because of the drop in prices, weekly data from Baker Hughes, an equipment supplier, as well as our own contacts suggest that while rig count is still increasing, albeit at a much reduced rate since the first quarter of 2017. In addition, our surveys suggest expectations of activity levels materially declined in the second quarter, and expectations for further rig count growth in the second half of the year are dramatically reduced. However, our surveys also suggest that even at $45 per barrel, there are various locations, particularly in the Permian, at which drilling in the United States is still highly profitable.

In terms of the District, Texas job growth registered approximately 2.7 percent since the start of the year. This is the fastest rate of job growth in more than two years. The state has certainly benefited from increased energy activity as well as strengthening in manufacturing and acceleration in professional and business services.

A Federal Reserve Bank of Dallas team recently visited Mexico. We met with Governor Carstens as well as other senior business and government leaders, including the minister of finance. As you may know, the peso declined approximately 15 percent against the dollar from November 2016 to January 2017. It has since appreciated roughly 20 percent and now stands at a higher level than immediately before the U.S. election. Despite that, and because of this

volatility, the Mexican inflation rate has risen to more than 6 percent now, and the central bank has had to raise its federal funds rate 10 times over the past 19 months to 7 percent, initially because of weakness in energy and then more recently because of post–U.S. election concerns in Mexico.

While central bank actions have created headwinds for economic growth, Mexican GDP is expected to grow approximately 2 percent in 2017. There is, of course, substantial nervousness about the ongoing trade negotiations with the United States. Research at our bank—some of it done jointly with the Banco de Mexico—shows that in excess of 70 percent of U.S. imports from Mexico involve intermediate goods, meaning they are part of sophisticated supply chain and logistical manufacturing arrangements. Further, approximately 40 percent of the content of U.S. imports from Mexico is U.S. content. The point is that the character of the trade relationship with Mexico is much more about manufacturing partnerships than about the import of final goods, as is heavily the case with the trade deficit with China.

Our research also suggests that these manufacturing trade partnerships with Mexico likely improve U.S. competitiveness and help retain U.S. jobs, and that those jobs would otherwise likely be lost to other parts of the world, particularly Asia. This is a very strategically important relationship, and we talk about it a lot because we would like to help ensure that the diagnosis is done correctly so we make the right strategic decisions in the United States. We don't want to see U.S. competitiveness actually eroded in the zeal to cut the trade deficit with Mexico. So this is an issue that we do a lot of work on.

Regarding the nation, we continue to expect real GDP growth of a little more than 2 percent in 2017. At that rate of growth, I would expect slack to continue to be removed from the labor force, as others have said, and we'll continue to make good progress toward reaching our

full employment objective. Regarding inflation, though, I also believe that, with a lag, as we continue to remove slack from the labor market, wage pressures should build up, and there should be some transmission to growing inflation pressures. That's the cyclical effect. I do believe that this cyclical effect is likely to be offset—and is being offset to some degree—by the secular forces of technology-enabled disruption and, to a lesser extent, globalization.

Technology-enabled disruption means people being replaced by technology, and consumers are much more enabled by technology to shop for the lowest price and the best value. Based on conversations with both our contacts and our calls more generally, these forces are substantially limiting the pricing power of businesses and the ability of businesses to translate wage increases into price increases. I believe this trend is accelerating, and businesses that I talk to are dealing with it by focusing on further cost savings and additional technology-enabled efficiencies.

In the face of these opposing forces—the cyclical versus the secular forces—at this point, with the federal funds rate at 100 to 125 basis points, I am inclined to be patient and observe inflation data as they unfold in order to gauge whether we are continuing to make progress in meeting our 2 percent inflation objective. More on that tomorrow. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Powell.

MR. POWELL. Thank you, Madam Chair. The incoming data since the previous meeting have left the outlook little changed but have also done little to resolve the uncertainty regarding inflation. In sum, the economy continues to expand at a moderate but above-trend pace, and the labor market continues to tighten. There is scant evidence at the moment that wage pressures are building or that inflation is moving up to our 2 percent objective. Looking forward, with still-accommodative financial conditions, I do expect that we will continue to see above-

trend economic growth and improving labor markets. I also expect, albeit with less confidence, that inflation will move up toward target.

Our high-frequency indicators continue to point to a rebound in real GDP growth in the second quarter, with continued solid gains in private domestic final purchases, as sources of strength appear to have shifted from residential and business fixed investment in the first quarter to personal consumption in the second. The improvement in consumption makes sense, as the first quarter was held down by transitory factors. Despite a weak retail sales report for June, I expect solid gains over the rest of the year, supported by ongoing labor market improvement. I also anticipate that the resurgence in business investment that we've seen this year will continue, in light of strong fundamentals. Synchronized growth in most major economies around the world offers some upside risk. Overall, I see GDP continuing to expand at a moderate but above-trend pace over the remainder of the year.

Regarding labor markets, the unemployment rate has fallen ½ percentage point over the past year, while participation has remained about flat. With the strong June report over the first six months of this year, payroll employment gains have averaged 180,000 a month, about the same as last year, and this pace is consistent with a ½ percentage point drop in the unemployment rate over a year, assuming an unchanged participation rate. On this path, the unemployment rate should decline to the low 4s by the end of the year, a bit below most assessments of the natural rate. A tightening labor market should mean a gradual acceleration in wages and, ultimately, prices, but so far that is not in the data, although we are hearing more anecdotal evidence of difficulties in hiring. As always, there is high uncertainty regarding the level of the natural rate as well as about the relationship between slack, on the one hand, and wages and prices, on the other. Nonetheless, I continue to expect that unemployment will

decline a bit further and remain at low levels for some time, which could draw more workers into the workforce, put upward pressure on wages, or cause businesses to invest more as labor costs rise, all of which I would view as desirable outcomes. In a sense, this is the place I have hoped for some time that we would eventually find ourselves.

Turning to inflation, core PCE prices increased only 1.4 percent over the 12 months ending in May, and incoming CPI data suggest a similar reading for June. The decline in inflation this year from the 1.7 percent rate seen last year has been a surprise, and the question is whether it is transitory or instead reflects more persistent factors, such as a lower trend inflation or more slack. The Tealbook has inflation moving back up to 1.9 percent next year. As explained in the staff memo, behind this forecast is the thought that this year's unexplained weakness is the mirror image of last year's unexplained strength. That strikes me as a reasonable baseline, but the risks do appear to me to be tilted to the downside, particularly with wage pressures remaining moderate and inflation expectations still running lower than their pre-crisis levels. With inflation generally running below our target for the past decade, it remains important that markets have confidence that the Committee will pursue policies that get inflation up to the 2 percent objective.

Finally, a word on longer-term interest rates and financial conditions. The Committee has been in a gradual tightening cycle since December 2015. Longer-term rates, however, are about flat, on net, since the first rate increase. Over the same 18-month period, on net, the dollar is weaker and equity prices are higher. So overall, financial conditions are now looser than in December 2015, despite the four rate increases.

The staff note lays out the many factors that are at play and attributes much of the 90 basis point downside surprise in longer-term rates to lower expectations for the longer-term

level of short rates and to lower term premiums. The implications for policy depend on one's views on the causes. There is a risk that financial conditions are or will become too accommodative for the state of the economy, although I see no evidence of that today. I also do not see an implication that monetary policy has been ineffective or that the Committee should be tightening more quickly. I find the level of asset prices broadly to be high, but not alarmingly so, although it would not be a surprise if there were to be a correction. I do think that the Committee will need to keep a close eye on asset prices and credit growth, as I will discuss tomorrow. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Bullard.

MR. BULLARD. Thank you, Madam Chair. Eighth District contacts continue to report business conditions consistent with steady growth. Some businesses that have a significant international presence are reporting 2017 results somewhat above expectations as they stood earlier this year, but other businesses that are more or possibly exclusively domestically based are reporting only a modest rebound after a slow start to the year. The District agribusiness sector remains weak, and that sector is not expected to improve meaningfully this year. The District unemployment rate is 4.0 percent based on the latest reading, well below the national average. Nevertheless, District price pressures remain moderate overall.

A recent Federal Reserve Bank of St. Louis staff analysis looked at MSA-level prices and unemployment rates. According to that empirical work, a 1 percentage point fall in the unemployment rate would be associated with an increase in PCE inflation of just 9 basis points. I read this result as a further indication of how much the unemployment–inflation relationship has continued to soften in recent years. As the unemployment–inflation tradeoff relationship

appears to be very weak, I do not think that the Committee should use the Phillips curve as the centerpiece of a preemptive normalization strategy.

A year ago, the Federal Reserve Bank of St. Louis adopted a regime-based approach to the thinking about the evolution of the U.S. economy. That approach describes the current era as one of low economic growth, low nominal interest rates, and low inflation. The regime-based concept suggests that current levels of these metrics on the U.S. economy will persist over the forecast horizon, and that there should be very little expectation of reversion to historical means in any of these variables, barring a major shock to the economy. In particular, we suggested that real GDP growth would likely remain near its average of recent years of around 2 percent. For all of 2016, the U.S. growth rate was very close to 2 percent, Q4 over Q4. For the first half of 2017, the Q1 growth rate was 1.4 percent, and tracking estimates for the second quarter are averaging about 2½ percent. That suggests a growth rate for the first half of 2017 of about 1.9 percent. This seems quite consistent with the regime-based conception.

Inflation readings have moved lower over the past several months. Those data, combined with our policy rate moves in March and June as well as our plans for more policy rate moves in the future, have begun to put downward pressure on market-based measures of inflation expectations. Carrying on this process too aggressively may cause the Committee to miss its inflation goal to the low side over the forecast horizon. I see that possibility as potentially damaging to Federal Reserve credibility, as we're well into an economic expansion when one would normally anticipate inflation goals could be attained through reasonable policy. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Fischer.

MR. FISCHER. Thank you, Madam Chair. We live in interesting times. By the way, I looked it up. It's not a Chinese saying. It's a British saying. [Laughter] However, the economics, interesting as it is, is not the most interesting aspect of this period. Politics is more interesting, even to the point of distraction. But for this economic go-round, I will focus on the labor market and inflation.

In terms of employment, the labor market is working well, with unemployment at 4.4 percent, below most estimates of the natural rate. As the unemployment rate began the long fall from its 10 percent peak in October 2009, concerns were expressed about other aspects of the unemployment data—in particular, the high levels of the U-6 and the low levels of the participation rate, actual and expected. As the overall unemployment rate continued its decline, the relative performance of these other variables has improved to the point at which they now look similar in their relationship to the unemployment rate to pre-Great-Financial-Crisis relationships.

Nonetheless, wage inequality remains high. Should that be a concern of the Federal Reserve and of the FOMC? It's easy to say that we have no tools to deal with wage inequality. But if we were to find that wage inequality decreases when the labor market tightens, we'd have another reason to push harder for tight labor markets. Of course, continuing to push for a tighter labor market would eventually bring other consequences, some of them unwanted—financial exuberance, for example—and some of them wanted, at least at this stage, such as higher inflation. Leaving aside aggregate demand as a factor potentially influencing the distribution of income, more structural factors are more important in the longer run. Foremost among these are education at all levels, including training and retraining, and fiscal policy. But continuing a

discussion along these lines would take us too far from the monetary policy issues we need to discuss today.

Our current problem is that inflation remains stubbornly low. Why is that? Well, the lower rate of productivity growth often receives a share of the blame. But it is not so simple. The lower rate of productivity growth can explain a lower rate of increase of the real wage. The nominal wage should increase at the rate of change of the real wage plus the expected rate of inflation. So if expected inflation were equal to the target rate of inflation, nominal wage growth would contribute the same amount of inflation to the actual inflation rate, independent of the rate of productivity growth.

What else could explain a stubbornly low rate of inflation? It could be that the measure of inflation relevant to the labor market is not the targeted rate of inflation. Our target is 2 percent for the price index of PCE. But the CPI, which is the measure most sentient human beings think of, has recently been rising more rapidly than the PCE. I confess also to being confused as to what to make of the Michigan mean expected inflation rate, which was once 3 percent but has for some time been declining toward 2 percent. We accept the level as distorted but its rate of change as accurate. That is possible—but hard to understand fully.

Or it could be that the good old Phillips curve isn't what it used to be. In particular, I wonder whether the credibility that the 2 percent inflation target has built up, as the expected inflation rate of a date several years in the future, has altered the slope of the Phillips curve since the pre-inflation-targeting era. I believe we are aiming for a target that is not the variable that most people in the economy think of when they talk about the inflation rate via a Phillips curve structure that is neither reliable nor precise. For several reasons, I believe we would be better off if we had a target range for the inflation rate, which in the case of the United States I would put

at 1.5 to 2.5 percent, rather than a single number. Of course, this possibility was discussed in 2011 when the target inflation rate was being decided on, and it was rejected, but it's worth reopening that discussion.

I have often wondered what it would be like to live in a steady state. [Laughter] Now I am beginning to think we may be in or very near a stochastic steady state with an unemployment rate that is in the vicinity of 4.4 percent or 4.5 percent and an inflation rate that is in the vicinity of 2 percent, and that we can't do much better than that. So we could sit back and keep on doing what we've been doing lately while recognizing that there are many other policy tools that others could operate, which would help raise the employment rate and even r^* and the rate of productivity growth. For evidence that r^* is not an immovable constant, I think of the initial equity market response to the election of President Trump and to the subsequent financial market responses to the failure to pass the measures that had caused r^* to move in November 2016.

So what should we do? We certainly need to come to a decision on whether our Phillips curve apparatus remains usable or needs serious reconstruction. In the meantime, we should continue using the models we have with the expert assistance to FOMC participants that is offered by the people who prepare the Tealbook—some of them sitting around the table, others in the audience. We should also listen carefully to many of the interesting points that are being made by our colleagues from the regional Federal Reserve Banks, as they've made them today. My experience is that when you have a model that is well based and has been useful in the past but seems not to be working as it used to, the best strategy is to wait for the economy to work as the model implies. [Laughter] At some point, that strategy could lose its persuasiveness, but we are not yet at that point.

One final subject looking ahead. I don't think that nominal income targeting introduced in the Monetary Policy Strategies of Tealbook A is a good idea and will explain why tomorrow. Thank you, Madam Chair.

CHAIR YELLEN. Okay. President Evans.

MR. EVANS. Thank you, Madam Chair. I believe nine speakers have come before me, and it's been a very rich discussion, so I've enjoyed it.

Most of my contacts continue to describe business conditions as "steady as she goes." Demand is generally stronger for consumer-facing sectors than for business-oriented activities, and this has been the case for some time. However, not all of the reports from the consumer sector were that upbeat. Auto sales have softened noticeably. Until recently, our industry contacts were not overly concerned about sales falling from the high levels posted in late 2016 and early 2017, but the numbers for June and early July have made them more concerned about the firmness of underlying demand. A big question is how the industry will respond to any further slowing. At similar points in the past, automakers increased incentives to keep sales from falling too much. Obviously, higher incentives reduced transaction prices and were bad for profits. This time, the automakers are optimistic that the industry's more-flexible labor contracts will allow for larger production adjustments and greater pricing discipline. This latter outcome seems possible, but some mixture of responses would be a reasonable guess. So I won't be surprised to see some further downward pressure on vehicle prices over the coming months.

Regarding business investment, my contacts generally were positive. But, once again, the bulk of these reports reflected optimism about future prospects rather than actual current increases in expenditures. As one Chicago-area banker put it, customers talk a good game, but they're still slow to sign off on the additional borrowing they need to fund capital expansion.

The news about labor markets was largely similar to the past few rounds. There were a couple of additional reports of relatively rapid wage increases in some sectors, but such commentary was not the norm. Furthermore, the larger wage increases tended to be in sectors in which good productivity gains would likely offset the upward effect on unit labor costs. In sum, my contact reports seemed to indicate the same underlying pace of growth that we've seen for some time. As best as we can judge, this is consistent with an economy operating at full employment but with little price pressure.

Regarding the national outlook, we left our real GDP growth projection essentially unchanged this round. Second-quarter growth appears to have improved from the first-quarter lull, and the economy seems to be on track for above-trend gains through the remainder of the year. With regard to resource slack, we basically are at full employment. My assumption is that the natural rate of unemployment is around 4½ percent, and that is essentially where we are now. In addition, most of the other measures of labor market slack have now recovered to pre-recession levels. One exception is the share of workers who are part time for economic reasons, but that may reflect longer-run trends more than cyclical weakness. Being at full employment, it seems worth emphasizing that the economy is not close to the point at which labor markets would generate significant inflationary pressures. And when the unemployment rate drops further, as it does in the staff outlook and many of our SEP forecasts, I think the resulting buildup in inflation pressures will be gradual.

Clearly, the Phillips curve is flat near the natural rate, and I don't put much weight on the risk that it will steepen significantly as we reach the lower unemployment rates that I'm projecting. My SEP had the unemployment rate reaching 4 percent in 2019. My staff took another look at nonlinearities in the wage Phillips curve using state-level data. These are

candidates for the "Kashkari ghosts"—ghosts that President Kashkari mentioned having to do with nonlinearities in the Phillips curve. The effects of any higher-order polynomial terms or nonparametric kinks that the analyses could tease out of the data were economically small. This was especially true over the more recent 1994–2017 sample period, and the results were sensitive to the particular model specification of the spline components' breakpoints or acceleration parameters.

These results were consistent with my conversation with the CEO of Manpower, who has a broad window into labor markets worldwide. He also downplayed the idea of a nonlinear response. He indicated that all around the world, firms were refusing to raise wages unless productivity increased first. In such an environment, he thought it unlikely that looming nonlinearities would bring outsized wage gains, even if labor markets become noticeably tighter.

So while my economic forecast does see tightening resource slack over the projection period, this boosts inflation a bit, but I do not see a large risk of it generating outsized inflationary pressures that would be difficult to control with modest adjustments to the trajectory of monetary policy, if that became necessary. To the contrary, I continue to be quite uneasy about the outlook for inflation reaching 2 percent during the projection period. I just discussed the lack of substantial upward pressure coming from resource slack. More immediately, I'm not hearing of any firms trying to pass on significant price increases, and, of course, the data on consumer price inflation since our previous meeting have been disappointing.

We need more time to determine the extent to which these weak inflation readings are indeed transitory one-off events or whether they represent more lasting low-inflation developments. In our bank's analysis, we did assume some persistence, and for the second consecutive round we lowered our inflation projection one-tenth per year throughout the forecast

period. We now reach just 1.8 percent at the end of 2019. This forecast is consistent with what I heard from my financial market contacts. This round they questioned more strongly whether we will ever achieve our inflation target with the policies they see in the SEP. This is hardly a sign of tangible progress toward the firming of inflation expectations that we need in order to achieve our inflation objective over the medium term. So, in my view, accommodative policy still has a decent amount of work to do.

If I could take another minute: I have to say that I have a lot of sympathies with the comments that President Kashkari made regarding financial stability issues, and basically a request for more staff background on financial stability risk and how it affects monetary policy. For example, I interpreted President Kaplan's observation about annual stress tests being quite useful, relative to skipping them. What if the Congress changes Dodd–Frank and makes it not acceptable for the Federal Reserve to do annual stress tests or, in some other way, in our view, weakens supervisory tools? I thought the thrust of President Kaplan's suggestion was that we'd be facing greater financial instability risk if we can't do everything that we're supposed to. So the Congress is another element.

And there are other types of shocks, too, that would lead to greater financial instability risk, potentially without us being able to improve our inflation and unemployment goals.

This takes us back to a discussion that we had at least going back to, say, March 2013. I think the Committee had a pretty robust discussion of this in the context of, what if we have to raise rates in order to deal with financial instability risk at a time when unemployment or inflation wasn't acceptable? And, in light of the changing composition of the Committee, it might be useful to revisit some of those discussions. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. First Vice President Mullinix.

MR. MULLINIX. Thank you, Madam Chair. New information since we last met has not changed my view of the current state of the economy, nor my outlook. The labor market is tight and continues to tighten, but inflation has remained low. My remarks will focus on these items, the two central components of our mandate.

I found the staff memo a useful summary of what we can say about inflation over the short run. The memo makes a compelling case that in the current environment, inflation behavior is mostly driven by temporary and idiosyncratic shocks, with resource utilization having only a limited effect on inflation. That is, the Phillips curve is flat. Of course, it may only remain flat over a range, so it's important to assess the degree of resource utilization. And here I believe that a wide range of indicators support the view that labor markets are tight now. And according to the Tealbook's forecast of employment growth, labor markets will get even tighter very soon. For example, the unemployment rate is below estimates of its natural rate, and labor force participation is above estimates of its longer-run trend. Job openings have exceeded their pre-recession levels for the past few years, and quits rates have now returned to their pre-recession levels. But these indicators of tight labor markets are frequently discounted because we have not seen a substantial acceleration of nominal wages.

Let me address this issue on two dimensions. First, even though nominal wage growth has been moderate, real wage growth has exceeded very poor labor productivity growth, so that the labor income share of GDP has been increasing over the past few years. This is significant because the labor income share tends to increase in well-established expansions, when labor markets are tight. My staff has noted that, while the calculation of labor income shares for the aggregate economy is fraught with measurement difficullties, these difficulties are less prevalent if we focus on the nonfinancial corporate sector, which represents about two-thirds of the

business sector. In this sector, the labor income share has increased steadily since 2014 and is now almost at pre-recession levels. Strikingly, the magnitude of the labor share recovery is only somewhat smaller than what we saw in the boom market of the late 1990s.

Second, the Tealbook notes that labor productivity growth tends to slow when labor markets are tight, perhaps because the productivity of new hires tends to be below the average of currently employed workers. The same argument applies to the calculation of average wages. The decline in the average quality of the workforce imposes a headwind on the growth in average wages, precisely in the face of labor market tightening. My staff's reading is that this countercyclical composition effect is well enough established to warrant consideration. This suggests that we should discount measures of average wage growth and focus more on wage measures that try to correct for this composition effect. The Atlanta Fed's Wage Growth Tracker does just that. And since 2015, it has been running at 3 percent or higher, which is significantly more than most measures of average wage growth.

What we hear from our contacts in the Fifth District economy also supports the view that labor markets are tight, with the economy growing moderately. For example, a manufacturer indicated that despite increasing wages, workers were so difficult to find that it was looking to cut production or move operations. A steel manufacturer reported strong orders, which led it to increase wages and benefits in order to hire and retain workers and to spend more on capital improvements than it ever had before. Beyond the labor market, a contact with a machine tool manufacturing association reported that orders were up year-to-date in the Southeast as well as nationwide, and that it was expecting orders to increase this year for the first time in three years. More generally, our latest survey results indicate that activity in the manufacturing and service sectors increased at a solid pace in July.

To conclude: There's been ample discussion of the possibility of a Phillips curve that is flat now but may turn steep. I believe this is best viewed as a matter of risk management. In that regard, with the real funds rate negative, my concerns lean more toward resource utilization being too close to the edge than about inflation not being close enough to the target. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President George.

MS. GEORGE. Thank you, Madam Chair. The 10th District economy has continued to expand since the previous meeting, with the regional labor markets strengthening further. Incoming data point to an acceleration in hiring and wage gains over the first half of 2017. The most substantial gains have come in energy-dependent states, in which mining-related employment has seen its strongest growth in several years. However, these energy-related improvements may prove fleeting. Despite an extension of production cuts by OPEC and non-OPEC members in May, oil prices recently returned to pre-deal levels. With weakening prices, the pace of expansion in our region's energy activity has already started to slow. Under the outlook for future prices, industry contacts don't anticipate a substantial increase in drilling activity for the foreseeable future.

Looking across regional economic activity more generally, contacts in both the services and manufacturing sectors reported a strong increase in activities so far this year. With labor markets continuing to tighten in the District, the majority of our business contacts are expecting to raise wages between 2 and 4 percent over the next 12 months.

As much of the private sector strengthens, our state and local governments continue to face challenges. State expenditure growth is expected to be minimal in most 10th District states, as weaker-than-expected tax revenues and rising health-care costs are leading to budget

shortfalls. In order to balance their budgets, many state legislators have relied on nonrecurring revenue sources such as mortgaging buildings, tapping rainy day funds, and transferring resources to the general fund from other agencies. Several states have also raised taxes and reduced spending for higher ed and Medicaid.

Regarding the national outlook, recent data have not altered my expectations for economic growth this year. Investment spending seems likely to moderate in the second quarter, while consumption growth appears to have rebounded, as expected. I anticipate these trends will continue. Business investment is likely to continue to advance this year but at a much more modest pace than in the first quarter. Heightened policy uncertainty, particularly in the health-care sector, together with the outlook for energy prices is likely to have a damping effect on capital outlays in the second half of the year.

Consumption growth, on the other hand, appears poised to gather momentum as labor markets continue to fuel household expenditures. In particular, a solid rise in total payroll compensation in the second quarter, due in part to an increase in hours worked, suggests more spending power for consumers over coming quarters. Growth in total hours worked on a 12-month basis stepped up to 2 percent in June from its 1.6 percent pace a year ago. Despite payroll growth moderating over this time, there’s been a notable shift toward full-time employment and away from part-time employment, as President Williams noted.

While increases in aggregate measures of nominal wage growth have been modest, the recent rise in hours worked signals another margin on which the labor market continues to improve. My base case for payroll growth remains similar to the path described in the Tealbook. As labor markets tighten further, I continue to anticipate that payroll growth will slow to a level consistent with longer-run trend growth. As payroll growth has been surprisingly robust to start

the year, however, there may be some upside risk to this view. Looking at postwar economic expansions, one finds that, typically, payroll growth doesn't slow much after the economy reach full employment. Instead, it screeches to a halt ahead of the next recession. In fact, in the previous two jobless recoveries, payroll growth actually accelerated somewhat after surpassing full employment. This historical track record, together with recent payroll numbers, serves as a cautious reminder of how difficult it will be to achieve a soft landing.

As noted by others, financial conditions continued to ease over the intermeeting period as corporate bond spreads reached post-recession lows and term premiums on U.S. Treasury notes remain negative. In such a low interest rate environment, investors' search for yield is highlighted in the financial press from time to time, and I was recently interested in one such story that noted a group of investors approached Argentina's government about issuing a 100-year bond offering a yield of 7.9 percent. Despite the fact that Argentina has defaulted eight times in its history, with recent investors taking haircuts of nearly 80 percent, the issuance attracted strong demand, as the sale was more than three times oversubscribed.

Beyond these kinds of anecdotes, I do see systematic changes to the way state and local pensions are operating in the current interest rate environment. The median public pension fund has lowered its assumed rate of interest to 7¾ percent. As a result, public pension plans have been moving a growing share of their portfolios out of traditional equities and bonds and into real estate and alternative equities, which include private equity and hedge funds. In 2001, fewer than half of pension plans were invested in such instruments, whereas more recently nearly 90 percent of pension funds have pursued alternatives like this.

Finally, inflation continues to resist the Committee's desired 2 percent objective. While that stubbornness has raised concern, the key issue I see with current levels of inflation is how

much, if any, signal we should take about price stability in a low-growth economy. For the past several years, labor market slack has been a source of downward pressure on price inflation, and large import and energy price shocks created disinflationary pressures that are only gradually fading. For example, the 12-month inflation rate of imported consumer goods remains near zero, and oil prices in June were again below year-ago levels. With the unemployment rate down to 4.4 percent, there's good reason to expect the effects of these downward pressures on inflation to prove transitory. On the other hand, I recognize concerns that the prolonged period of below 2 percent inflation may indicate that the natural rate of unemployment has moved lower or that inflation expectations are anchored below target. If either is true, then inflation may persist below 2 percent even as these transitory effects fade.

For now, I lean toward the view that low inflation is transitory, with the signal from recent readings blurred by declines in a few components. As a result, my outlook continues to anticipate that we'll see inflation rise to 2 percent over the medium term, and with that outlook, our current policy path seems about right. However, I'll be closely monitoring incoming data to support this view. If evidence accumulates that inflation is not moving toward 2 percent as headwinds diminish, then adjusting the pace at which we move rates to a neutral policy stance may need to be considered. Thank you.

CHAIR YELLEN. Thank you. President Bostic.

MR. BOSTIC. Thank you, Madam Chair. The sentiment of my directors and contacts regarding the business outlook was little changed from previous cycles, as most continue to describe a moderate growth environment. The post-election optimism regarding new pro-growth policies coming out of Washington continues to erode, but we don't get any sense that the declining sentiment is likely to result in a setback to the pace of business activity. The effect of

eroding confidence in policy changes is, according to our contacts, simply more certainty that the upside potential to the economy is unlikely to materialize.

There are pockets of concern about activity from some familiar sources. For example, consistent with reports from my colleagues today, my director report representing a large, nationally based retail auto organization noted that 2017 will be the year when the string of one record sales year after another will be broken. He warned that production has not aligned with that reality, and he expects to see a much longer plant closure and retooling cycle this year in response.

Overall, however, the anecdotal reports we received in this cycle are consistent with our tracking estimates that suggest that first-half 2017 real GDP growth will come in near the recovery average. For now I feel relatively comfortable with my GDP growth forecast, which is essentially the same as the median forecast in the June SEP.

I feel no such comfort with my outlook for inflation or the related issue of the degree to which labor markets are tight. I think there is something in the official statistics for both sides of the "tight versus not too tight" debate. On the tight side, even the broad measures of the unemployment rate seem clearly at or below the pre-crisis norm. Available persons per job opening—which is available persons being measured as the number of people in the BLS household survey who report they want a job—is at its lowest level since at least 2001. And I want to thank First Vice President Mullinix for highlighting my Bank's Wage Growth Tracker, which has been showing stronger wage growth than other reports are showing.

On the other hand, the not-too-tight case is, I think, supported by the fact that the participation rate has moved upward against this downward demographic trend and the fact that labor compensation growth is showing no sign of acceleration. In this cycle, we pushed our

contacts and directors pretty hard on their views about the condition of labor markets, but, more importantly, we probed on the question of exactly how they are reacting or planning to react on those perceptions. To be sure, many businesses across a wide variety of sectors expressed their belief that labor markets are tightening, and we hear many reports of firms stepping up their efforts to attract and retain employees by offering a wide variety of nonwage and salary benefits such as flexible hours, access to amenities, in-house services, and various quality-of-life programs.

That noted, it was striking that absent in our conversations with contacts is much of any mention of concerns over wages. The majority of District contacts still plan broad-based wage growth in the 2 to 3 percent range, consistent with what we have seen in the national numbers. Pay increases above that range seem to be generally associated with specialty skilled workers and in pockets of high demand, such as housing. And, for the most part, we do not hear that employment growth and business activity are constrained by the lack of available qualified labor, again, outside of a few cases such as nursing services or residential construction.

The overall sense I get is that businesses are still averse to broad-based wage increases because they are uncertain about future demand, and labor market conditions do not seem to be consistently pushing them to abandon their aversion to structural wage increases. I'll emphasize again that there's plenty of sentiment out there that it is only a matter of time before the benign wage environment gives way, but, for now, I don't see a lot of evidence in the actions of our contacts that suggest that time is imminent, which brings me to my inflation outlook.

At the previous FOMC meeting, I noted my concern regarding a few recent weak inflation reports. Now I'm puzzled and perhaps a bit troubled, as the few reports have now turned into something that looks more like a trend. As with wages, we spend a lot of time asking

our contacts about their views on pricing in their businesses and sectors. I wouldn't say that we heard much in the way of beliefs that the pricing environment has dramatically shifted into disinflation mode. So I'm sympathetic to exhibit 8 in today's staff presentation on the U.S. outlook which shows "other factors" as the primary driver of the weakness in the recent inflation numbers. In essence, I'm tempted to shrug my shoulders and say, "Stuff happens."

On the other hand, with just a few exceptions, we did not hear anything in expectations about costs, market tightness, or perceived pricing power that would suggest a dramatic acceleration of inflation and would constitute an upside inflation risk. To be completely honest, I'm thankful that we'll get two additional reports before our next forecast round. If I had to submit an inflation forecast today, it would look a lot like the markdown we saw in the Tealbook and perhaps be even more pessimistic than that regarding 2018. However, on the basis of the evidence in hand, I'd have to give serious contemplation to shifting my balance of risks for inflation to the downside, and the probability I am placing on that downside scenario is increasing. That is weighing on my thoughts about the appropriate policy path, but I will defer that discussion to tomorrow. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kashkari.

MR. KASHKARI. Thank you, Madam Chair. Starting with the Ninth District economy, we continue to see a strong labor market with anecdotal reports of poor labor availability, especially among high-skilled workers, but, just as President Bostic said, not much discussion of wages going up. There are some signs of softening in real activity. Our construction sector is somewhat weaker, with commercial construction permits falling in metro areas of our District. Agriculture is under a lot of pressure. The Dakotas and Montana are struggling with the severe drought. Price pressures overall are mild. According to our midyear survey of Ninth District

professional services firms, the majority of firms expect their input prices to remain flat for the rest of the year and do not expect to change the prices that they charge for their services.

Regarding inflation, as others have noted, core 12-month PCE inflation is running at 1.4 percent, which, in my mind, is a significant shortfall below our 2 percent target. Others have noted weak March, April, and May numbers. The reversal that we expected has not yet materialized. Weak inflation has been persistent, and we do not know when it will return. Since the FOMC adopted its 2 percent target in 2012, headline PCE inflation has averaged 1.2 percent; core PCE has averaged 1.5 percent.

Measures of expected inflation are consistent with lower inflation expectations. Inflation breakevens continue to be low and, at face value, continue to indicate future PCE inflation well below 2 percent. Survey-based measures also continue to be low. In the dealer survey, the dealers' forecasts for inflation for 2018 have declined about 30 basis points, and participants expressed downside risk for the longer-run inflation target of 2 percent. Market expectations of inflation also show substantial downside risk. President Harker mentioned the Federal Reseve Bank of Minneapolis's option securities work on inflation caps and floors that shows a sizable probability, about 24 percent, of the CPI headline inflation being less than 1 percent in the next 12 months versus a probability of inflation being above 3 percent that is tiny, only around 3 percent. Basically, there's no evidence that inflation expectations are rising, and there is some evidence that they may be falling. As the staff memo noted, do we understand why inflation is persistently weak? The memo was very thorough. Unfortunately, what I conclude from it is that we don't really understand why inflation is weak right now.

Turning to the national economy, economic growth continues to be modest. The Board staff forecast is down a bit, 2.3 percent expected real GDP growth for 2017 as a whole, with a

strong rebound in the second half driven by strong PCE arising from strong consumer sentiment. However, a persistent softening in residential investment and large uncertainty on fiscal policy are at odds with the strong consumer sentiment assumptions, and nonresidential investment continues to lag.

Looking again at labor markets, strong job gains are mostly coming from increased labor force participation and are not lowering unemployment. Nominal wage growth is very modest and is not accelerating. Hourly earnings are at around 2.5 percent over the past 12 months, which is lower than the 2.75 percent in 2016.

Most recent data reinforce the weakness of the empirical link between slack and inflation. Again and again, we expect inflation to pick up because of strong labor markets, and it surprises us on the downside. As the memo noted, there are a range of possible explanations. I look at the labor force participation rate for prime-age workers, and it continues to be well below pre-recession levels. And we don't have a good story for why that should be low. I'm not buying the video games and opioids explaining everything. I think there's still slack in the labor market. Furthermore, inflation tends to be a global phenomenon. Many advanced economies are experiencing low inflation at the same time. The bottom line is that we don't understand inflation dynamics very well. There may still be slack in the labor market. We should not be confident that inflation will soon return to target. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you, Madam Chair. While I think there's a pretty broad consensus around the table that the outlook has changed very little since our previous meeting. The biggest change, as others have noted, is that the inflation data have continued to be soft, raising questions about our ability to soon get to our 2 percent inflation objective. Also, the

fact that the wage compensation growth has not climbed as the labor market has tightened is noteworthy. That said, I don't see this as a big problem. The fact that inflation is lower means that, everything else being equal, we can be somewhat more patient in terms of the pace at which we remove monetary policy accommodation and work to tighten financial market conditions.

While I agree with many others that this drop in the year-over-year inflation rate is likely to turn out to be transitory and driven mainly by special factors, we can't rule out an alternative that it is more persistent and implies that the natural rate of unemployment might be lower than what we had thought earlier. One argument is that inflation is being permanently affected by numerous structural changes, including the increased abilities of buyers of goods and services to compare prices across a wide variety of sellers, the increased sales of retail goods through the Internet versus traditional retail stores, and the effect of these changes on brand equity and pricing power. These are real structural changes, and they are going to occur over many, many years. Then that logically should mean, at least for a good, long period of time, the natural rate will be lower than what it would otherwise be. Now, if this were true, this would be pretty positive because it would imply that the economy still has unused margins of productive capacity available, and that more people can be put to work without that generating an inflation problem. So I'm not wringing my hands about it maybe as much as some who say, "Oh, this is awful, that we're not having inflation as the unemployment rate declines." I mean, the fact is, we can get more people employed. That's a good thing, not a bad thing.

As I see it, we're generally in a relatively good place. Assuming the economic outlook doesn't change materially over the next eight weeks, I think we'll be able to announce the start of our balance sheet normalization program at the September meeting. Presumably, the precise timing of when the runoff of the balance sheet would start—October 1 versus November 1, for

example—could potentially be influenced by when the debt limit issue is likely to come to a head. After this action at the September FOMC meeting, we could then wait until later in the year to decide whether a hike in our target rate for the funds rate was appropriate. By December, I am hoping that we will have sufficient data in hand to be more confident in our ability to discriminate between whether the decline in inflation is transitory and whether the natural rate of unemployment is lower than we thought previously.

Now, even if inflation were to stay lower than expected or desired, I still think there could be a good case for removing accommodation later this year. That's because financial conditions continue to ease. While I accept President Williams's points on the decline in the real interest rate, there are other aspects of financial conditions that aren't really reacting in the same way—the dollar is weaker, and credit spreads are narrower. And that doesn't have anything to do with the level of r^*. Since the previous FOMC meeting, we're seeing the same trends: Stocks are higher, and the dollar is weaker. These movements have been large compared with the modest rise we see in short- and long-term interest rates.

As I've noted many times, monetary policy does work through financial conditions. So if financial conditions do not tighten as we desire, then we are likely to have to do more. And I noted that, David Wilcox, when you were going through the forecast, you did remark about how financial conditions had continued to ease, and that did affect your views on how you adjusted the forecast. You took out fiscal stimulus, but that was offset by the easing of financial conditions. Of course, I can't predict how financial conditions are going to evolve for the remainder of the year, but I do think we very definitely have to consider this in our conduct of monetary policy.

Now, in terms of the debt ceiling issue, which is coming down the pike, it is important not to overstate how our decisions on balance sheet normalization play into this. The debt we hold also counts against the debt ceiling. So when we begin to reduce our reinvestment, this does not affect when the debt ceiling will bind. I agree that we should prefer to keep our actions from becoming part of any debt limit story. But, at the same time, we shouldn't tie ourselves in knots over this. This is not our problem, frankly. By far, the most likely outcome is that the debt ceiling will be raised in time so as to avoid disrupting the federal government's ability to meet its obligations. But even in the much less likely case, I hope, of an accident and delayed payment, it strikes me that this is not something that would drag out for more than a few days. I remember the TARP legislation failed, and then it succeeded, in part because when it failed, the stock market reacted very violently. My point is that while the debt limit may become an issue, it's not a matter that is likely to linger for long, if and when the debt limit ceiling becomes binding. Thank you.

CHAIR YELLEN. Thank you. Thanks to everyone for a thoughtful discussion of the economic outlook and attendant risks. And, if I might, I'd like to finish off the round with some comments of my own.

Starting with the labor market, the data, on balance, have come in about as expected since our previous meeting. Payroll gains were solid again in June and now appear to have been a bit stronger, on average, since the start of the year than previously reported. The unemployment rate ticked back up to 4.4 percent last month, just below my estimate of its longer-run level, while the backup in the broad U-6 measure was somewhat larger. Many of your contacts report significant difficulties in hiring, especially skilled workers. Some firms indicate that they're granting larger wage increases to retain qualified workers, and some are offering higher wages at the entry level

as well. But wage growth overall is generally characterized by businesses as relatively modest. This may be due to the type of composition effects that President Williams and First Vice President Mullinix noted, and it is certainly consistent with national data. Growth in average hourly earnings remains subdued, and the June employment report and other compensation measures continue to show only modest wage pressures. That said, with the labor market generally perceived by firms to be quite tight and becoming yet tighter, we will need to monitor wage and associated cost pressures carefully.

With respect to spending and production, incoming indicators have not been surprising overall and suggest that economic activity is continuing to expand at a moderate pace. Although retail sales in June were weak, growth in overall consumer spending appears to have been solid in the second quarter. And, in view of favorable fundamentals, consumer spending is likely to remain solid this quarter. In addition, orders and shipments of capital goods, measures of drilling activity, and readings on business sentiment point to continued moderate growth in business investment. After folding in new information on government spending, foreign trade, and activity in other sectors, the staff's estimate of real GDP growth in the first half of the year is unrevised at just under 2 percent.

On the basis of this information and in light of only modest changes in financial and international conditions since our previous meeting, my medium-term outlook for real activity is essentially unrevised. I continue to anticipate that, with further gradual increases in the federal funds rate, overall economic growth will come into line with potential by next year, allowing the unemployment rate to fall a bit further before it stabilizes.

Importantly, the amount of policy tightening required to achieve this stabilization appears to be modest, as the real federal funds rate is only 50 basis points or so below estimates of the

current value of the neutral rate. Of course, as inflation picks up to 2 percent, maintaining a neutral policy stance will likely require more than two additional hikes in the federal funds rate over the next few years, especially if the underlying strength of the economy improves, boosting the longer-run neutral rate. But, as a recent staff memo highlights, estimates of r^* show no clear indication that they are starting to rise, and we should be wary of adjusting policy in anticipation of developments that may take unexpectedly long to emerge or may not occur at all.

On the inflation front, I found the June CPI report somewhat disconcerting. Although an additional month of price data doesn't provide much information by itself, as several of you noted, it was the fourth consecutive month of weak readings. Core CPI prices have risen at an annual rate of less than ½ percent over the past 4 months, a marked deceleration compared with the previous 12 months. Of course, inflation measured over such a short period tends to be quite noisy and has only limited predictive power for future inflation once one controls for import and energy prices, survey measures of expected inflation, resource utilization, and special transitory factors. For that reason, I believe the staff is justified in making only a modest and transitory adjustment to the Tealbook inflation projection. That said, the recent softness in the price data has made me more concerned that the return to 2 percent inflation could take longer than I have been expecting. This softness coming after many years of inflation below our 2 percent objective could signal that the labor market is actually less tight than it appears. Alternatively, longer-run inflation expectations may do less than I anticipate to push inflation back up to 2 percent, either because expectations are anchored at a lower level or because their practical influence on inflation is less than our standard models would predict. For these reasons, it may be appropriate to hold off raising the target range for the federal funds rate again until we can

verify that the recent slowdown in inflation is indeed transitory—something that might not be possible before late in the year, provided economic growth remains moderate.

Let me note that residual seasonality will likely be a complicating factor in interpreting incoming price data in coming months because it is apt to hold down measured PCE inflation during the second half of the year. Aside from complicating our internal analyses, such mismeasurement would pose communications challenges. Although many forecasters and Fed watchers are probably cognizant of the seasonal adjustment issue, most market participants probably aren't. If investors take the incoming price data at face value, they may have difficulty understanding the rationale for our policy actions. Also complicating our communications will be the fact that the low price readings in recent months will continue to depress 12-month inflation rates into next spring even if monthly inflation rates move higher.

Finally, just a few words about risks relating to the current elevated level of asset prices. With corporate bond yields unusually low, equity price-earnings ratios in the top quartile of their historical range, and commercial real estate valuations quite "rich," I consider the decision in the latest QS financial stability report to characterize valuation pressures as having moved into the red zone as quite reasonable. That said, as President Williams noted, a substantial portion of the current high level of asset prices may, in fact, be justified by the current low level of Treasury yields and the nontrivial chance that a persistently subdued global economy and longer-run demographic and productivity trends may keep interest rates low for the indefinite future.

All in all, though, financial stability risks appear to be growing, and a significant market correction would clearly have adverse consequences for the economy. Of course, it's reassuring that the conditions that would amplify the consequences of such an asset price correction have yet to emerge. Leverage in the financial system and reliance on short-term wholesale funding

remain low, credit growth has been quite moderate, and the banking system is well capitalized and has ample liquidity. Nevertheless, we will obviously need to keep a close eye on financial developments. And it might be fruitful, as some suggested during this round, to consider the question of under what conditions and how we would take the associated risks to the outlook into account.

Let me stop there. I think we have plenty of time to turn the floor over to Thomas for his briefing on monetary policy decisions.

MR. LAUBACH.[5] Thank you, Madam Chair. I will be referring to the handout labeled "Material for the Briefing on Monetary Policy Alternatives."

The discussion of monetary policy alternatives in Tealbook B highlighted the tension between the recent data for inflation and those for the labor market. While the unemployment rate continues to run below your assessments of its longer-run normal value, both overall and core inflation have edged further below 2 percent. Alternatives A, B, and C all acknowledge this tension but offer different policy responses based on different perspectives on the implications of the recent data for the outlook. You might prefer alternative A if you see your major challenge as lowering the risk that inflation will remain significantly below 2 percent or decline further, potentially leading to lower expected longer-term inflation. At the other end of the spectrum, you might favor alternative C if your major concern is that an increasingly tight labor market might force the Committee at some point to tighten policy abruptly. To forestall this, alternative C takes another step in removing monetary policy accommodation at this meeting. Finally, if you view these risks as, for the time being, having offsetting effects on appropriate policy and see some further strengthening in labor market conditions as likely to contribute to inflation stabilizing around 2 percent, you might prefer alternative B, which reaffirms that a gradual removal of policy accommodation remains appropriate and makes no change in the stance of monetary policy at this meeting.

In the remainder of my remarks, I will focus on the tension in the data on financial market conditions. Some of my remarks will echo things that have already been said, but I promise to be brief. Despite your actions since December 2015 to scale back monetary policy accommodation, overall financial conditions have, by several measures, eased over the same period. For instance, as shown in the upper-left panel, the staff's estimate of the equity risk premium has fallen and is now well below its late-2015 level, and the gains in equity prices over the past several quarters may be expected to provide further impetus to private-sector spending and employment. In addition, in a pattern that is reminiscent of the so-called conundrum

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

period of the mid-2000s, despite the increase in the federal funds rate since December 2015, the 10-year Treasury yield has changed little, on net, over this period. In addition, as shown in the upper-right panel, the 10-year Treasury yield now stands almost 100 basis points below the value predicted for mid-2017 by respondents to the December 2015 Blue Chip survey. These forecasters have since significantly marked down their longer-term forecasts for the 10-year yield.

Should these unanticipated movements in financial conditions affect the path for monetary policy? If so, how? The staff memo that you received ahead of this meeting on developments at the longer end of the yield curve reported that spillovers from greater monetary policy accommodation abroad—such as the quantitative easing programs of the ECB and the Bank of Japan—appear to have been an important driver of movements in U.S. financial conditions, depressing longer-term Treasury yields and, likely to a lesser degree, boosting U.S. equity prices. The scatter plot in the middle left that Steve also discussed in his briefing shows that, around the time of ECB policy announcements in recent years, the 10-year Treasury yield has moved, on average, by about half of the movements in the 10-year bund yield. As depicted in the middle-right panel, this co-movement is concentrated in five-year, five-year-forward term premiums, consistent with our views on how QE operates on longer-term yields. In principle, these spillovers could be largely offset by dollar appreciation, but, in practice, the broad dollar has depreciated, on net, since December 2015.

What is a U.S. policymaker to do when confronted with this situation? To the extent that the United States is, in effect, importing financial ease from Europe and Japan, you might feel the need to step up your efforts to scale back accommodation. Although markets over the intermeeting period were focused on the possibility that several foreign central banks might be moving toward a less accommodative stance sooner than previously expected, as Steve noted, we don't expect such a reversal very soon.

The lower-left panel focuses on another factor highlighted in the staff memo as having contributed to lower-than-anticipated levels of the 10-year Treasury yield since you started scaling back monetary policy accommodation. The panel shows that survey estimates of the longer-run level of the federal funds rate have drifted lower in recent years. Such revisions could be putting downward pressure on longer-term interest rates. And, as President Williams noted, rising asset prices caused by lower discount rates associated with a lower r^* do not necessarily stimulate economic activity. As a result, financial conditions may well be less accommodative than a casual look at the longer end of the U.S. yield curve would suggest.

What are the implications of these considerations for your policy decisions tomorrow and at future meetings? As summarized in the first set of bullets in the lower-right panel, spillovers to U.S. financial conditions from monetary policy accommodation abroad could cut both ways. The continuation of accommodative policies abroad may suggest a need for scaling back domestic monetary policy accommodation less gradually. That said, once monetary policy abroad turns less

accommodative, these spillovers would diminish or could go into reverse. Alternatively, if longer-term yields have been held down because the longer-run equilibrium level of the federal funds rate is lower, it could well be that you don't have much further to go to remove accommodation.

The June statement and the draft alternatives and implementation notes are on pages 2 to 13 of the handout. Thank you, Madam Chair. That completes my prepared remarks.

CHAIR YELLEN. Thank you. Questions for Thomas? [No response] Okay. Seeing no questions, we've our policy discussion left. We'll start that at 9:00 a.m. tomorrow, and I guess we're adjourned.

[Meeting recessed]

July 26 Session

CHAIR YELLEN. Good morning, everybody. Why don't we get under way? What I would like to do is open the policy round by calling to your attention two changes to paragraph 5 in alternative B that are indicated in blue in the material that Thomas distributed yesterday. These are changes that were made since Tealbook B was published. After talking to several of you and thinking more about it myself, I decided that paragraph 5, as it was originally written—at least this is my view—sends too little signal that a change in reinvestment strategy is likely in September. And, of course, you're all going to weigh in on that in this round. But my sense is that, if things stay on track, most of you will be supportive of such a change. I'm concerned that without a somewhat stronger signal, there's a danger of our confusing market participants about our intentions and expectations.

So, to provide that signal, paragraph 5—the blue language—contains two suggestions. The first is to change the words "this year" to "relatively soon." These are words that I used in the press conference and again in my *Monetary Policy Report* testimony to indicate or point to September, and it was widely understood to mean that. In reading the market survey—the Survey of Market Participants and other commentary that comes around that I'm sure all of us read—it turns out that that is the exact change that many people are expecting us to make. Another possibility is to add the words "For the time being" at the front of that paragraph—which would be another way of signaling. My own preference, if we were to make only one change, would be to use the words "relatively soon," but I hope you will weigh in on that. And I'm certainly open to doing both changes if you think that's appropriate. But, at any rate, I would very much appreciate, as we go through the go-round, if you would offer your thoughts on those proposed changes. So with that, let's start the go-round with President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. I would have preferred to announce the beginning of balance sheet normalization at this meeting. While that is clearly not going to occur, I would be worried if we do not take action on the balance sheet at our next meeting. Pushing down longer-term interest rates when the economy was very weak was a sensible policy that I strongly supported. But with a forecast that overshoots full employment, likely by a substantial amount; with most financial conditions, including longer-term interest rates, easing in the wake of our first tightenings; and with concerns that the low interest rate environment may be encouraging excessive valuations in some markets, we should not further delay the balance sheet announcement.

A concern may be that such an announcement will be disruptive to financial markets. However, this action has been clearly signaled since the March meeting. The mechanics have been well explained, and market participants seem to understand that great care has been taken to make it a nonevent for market participants. On the other hand, it is possible that debt ceilings and budget talks may provide a more turbulent environment than we currently are experiencing. While the possibility of such turbulence was a good reason to move up the announcement, I do not view it as a reason to delay action further, as the announcement has been structured to be boring even by central bank standards. We need to continue gradually and steadily removing accommodation. The risks seem unduly tilted to running the economy too hot, and we should be taking out insurance against that risk, deviating from that path only in response to a very material change in the forecast.

I support both changes in the statement language that send a signal that we will be announcing a change in balance sheet policy in September. In fact, I would have supported language that made that outcome even more certain. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Harker.

MR. HARKER. Thank you, Madam Chair. I support alternative B as written at this meeting, and I favor the latest change to paragraph 5. I think the use of “relatively soon” will avoid my concern that the original language would move market expectations of normalization from September to December. So I’m all for “relatively soon.”

CHAIR YELLEN. And “For the time being”?

MR. HARKER. I think the one change in the language would suffice. I wouldn’t strongly object to the addition of that, but I’m not sure it’s necessary if we just say “relatively soon.”

September is not that far off, and if we want to avoid surprising markets and preventing the associated risk accompanying that surprise, then the added signal given in the revised language should greatly ameliorate that possibility. If markets are looking toward September, we keep open the possibility of a rate increase in December if conditions warrant. I don’t believe that any of us are in favor of simultaneously starting balance sheet normalization and raising rates. I am not.

The economy appears to be growing above trend, and labor market activity remains robust. Our initial planned changes to the balance sheet are very conservative, and the path to normalization is exceedingly gradual, implying little effect on economic outcomes. As well, beginning normalization should signal our underlying confidence in our outlook, and I believe that we should start the process in the very near future—that is, September. That said, the consistent shortfall of inflation from target is troubling. I am on record for supporting three rate hikes this year, but I may need to reconsider that position if the likelihood of the staff’s and my

forecasts for a gradual rate of return of inflation to target starts to wane. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Fischer.

MR. FISCHER. Thank you, Madam Chair. As usual, I've enjoyed reading the Tealbooks and have been impressed by the skill of the staff in providing us with plausible accounts of what may be happening in the economy. I'd like to thank them for their devoted work and efforts to come up with new and useful insights on the policy rate paths that are being discussed, among them the use of the double normal distribution that puts more weight on upside risks to unemployment than on downside risks and, of course, the explicit reduction of 50 basis points in the estimate of r^*.

Perhaps because we do not plan on making any changes to policy at this time—I'll leave aside the announcements—I have been somewhat uncertain what conclusions to take away from the many interest rate, inflation, unemployment, and economic growth strategies that appear in different parts of the Tealbook, particularly the blue- and black-edged pages, pages 71 to 114 of Tealbook A. Since our June meeting, the unemployment rate has essentially stayed constant at a satisfactory level, and the rate of inflation has essentially stayed constant at a somewhat unsatisfactory level, about 50 basis points below target. The staff continues to believe that we're dealing with a temporary decline in inflation and that there's no great need to change course. I continue to agree with that view, which is to say that I support alternative B. However, we do need to ask ourselves how long "temporary" is and what we will do if this temporary adjustment drags on for too long.

In some cases, the trajectories are the results of an optimal control approach, with a range of loss functions specified on page 113 of Tealbook A. Perhaps in those and other cases, we

could use utility functions to tell us which trajectories produce the optimal outcomes, but we would have to decide on what is the mother or father utility function by which we evaluate all of the paths. Or, to put a related question on the table, what is the connection between what our research can tell us about the expected outcomes of alternatives A, B, and C and all of the trajectories presented in Tealbook A? How is what we do connected to the very professional and very interesting analyses in Tealbooks A and B, in fact?

Well, aside from the foregoing professorial remarks, I have only two points of substance. First, the nominal income-targeting approach discussed in the Monetary Policy Strategies section of Tealbook A is too complicated to be useful. It is used in the July Tealbook to start with a large deficit on the price level such that the inflation rate reaches 2 percent very quickly. But unless there's good reason to choose the starting date and it can thereafter be taken either as a constant or as the outcome of the process that allows individuals to figure out where the path will lie in future years, it inherently produces a path with large uncertainty. Consider, in particular, what people are supposed to assume in an economy coming off a period of inflation overshooting, which will require policy to be tight for some time. How will anyone know what the target nominal income level would be? And not to mention the problem of data revisions, which are particularly problematic in the case of GDP.

I do not support price-level targeting, but I do believe that whatever benefits nominal income targeting in the form presented in the July Tealbook might bring would easily be better achieved by a policy that targets the price-level path. But the main difference between GDP targeting or price-level targeting and the inflation-targeting approach is that the level approaches place the burden of past errors fully on current and future policy, a burden that no one now

assumes policy should automatically carry and which could only complicate our lives rather than increase our utilities.

The second point of substance: As I discussed at the previous meeting, I believe the best approach to starting to reduce our balance sheet would have been to announce today that we will start the process in the month of September. Why do that? Well, President Rosengren has already given us a good explanation of that, and, as Vice Chairman Dudley said yesterday, we've persuaded market participants that we're going to start very small, sufficiently small that the reductions in the balance sheet will hardly be noticed in the trading following the start of our change in policy.

I fear that the amount of ink that has been spent—some of us print things out, although I know most of you don't—on spelling out what we will do when we start is already fogging up the outlook. My preference would have been to clear away the fog and get on with actually starting the rundown of our balance sheet. But in the interest of comity, I can support alternative B today. Now, you'll say, "What is 'comity'?" Well, the ever-useful Google says "1. An association of nations for their mutual benefit." This is not the intended meaning. "2. Courtesy and considerate behavior toward others." That is the intended meaning. [Laughter] Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Mester.

MS. MESTER. Thank you, Madam Chair. I support alternative B and the statement language. I believe the current medium-run outlook, progress on our dual-mandate goals, and the risks to the outlook support the Committee's strategy of gradually normalizing interest rates and the balance sheet. I view alternative B as consistent with this approach, an approach the Committee has been communicating for some time as appropriate.

I appreciate the change that was made to paragraph 5 after Tealbook B was closed. If sufficient groundwork had been done, I would have supported announcing today that we were embarking on our balance sheet normalization plan. But, given that, I strongly believe signaling that the Committee expects to change its investment policy and embark on its balance sheet plan "relatively soon, provided the economy evolves broadly as expected" is the appropriate thing to do at this point, as we're aiming to change our policy at the September meeting. First, it's consistent with our aim to be transparent. Second, it removes some of the ambiguity about our policy. As I said yesterday, reports from business contacts suggest that political and fiscal policy uncertainty is beginning to affect the economic decisions of some businesses and households. It seems to me that it behooves us to remove ambiguity about monetary policy to the extent that we can. Using the "relatively soon" language that Chair Yellen used in her recent testimony engenders some consistency and helps avoid speculation that our intentions have changed.

And, third, I think that by including the language today, we minimize the chance of an oversized reaction in September. If we don't signal today, as we come into September, there's going to be a lot of public discussion of the debt ceiling, and that could increase ambiguity about our September decision. In addition, the ECB meets on September 7, and there's some speculation that it could announce some reduction in the pace of its asset purchases. If we then announce the start of balance sheet normalization in September without having signaled in advance, we may trigger the very type of reaction in financial markets we're attempting to avoid.

Regarding whether to add language in brackets at the start of paragraph 5—that is, the "For the time being" phrase—I'm agnostic. However, I agree with the Chair. I wouldn't want it to be used in lieu of adding "relatively soon," which the Chair used at the hearing. Why mix signals now and risk increasing ambiguity rather than reducing it?

Now, all of this is predicated on our medium-run outlook remaining largely intact—that is, that economic growth is at or above trend, labor markets remain strong, inflation expectations remain reasonably well anchored, and inflation moves gradually back up to our goal of 2 percent on a sustained basis.

One of the benefits of the gradual nature of our interest rate and balance sheet normalization strategy is that it allows for fluctuations in the data that we've seen without necessitating a change in strategy. Had we opted to pursue a more aggressive strategy, it might have needed to be adjusted more in the wake of changes and conditions. Instead, we've been able to follow a consistent strategy even as the data have fluctuated. In a sense, the gradualness of the strategy has already taken into account some of the fluctuations we've seen in the data, so we've been able to be consistent. This consistency has a benefit: It helps demonstrate that we set policy systematically, and that we focus on the medium-run outlook and aren't going to react to small fluctuations in the data that don't materially change the outlook.

Now, in my view, economic developments we've seen continue to support the outlook and gradual normalization. But we always have to consider the alternatives, and I acknowledge that we could have the inflation outlook wrong. It's hard to forecast inflation. We've been undershooting our 2 percent inflation goal for some time. And perhaps the recent data readings are indicating the beginning of a longer-lasting deterioration in inflation and inflation expectations. If evidence accumulates that inflation expectations have materially reversed course, then I don't think delaying interest rate increases a couple of meetings is going to have much effect on inflation. And, as we discussed yesterday, there may be financial stability implications. So in this scenario, it would seem that we would need a more significant change in strategy. Although this isn't my modal forecast, it is worth thinking about what actions,

communications, and/or change in framework would be most effective in raising inflation expectations and moving inflation back to our goal if we find ourselves in such a scenario of a deteriorating inflation outlook. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. And I want to recognize Governor Fischer to just make a brief addition to his previous statement.

MR. FISCHER. Thanks very much, Madam Chair. I wanted to comment on the "For the time being." I believe "relatively soon" definitely ought to be there, and I'd prefer "For the time being" being there because it's a nice way of getting people to actually read the thing. "Oh, 'For the time being'—what the heck does that mean?" Then they'll read the rest of the paragraph.

CHAIR YELLEN. Thank you. President Bostic.

MR. BOSTIC. Thank you, Madam Chair. Under my outlook and current assessment of risks, I support the policy action in the alternative B statement. However, as I noted in the economy round, I think the lack of clarity regarding the inflation situation is troubling. Because of the uncertainty about how the inflation outlook is going to evolve, my chief concern is that we retain conditionality and that this is understood more broadly in the market.

For that reason, I am sympathetic to the inclusion of language in the spirit of paragraph 3 of alternative A. In addition to saying that we are monitoring inflation developments, this language says we're taking seriously the possibility that the recent weak inflation readings will persist. I think adding this language better positions us for a moderation in the expected path of policy, if that appears warranted when we reach the September meeting. That said, my current projection still has one additional rate hike this year, but this action is conditional on my being more confident that the inflation rate will actually recover its movement toward our policy

objective over coming months. So I'll be keeping my eyes trained on that in the next two months.

Regarding the balance sheet, I'm in favor of beginning normalization in September. My concerns that the possible weak inflation may not be transitory are real, but the gradual introduction of this program makes me confident that we should begin this, and that there is likely to be minimal disruption.

I agree with strengthening the signal and support the inclusion of "relatively soon" in paragraph 5 of alternative B. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Evans.

MR. EVANS. Thank you, Madam Chair. I support alternative B. The inflation picture has not improved since we met last month. If anything, the incoming data have made me more nervous about the persistence of the low readings. So I think it's particularly important at this juncture that the Committee avoid actions or communications that could be read as a lack of concern over the inflation outlook.

Indeed, for expressing the inflation concerns, like President Bostic, I found some of the language in alternative A quite attractive, particularly the paragraph 3 commentary that policy is on hold in order to determine the persistence of the recent low readings on inflation. That well summarizes my current strategy. That said, I can support alternative B. Even if not as forceful as alternative A, I think alternative B will firm market expectations regarding a plan that announces the beginning of balance sheet normalization at our September meeting and puts interest rate moves on hold as we assess the outlook for inflation.

If we see inflation beginning to move up in the fourth quarter, I could see raising rates in December. That said, I am more concerned that we will find ourselves in December with core

inflation still stuck at 1½ percent, and I would find it very difficult to support a rate move if inflation is not clearly improving. We cannot risk being viewed as capitulating on our symmetric 2 percent target.

So I support alternative B today as written and, barring any sharp deterioration in the economic growth or inflation outlooks, the current plans for a September commencement in the balance sheet normalization. I favor the single change to paragraph 5 involving "relatively soon." I think that's adequate. Beyond the balance sheet changes, further rate hikes are going to be a tough sell until we see solid evidence that the recent declines in inflation are indeed transitory, and that the path to our symmetric 2 percent target is more firmly in place. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. First Vice President Mullinix.

MR. MULLINIX. Thank you, Madam Chair. My outlook for appropriate policy in the coming months has not changed from the assessment reflected in my SEP forecasts in June. That outlook included two more rate increases this year. With inflation close to our target, the case for continued rate increases did not rely on the level of inflation. Rather, it was based on the economy having essentially achieved full employment while the real federal funds rate remained negative.

The economic outlook has not materially changed in recent months, although the continued fast pace of employment growth has been notable. The softness of inflation has persisted more than I had expected, but I agree with the Tealbook in seeing this as largely due to temporary shocks to specific price categories. Even so, I recognize that the question of whether we are experiencing persistent low inflation is a legitimate one. While today my concern leans more toward resource utilization being too close to the edge than inflation being too far from

target, incoming data will be informative about these two risks and about the appropriate pace of further rate increases. Therefore, I support policy alternative B and would include both proposed revisions to paragraph 5. In that regard, I believe we have positioned ourselves to carry out balance sheet normalization in a way that is largely independent of the path of interest rates. Accordingly, I believe we should announce the beginning of normalization in September, with the actual start of redemptions coming shortly after that announcement. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Powell.

MR. POWELL. Thank you, Madam Chair. I support alternative B. Let me say first that I support both pieces of the blue language. I would be in a similar place to Governor Fischer, which is that I think "relatively soon" is both more important and pretty straightforward. But I would also support the inclusion of "For the time being," in order to help remove any remaining doubt.

The Committee has carefully communicated the plan to begin to shrink the balance sheet. The market has accepted the move as one carefully designed not to provoke much of a reaction. Therefore, I continue to believe that beginning normalization of the balance sheet in September will be appropriate, perhaps with delayed effect until November 1 if a significant debt ceiling impasse threatens.

Although incoming data have yielded a few mild surprises, the economy remains on about the same trajectory. Inflation is the main source of uncertainty. Over the past several years, the staff's inflation models have fit the data pretty well. The current baseline forecast is that inflation will move up close to 2 percent in 2018, because the recent inflation weakness is largely due to transitory factors. As I said yesterday, I find that plausible. But if inflation is

weaker than expected, it might not be wise to raise rates further in December. That decision, of course, is not before the Committee today.

The Committee will also need to carefully balance our continuing exertions to move closer to our inflation target with the need to safeguard financial stability. Over the intermeeting period, the staff have raised their assessment of the valuation pressures in financial markets to the red level, although other areas of financial stability assessment remain at more moderate levels. The staff's analysis also suggests that it is likely that credit growth will accelerate, reflecting current levels of risk appetite.

The tradeoff between inflation and financial stability is not a difficult one today for me, but it may become so. Some argue today that we're "behind the curve" on financial stability and should tighten, while others argue that we're, in effect, "ahead of the curve" on inflation and should stop tightening. I see both of those as real risks that point in different directions, and I think that our current policy path represents an appropriate balance between them that will need careful monitoring. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Bullard.

MR. BULLARD. Thank you, Madam Chair. I support alternative B for today, with a few caveats. I think, generally speaking, the Committee is in fairly good shape for now. I am supportive of going ahead with ending reinvestment in September, provided there are no large surprises on the economy. I do support, accordingly, the blue language in paragraph 5—both the "For the time being" language and the "relatively soon" language.

I remain doubtful that we need to plan for preemptive moves on the policy rate in order to meet our policy goals over the forecast horizon. As of today, it appears unlikely that the inflation situation will change markedly by the end of the year. And on this dimension, I support

President Bostic's suggestion to use paragraph 3 of alternative A instead of the way it's written in alternative B. I think that's a good idea. President Evans commented on that as well. I think that's something to consider. The Committee, in my view, will likely be on pause through the end of the year and into 2018, based on the inflation situation.

I'd like to reiterate to the Committee that the U.S. price level has fallen about 4.5 percent off the price-level path established between 1995 and 2012. If you draw a line through the price level from 1995 to 2012, it's about 2 percent. But we've fallen off that path since then, and that looks likely to get worse as we go through the end of the year. That suggests to me that the future might call for a reassessment of U.S. monetary policy strategy along the lines of price-level or nominal GDP targeting, as was discussed by the staff in the Tealbook. If we were going to do something like that, that would be a major change in strategy, but it may be time that we start thinking about that more carefully.

Barring a major change in strategy, I think our approach as we go forward should be to move to a description of the current level of the policy rate as appropriate for today, and that the current level of the policy rate may remain appropriate over the forecast horizon, barring large changes to the U.S. economy. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Madam Chair. I support alternative B with both amendments to paragraph 5. I believe we should announce the start of the wind-down of our balance sheet in the September meeting, and I think this new language sets us up more clearly to communicate that. Regarding President Bostic's suggestion, for myself, I'm at least one meeting away from being ready to adopt that language. I'd like to see more data over the next couple or

three months before we adopt the language in paragraph 3, alternative A. I might get there eventually, though.

Regarding further increases in the federal funds rate, I intend to be patient and await further information that confirms we're continuing to make progress toward meeting our 2 percent inflation objective. I do believe the cyclical forces are tilted to creating inflation pressure. However, I also believe that the secular forces are powerful and are likely muting inflation pressures, so I intend to observe closely how these forces unfold.

I'm struggling with a dilemma, which I've talked to a number of you about, and I'll just mention it. On the cyclical side, pressures are building. There's no doubt the labor market is tightening. I think it is leading to growing labor shortages, and I think, on a like-for-like basis, it's leading to wage pressure, if you carve out the compositional factors that we talked about yesterday. These forces are certainly susceptible to monetary policy—that is, a higher federal funds rate would tamp this down. On the other hand, my strong view is that the secular or structural forces are very powerful, and, in my view, they're intensifying. Technology-enabled disruption is intensifying, and the effects of globalization, to a lesser extent, are also strong. These are leading to a loss of pricing power—which is widespread, in my view—and a muting of inflation pressures. These secular forces are not so easy to measure. They're also not particularly susceptible to influence by monetary policy.

So as we look ahead, one scenario would be, if we allow the cyclical pressures to build because we're not meeting our inflation target, businesses will face more labor shortages. That should lead to more wage pressure and should lead to margin erosion. To reduce these pressures, businesses will do what they're doing now: They will step up their investment in technology to reduce the reliance on workers and to lower their costs. This cycle may not be all bad, but I'm

not sure. Low interest rates may also lead to other unhealthy imbalances building in financial markets, ultimately leading to growing risks that may be difficult to unwind and prudently manage. And at a certain point, I think, this could be dangerous, particularly if we don't maintain and keep strong macroprudential policies.

So, what I'm talking about with my team and others around this table is, first, do you agree with this cyclical versus secular dilemma? I don't think everyone does, but I think it's worth debating. And, second, if you do agree with this dilemma, how should we be thinking about it from a policy point of view? Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President George.

MS. GEORGE. Thank you, Madam Chair. I support alternative B, including the updated "relatively soon" language in paragraph 5. I think it is stronger and sufficient of a signal of our intent, so "For the time being," I think, could be dropped.

Based on the current economic outlook and the well-communicated balance sheet reduction plans at the June meeting, I could have easily supported an announcement to begin ceasing reinvestments today. My outlook calls for further gradual adjustments to the funds rate. Whether that path should be altered in light of the tension between ongoing strength in labor markets and soft inflation readings will depend on the influence of incoming data on those projections.

I would note that during the first half of this year, labor markets have tightened faster than expected, lowering the median SEP for the unemployment rate at the end of 2018 from 4.5 percent in the December 2016 SEP to 4.2 percent in June. While inflation data have come in softer than expected in the first half, the well-noted influence of transitory factors has resulted in no change to the SEP forecast of core PCE inflation of 2 percent in 2018. The Tealbook forecast

of core PCE inflation for 2018 is also unchanged over the past two meetings. And, as the Board staff's memo illustrates, numerous factors influence short- and medium-run inflation dynamics and point to the limited influence of monetary policy in a period characterized by a flat slope of the Phillips curve.

Finally, as I assess my outlook and future rate path between now and our next meeting, I remain mindful that financial market conditions have become increasingly accommodative even as the FOMC has raised the funds rate three times since December. Thank you.

CHAIR YELLEN. Thank you. President Kashkari.

MR. KASHKARI. Thank you, Madam Chair. I support alternative B, though I agree with President Bostic that the inflation language from alternative A is more appropriate, and I would support that change if others were also supportive.

In the June meeting, I described a tension between faith and data. This tension continues. In my view, we should not let faith in the Phillips curve make us continue making erroneous forecasts of increasing inflation and lead us to both raise rates too quickly and continue to undershoot our inflation target. I thought the staff's memo on inflation was very candid, and I'm going to quote it: "This assumption [of a return to 2 percent] has no real empirical basis; rather, it reflects our conviction that the economy's long-run rate of inflation is ultimately determined by the actions and communications of the monetary authority." I share this conviction, and this is why I think it's crucial that we monitor weak inflation and demonstrate that we are committed to achieving our 2 percent target.

As I listen to all of our discussions, I think we are all looking at this from a risk-management perspective. One risk is the risk of nonlinearity that we've discussed at length, for which there's literally no evidence exhibited in the data today. But I can't say it's a zero risk.

It is a risk, even though it's not in the data. The other risk is that we continue undershooting our target, and there is some evidence that inflation expectations may be drifting. I think that we underappreciate how costly it is if inflation expectations were to drift down. I asked my staff, "If we wanted to raise inflation expectations by 50 basis points, how could we do it?" That was a tough one, and we couldn't think of a good way of raising inflation expectations by a small amount. Why is it costly? It's costly because I think we all acknowledge we're in a low-r* environment. And if inflation expectations drift lower, the power of our primary policy tool gets eroded.

Now, there's been some discussion—President Bullard mentioned that maybe we need to change the inflation regime or the monetary policy regime, and others have argued for raising the inflation target. I think it's very unlikely the public will support us in raising the inflation target. When I travel around and give talks, I get a lot of pushback on our 2 percent target. I can only imagine the firestorm if we were to try to raise the target. So, to me, it's more of an academic discussion than a realistic discussion. Number 1, I don't think the public would support us. Number 2, if we can't hit 2 percent, I don't see why anybody would believe we could hit 3 percent. So I also don't think that's a realistic solution. For both of those reasons, I think 2 percent is going to be our target, here to stay. And we should be working really hard to defend that target, because if we allow expectations to drift, the power of our primary tool gets eroded.

Turning to the SEP—I know this is not an "SEP meeting," but I want to just mention something. I've been critical of mean reversion, but I have to confess that I'm guilty of believing in mean reversion as much as anybody. If you look at my SEP forecasts, they always forecast a two-year-forward miracle of inflation returning to target and policy normalizing. So I'm rethinking my approach to the SEP. I'm not exactly sure what I'm going to do in September,

but I'm trying to get away from just relying on everything reverting back to normal. And it will probably mean that I'm going to end up with a much shallower targeted path for policy in the next submission, but I'm working on that right now.

Lastly, as I turn to the balance sheet, I support announcing our actions in September. If the debt ceiling is a concern, I think we should announce a deferred start date, October or November. I think that takes all of the uncertainty out of it, puts it on autopilot, and lets it happen in the background.

By the way, I'm aware of a disconnect in my thinking. I mean, I'm really concerned about inflation, but I'm also supporting balance sheet normalization. The way I reconcile that is, I don't think the balance sheet is doing a lot of good for us right now, but I do think there are big costs in terms of public confidence in the Committee and in the Federal Reserve. The plan we've designed is very gradual, and I think starting that, whether it's activated in September or shortly thereafter, and letting that go off in the background is appropriate. And then we'll really focus on the federal funds rate in terms of what we do with respect to inflation.

Finally, as for those two changes, I'm fine with them. I think the first change, "relatively soon"—I'm definitely in favor of that. "For the time being" I'm agnostic on. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Williams.

MR. WILLIAMS. Thank you, Madam Chair. I support alternative B with the "relatively soon" modification, and I, too, am comfortable with "For the time being." I was listening to President Rosengren say that he wanted the language to be even stronger. I'm struggling with how you could make this even stronger. I guess you could say "over the next seven weeks." [Laughter] But I actually do think that, in light of the Chair's testimony and the use of

"relatively soon" and "For the time being," there will be no confusion in the markets that we mean September.

Incoming data since the previous meeting continue to indicate that the economy is creating jobs at a rapid pace when we're already past our full employment goal. At the same time, we've received weak readings on inflation. This tension is very likely transitory, and I expect that ongoing labor market tightness will bring us back to our inflation target over the medium term. Assuming that conditions evolve as expected, I think it's appropriate that we continue gradually removing accommodation by announcing our balance sheet normalization in September and an additional rate hike by year-end, by which I mean, I hope, this year's end.

A key issue in considering the appropriate pace of normalization of the funds rate is how one interprets the low readings of longer-term Treasury yields. We discussed that quite a bit yesterday. And, again, the Board staff's memo, as others have mentioned, highlights a number of factors that may be holding down 10-year Treasury yields. Now, I think it can be boiled down to two basic scenarios that I will be following closely. The first is, our asset holdings are having a big effect—on the order of minus 90 basis points, according to the estimates presented in the Tealbook—on the term premium and thereby on 10-year yields. In this scenario, the normalization of our balance sheet will gradually entail a tightening of financial conditions over the next few years. However, in the second scenario, our balance sheet is no longer having a sizable effect on the 10-year term premium, and the low level of yields instead reflects a combination of a very low r^* and, possibly, a persistently lower term premium due to other causes.

One potential reason for a persistently low term premium in the period ahead is that longer-term inflation risks have shifted from being biased upward to being biased downward.

The high-inflation experience of the 1960s and 1970s previously caused investors to demand a large term premium. In contrast, today longer-term risks to inflation may be weighted somewhat to the downside, reflecting the new realities of a globally low *r** and the lower bound. In this scenario, the term premium is likely to stay low even as we normalize the balance sheet.

We can't identify today which scenario is the right one. We'll have to wait until we move forward on balance sheet normalization. Fortunately, though, our approach of gradually raising the funds rate over the next couple of years works well in either scenario. In the first scenario, we want to go slow with rate hikes because we are reducing monetary stimulus along two dimensions at the same time. In the second scenario, *r** is lower than many—or, indeed, all—of us on the Committee currently believe, and the "go slow" approach makes sense because we have a shorter distance to travel to get back to normal. Either way, I view the path embedded in the median projection as a reasonable and robust approach to policy, at least until we get greater clarity on how financial conditions evolve in response to the normalization of our balance sheet. Thank you.

CHAIR YELLEN. Thank you. Governor Brainard.

MS. BRAINARD. Thank you. I consider normalization of the federal funds rate to be well under way, the criterion for commencing balance sheet normalization. Looking ahead, assuming the economy evolves as expected, I favor announcing the change to our reinvestment policy in September, with an implementation date that steers clear of any possible drama associated with the debt ceiling. I like the clarity in the revised language in alternative B that makes clear we anticipate making the change to reinvestment policy "relatively soon," conditional on the outlook. And I have to say, I found President Mester's arguments and

President George's observations on the qualifier "For the time being" to resonate with my own, which is that it is redundant and possibly confusing.

I view the federal funds rate as the preferred active tool because its effect on financial conditions and the economy is more extensively tested—and therefore more precisely understood—than changes to the balance sheet. As a result, I think it's appropriate to set in motion the change in the balance sheet policy. And as long as the economy continues evolving broadly as expected, we would simply allow it to run off in the background at the gradual pace that was decided. Then we would look to future adjustments in the federal funds rate as a means of calibrating the stance of monetary policy in response to ongoing changes in incoming data that may materially affect our outlook.

Once that normalization process is under way, I'll be looking closely at the evolution of inflation before making a determination about the path of the federal funds rate. As we've all been discussing, we've been falling short of our inflation objective over a sustained period. Standard monetary theory would suggest we shouldn't return fully to the neutral rate of interest until we're confident that inflation is on track to return to 2 percent. What does that mean in practical terms? The models that the staff monitors, which they present in the Tealbook, suggest that the short-run neutral rate is currently around zero in real terms. If you add in a trailing core PCE inflation rate of about 1.4 percent, we're really not very far from neutral currently. So unless we expect inflation to move quickly back to target or there are indications the short-run neutral rate has moved up further or is going to move quickly, it appears we could be approaching neutral without too much additional work.

Now, I talked yesterday about how I've been thinking about the likelihood inflation moves quickly back up to target. Thinking the evolution of r^* over the medium term, one

important consideration is the possible effects of balance sheet normalization. If, indeed, balance sheet normalization will boost the level of the 10-year term premium by about 30 basis points between now and the end of 2019, a variety of estimates suggest that that would actually imply a decrease in the short-run neutral rate of interest. And, depending on what foreign central banks do, that could either reinforce or offset that. As President Williams said earlier, I'm not sure we know what's going to happen as the balance sheet starts to run off.

Of course, it's possible other factors will be working to offset the downward pressure on the equilibrium funds rate. That's the case in the Tealbook forecast, with the result that it shows a path of r^* that rises above its long-run value in the medium term. My current hunch is that the short-run neutral rate of interest may not rise much over the medium term, but this is a very open question.

With regard to the longer-run neutral rate, the downward revision in the Tealbook brings the estimate into line with my own forecast, taking into account the likely later and smaller fiscal stimulus than I had previously anticipated. If the neutral rate remains low relative to its historical value, this puts a very high premium, as others have noted, on guiding inflation back up to target. I'm sympathetic with the amendment suggested by President Bostic and echoed by others that perhaps we should be looking at the language in alternative A to signal that this is a real focus of the Committee.

I'm also sympathetic to proposals that have been made around the table that maybe we should be looking more broadly—broadening the aperture—at proposals that might increase the pull of our target. People have talked about nominal income targeting and price-level targeting. Yesterday Governor Fischer talked about the possible merits of targeting a range instead of a point estimate. I'm sympathetic to that, but I would worry that any range with a lower bound

below 2 percent would risk validating expectations the Committee is actually prepared to acquiesce in an underlying rate of inflation persistently below 2 percent.

So, for today, I support alternative B. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. And Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you, Madam Chair. I support alternative B. In terms of language, I prefer, in paragraph 5, making the change "relatively soon." You could also make the additional change "For the time being," but I guess I feel that you don't need two things. One thing is sufficient. If people feel that they want to do both, I don't think it's a big deal. I'm happy to defer to the Chair on this, but I think one change is sufficient.

In terms of President Bostic's suggestion, moving the language from paragraph 3 in alternative A to alternative B, I'm where President Kaplan is. I think it's something that we might want to consider at a future point. But I guess I need to see more evidence on inflation to convince me that we really do have a problem before I'd want to make that change, because people would take that as a pretty significant shift in the expected monetary policy path.

I'm going to continue by making some more general remarks about monetary policy. I found the reaction in the marketplace to our June rate hike quite noteworthy because we got criticized on both sides. On the one hand, some questioned our decision in June to withdraw monetary accommodation, because they talked about how inflation had fallen further below our objective. I guess my reaction to those critics is that I think they give too little weight to the fact that monetary policy is still accommodative and that financial conditions have actually been easing. I also think they don't give enough weight to the long and variable lags that exist between monetary policy adjustments and their effect on the real economy. In particular, if the unemployment rate is below the natural rate of unemployment, it's likely to take some time for

this to manifest itself in the form of higher wages and higher price inflation. Inflation is a slow moving process, and that's especially the case when inflation expectations are well anchored. And it's going to take time to discern shifts in the underlying trend, because the monthly inflation data themselves are quite noisy.

On the other hand, some have argued that we're creating financial asset bubbles by not removing accommodation more quickly, and that our asset purchases have distorted financial markets. On that side, I don't see that financial asset valuations are particularly excessive in the economic environment in which we've been, the environment in which we're seeing steady, slightly above-trend growth and low inflation. To the critique suggesting that our asset purchase programs are distorting asset prices, my response is, that's the whole point of the asset purchase programs. We were trying to depress term premiums in order to provide support to the real economy. The argument that we should shift to a monetary policy regime that avoids distorting asset prices, that is somehow neutral, is not one I find compelling. Monetary policy is implemented to help us achieve our employment and inflation objectives. It does this through its effect on financial market conditions and financial asset prices. Requiring monetary policy to be neutral is essentially saying that we should not use monetary policy to try to achieve the Federal Reserve's dual-mandate objectives.

Finally, some commentators have argued that we should make monetary policy less predictable in order to surprise market participants, in order to generate more market volatility. The idea is that by doing this, we might reduce the degree of complacency among market participants, and that adding some risk to markets would help hinder the development of asset bubbles. I'm not a fan of this idea—although I've thought about it a lot for many years—for several reasons. First, I think there's plenty of potential for surprises for market participants

from the economic environment without the FOMC needing to generate its own artificial set of surprises. The economic outlook changes, and that influences how we respond, and that affects financial asset prices. We don't have to add additional noise to that process. Look what happened in 2016, for example. As the economic environment changed, we responded by tightening much less than anticipated. Second, deliberately degrading the quality of our signal as to our reaction function, would presumably come at a cost in terms of higher risk premiums. And higher risk premiums are real costs imposed on the economy. Third, the advent of a less reliable FOMC would also presumably loosen the linkage between the stance of monetary policy and financial market conditions. Because the transmission of monetary policy works through its influence on financial conditions, I don't see why you would want to deliberately act in a way that makes that linkage even looser.

I've been trying to actually go in the opposite direction in explaining the importance of financial market conditions as a driver of our monetary policy decisions. If market participants can internalize this, then this can be stability enhancing. Shocks that tighten financial conditions mean, all else being equal, we're likely to move a bit slower in terms of removing accommodation. In that case, the slower pace might actually limit the tightening of financial conditions. Conversely, if financial conditions ease, as has been the case this year, then this pushes on the side of going a little bit faster, and this should help tighten financial market conditions. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Well, thanks to everyone for a very thoughtful round of comments. I think our policy decision today is simple. I've heard broad-based support for alternative B. Everyone seems to agree that it would be appropriate or, in the spirit of comity, can accept leaving policy unchanged today.

Looking forward, I heard widespread support for completing the orderly rollout of our balance sheet plan at our next meeting by announcing that we'll begin phasing out reinvestments on, say, either October 1 or November 1. And I think that, by mid-September, we'll have a better sense of which of these dates makes sense. In terms of signaling our intention to announce a change in reinvestment in September, I heard general support for adding the words "relatively soon" in paragraph 5. And on the second proposal, "For the time being," I tried to carefully count as we went around the table, and I heard a very slim majority in favor of making both changes. Of course, a number of you did indicate clearly that you prefer only the one change. For myself, I could go either way. I suppose, having taken that count, my inclination would be to go with the majority decision and make both changes. But let me ask, of those of you whose preference would be to do only "relatively soon," is there anyone who would be very unhappy if we were to make both of the changes?

VICE CHAIRMAN DUDLEY. If you were very unhappy about this, I think you need to seek counseling. [Laughter] This is just not a big deal, in my opinion.

CHAIR YELLEN. Okay. So my proposal would be that we go with alternative B with both of the changes in blue.

As far as the federal funds rate is concerned, I think it would be prudent to hold off on making further changes to the target range until we've seen more inflation data and have had a chance, as a number of you—almost all of you—indicated, to evaluate whether the recent soft readings on inflation are transitory or signal some more persistent soft trend. I heard several of you support the inclusion in paragraph 3 of language that appeared in alternative A. The inclusion of that language would ramp up somewhat our concern about inflation. My suggestion

would be that we not make that change today. But it is language we can certainly consider next time or any subsequent time, if we continue to be concerned about weak inflation data.

I'm assuming that we will not be moving on the federal funds rate in September, when we make the change to our reinvestment policy. But, obviously, we can make changes, depending on what we think the data warranted. I think we have full flexibility on that. My expectation is that we'll wait until December, assuming the data come in more or less as expected. But we retain flexibility on what to do about the funds rate, and we'll need to carefully evaluate incoming inflation data. So let me stop there and ask Brian to review what the FOMC will be voting on and read the roll.

MR. MADIGAN. Thank you, Madam Chair. This vote will be on the policy statement for alternative B as shown on pages 6 and 7 of Thomas Laubach's briefing package, including both changes to paragraph 5 shown in blue. The vote will also encompass the corresponding directive to the Desk as included in the implementation note on pages 10 and 11 of that package.

Chair Yellen	Yes
Vice Chairman Dudley	Yes
Governor Brainard	Yes
President Evans	Yes
Governor Fischer	Yes
President Harker	Yes
President Kaplan	Yes
President Kashkari	Yes
Governor Powell	Yes

Thank you.

CHAIR YELLEN. Thank you. Now we have two sets of related matters under the Board's jurisdiction: corresponding interest rates on reserves and discount rates. I first need a motion from a Board member to leave the interest rates on required and excess reserve balances unchanged at 1¼ percent.

MR. FISCHER. So moved.

CHAIR YELLEN. Thank you. Do I have a second?

MR. POWELL. Second.

CHAIR YELLEN. Okay. Without objection. Finally, I need a motion from a Board member to approve establishment of the primary credit rate at the existing rate of 1¾ percent and establishment of the rates for secondary and seasonal credit under the existing formulas specified in the staff's July 21 memo to the Board. Do I have a motion?

MR. FISCHER. So moved.

MR. POWELL. Second.

CHAIR YELLEN. Thank you. Without objection. Okay. Our final agenda item is to confirm that our next meeting will be on Tuesday and Wednesday, September 19 and 20. And let me finally mention—although 10 o'clock seems early for lunch [laughter], we do have boxed sandwiches and boxed salads available in the anteroom. Of course, we look forward to seeing everyone in September.

MR. FISCHER. Will you keep them until 12 o'clock? [Laughter]

CHAIR YELLEN. Unless they disappear.

MR. FISCHER. Well, congratulations on a new record, Madam Chair.

END OF MEETING