

**Meeting of the Federal Open Market Committee on
October 31–November 1, 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, October 31, 2017, at 1:30 p.m. and continued on Wednesday, November 1, 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
Patrick Harker
Robert S. Kaplan
Neel Kashkari
Jerome H. Powell
Randal K. Quarles

Raphael W. Bostic, Loretta J. Mester, Mark L. Mullinix, 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
Michelle A. Smith, Assistant Secretary
Mark E. Van Der Weide, General Counsel
Michael Held, Deputy General Counsel
Steven B. Kamin, Economist
Thomas Laubach, Economist
David W. Wilcox, Economist

James A. Clouse, Thomas A. Connors, Daniel G. Sullivan, William Wascher, 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, Secretary, Office of the Secretary, Board of Governors

Matthew J. Eichner,¹ Director, Division of Reserve Bank Operations and Payment Systems, Board of Governors; Michael S. Gibson, Director, Division of Supervision and

¹ Attended through the discussion of developments in financial markets and open market operations.

Regulation, Board of Governors; Andreas Lehnert, Director, Division of Financial Stability, Board of Governors

Daniel M. Covitz, Deputy Director, Division of Research and Statistics, Board of Governors; Rochelle M. Edge and Stephen A. Meyer, Deputy Directors, Division of Monetary Affairs, Board of Governors

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

John M. Roberts, Special Adviser to the Board, Office of Board Members, Board of Governors

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

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

Antulio N. Bomfim and Ellen E. Meade, Senior Advisers, Division of Monetary Affairs, Board of Governors

Shaghil Ahmed and Joseph W. Gruber, Associate Directors, Division of International Finance, Board of Governors; David López-Salido, Associate Director, Division of Monetary Affairs, Board of Governors

Stephanie R. Aaronson, Burcu Duygan-Bump, and Glenn Follette, Assistant Directors, Division of Research and Statistics, Board of Governors; Christopher J. Gust, Assistant Director, Division of Monetary Affairs, Board of Governors

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

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

Youngsuk Yook, Principal Economist, Division of Research and Statistics, Board of Governors

Jonathan E. Goldberg, Senior Economist, Division of Monetary Affairs, Board of Governors

Randall A. Williams, Senior Information Manager, Division of Monetary Affairs, Board of Governors

James Narron, First Vice President, Federal Reserve Bank of Philadelphia

² Attended Tuesday session only.

David Altig, Kartik B. Athreya, Mary Daly, Jeff Fuhrer, Ellis W. Tallman, and Christopher J. Waller, Executive Vice Presidents, Federal Reserve Banks of Atlanta, Richmond, San Francisco, Boston, Cleveland, and St. Louis, respectively

Marc Giannoni and Paolo A. Pesenti, Senior Vice Presidents, Federal Reserve Banks of Dallas and New York, respectively

Sarah K. Bell, Satyajit Chatterjee, and Jonathan L. Willis, Vice Presidents, Federal Reserve Banks of New York, Philadelphia, and Kansas City, respectively

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October 31 Session

CHAIR YELLEN. Well, good afternoon, everyone. Let's get started. But before we do so, I'd like to note that the Board's photographer will take photos of the meeting later today, toward the end of the economic go-round. For information security, it would be helpful if at that time you closed or placed something over any confidential documents. I might also note that, after we adjourn tomorrow, the FOMC Secretariat will provide a brief introduction to a new version of SDS. Your attendance is optional, but we will have a presentation. Okay. This meeting, as usual, will be a joint meeting of the FOMC and the Board. I need a motion to close the meeting.

MR. POWELL. So moved.

CHAIR YELLEN. Thank you. Without objection. As you all know, Randy Quarles has joined the Federal Reserve as the Board's Vice Chairman for Supervision and as a member of the Federal Open Market Committee. Randy brings deep experience in banking, finance, law, and government, including his service as under secretary and assistant secretary of the U.S. Treasury Department. Randy, welcome to the FOMC. We all look forward to working with you.

MR. QUARLES. Thank you.

CHAIR YELLEN. I also want to note that this will be the last FOMC meeting for our secretary, Brian Madigan, who, after completing one final assignment—namely, drafting the minutes of this meeting—plans later this year to retire for a second time. [Laughter]

This is the 166th FOMC meeting that Brian has attended. Brian began his long and distinguished career at the Board in 1979 and rose quickly through the ranks. He joined the newly formed Monetary Affairs Division in 1987 as one of its charter members. Brian was

promoted to division director and also was appointed secretary of the FOMC in the summer of 2007, just as the first signs of the impending financial crisis began to appear. Within weeks after assuming these responsibilities, Brian was literally working around the clock in supporting the Board and the FOMC in addressing all of the major challenges we faced, including the development of the liquidity programs and asset purchase programs and all of the issues associated with the formulation, implementation, and communication of monetary policy intentions at the effective lower bound. It is no exaggeration to say that there are few, if any, other people in the country that could have managed this range of responsibilities so expertly during the wartime atmosphere of the financial crisis.

In 2010, with 30 years of service—and, counting the crisis, about 130 years of service [laughter]—Brian decided to retire. We were fortunate to lure him back to the Federal Reserve in 2015 for one more stint as secretary of the FOMC, a job that has required that Brian somehow devise language that all of us can agree fairly and accurately describes what has been discussed at each meeting. As usual, Brian has performed flawlessly in that capacity.

Brian, throughout your career, you have exemplified the highest ideals of selfless service, leadership, dedication, and intelligence that this nation can hope for in a public servant. I know I speak for everyone on the Board and the FOMC in saying that we have the deepest respect and gratitude for your service, especially during the darkest period of the financial crisis. We wish you the very best in the future and hope that you'll now have a lot more time to spend with your family and especially your two new grandchildren.

MR. MADIGAN. Thank you very much. [Applause]

CHAIR YELLEN. Now, turning to our formal agenda, we will soon have an opening in the position of FOMC secretary, and I would like to nominate James Clouse to serve in that capacity.

As I think you all know, Jim, who currently is FOMC associate economist and deputy director in the Division of Monetary Affairs, is a highly talented and experienced economist and a widely respected Federal Reserve leader. After receiving his Ph.D. from Northwestern University and serving a four-year stint as an army officer, Jim joined Monetary Affairs in 1989, and he has since risen steadily through the ranks. He also was deputy assistant secretary at the Treasury Department for one year, where he oversaw Treasury debt financing. Over the past three decades, Jim has developed deep expertise in central banking broadly, the Federal Reserve in particular, and most especially in monetary policy implementation. I might note that Jim is also an excellent writer, a skill that is critical for the FOMC secretary.

Jim's selection as secretary would be effective on November 26, a few days after the minutes of this meeting are published. Jim would vacate his position as FOMC associate economist at that time. I anticipate that an officer from the Division of Monetary Affairs will be nominated to fill that associate economist position at our organizational meeting in January. Consistent with our most recent practice for the position of secretary, we would announce Jim's selection this week rather than wait until the minutes are released. Do I have a motion on Jim's selection?

VICE CHAIRMAN DUDLEY. So moved.

CHAIR YELLEN. Second?

MR. POWELL. Second.

CHAIR YELLEN. Thank you. Without objection. Okay. Let me now call on Simon to start us off on the Desk briefing.

MR. POTTER.¹ Thank you, Madam Chair. Over the intermeeting period, expectations regarding a 25 basis point rate hike by year-end firmed. While surveys and market pricing continue to indicate that a near-zero probability is placed on an increase at this meeting, the consensus on a third hike in the 2017 SEP dots published in September as well as recent economic data have reportedly strengthened the perceived prospects of a December rate hike. The probability assigned to an increase in the target range at the December meeting rose from around 50 percent in the September surveys to 60 percent in our most recent surveys, and federal funds contracts imply a probability of more than 80 percent of a 25 basis point rate increase in December. The top-left panel of the first exhibit compares the evolution of market-implied expectations ahead of each rate hike in the current tightening cycle. As shown by the red line, market pricing currently implies a higher probability of a rate hike than was the case at this point in previous episodes.

Along with the firming in near-term expectations, the implied path of the target rate steepened somewhat, as shown by the shift from the light blue line to the dark blue line in the top-right panel. In the Desk surveys, the median respondents' modal expectations of the target rate, shown by the gray circles, are well aligned with those of the Committee, as represented by the median of the SEP dots. In addition, mean expectations derived from the surveys' probabilistic questions, shown by the blue diamonds, are aligned with market pricing. In a new survey question this cycle, we asked respondents to decompose the two-year U.S. dollar overnight index swap rate into market expectations of the effective federal funds rate and a term premium. The results indicated that most market participants view this term premium as mildly negative or around zero, roughly consistent with the mean expectations in the second panel.

Regarding fiscal policy, the release of further details on a tax plan and the anticipation and eventual passing of a budget resolution in the Congress were viewed by market participants as supporting domestic asset prices over the period. While modal expectations regarding deficits over the next few years have not changed meaningfully in the Desk's or other surveys, contacts have noted that the probability placed on a fiscal stimulus has risen, the effect of which can be seen in the changes in asset prices shown in the middle-left panel. The Russell 2000 index, composed of higher-taxed corporates, outperformed the S&P 500 index, and both short- and longer-term real Treasury yields increased while inflation compensation was little changed. The increase in U.S. yields led to a widening of interest rate differentials between the United States and major trading partners, contributing to an appreciation of the dollar over the period. Despite its recent appreciation, the trade-weighted dollar remains roughly 6 percent below its January peak.

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

One factor not cited as affecting longer-dated yields was the announcement of changes to the Federal Reserve's reinvestment policy at the September FOMC meeting. Market participants have been correctly anticipating a slower pace of balance sheet expansion by major central banks, and this view was further validated by the ECB announcement that it would lower purchases to a pace of €30 billion per month in 2018. The middle-right panel illustrates that, in 2018, growth of central banks' balance sheets in advanced economies will slow markedly as the Fed's balance sheet declines and ECB purchases are halved. However, growth will still be positive under current expectations that the Bank of Japan will continue to expand its balance sheet, albeit at an annualized rate of roughly ¥25 trillion less than its stated pace of about ¥80 trillion a year.

Unlike in 2013, emerging markets have proven resilient to recent changes in major central banks' balance sheet policies, as shown in the bottom-left panel. While the recent increases in U.S. yields and appreciation of the dollar have led some investors to view emerging markets investments with more caution, inflows to emerging market assets have remained robust. Market participants continue to indicate that the emerging markets are supported by high domestic yields in an environment of low volatility, expectations of a gradual pace of policy normalization by major central banks, and better global growth prospects, especially in China.

Over the intermeeting period, China's 19th Party Congress concluded and left President Xi in a stronger position to push forward an economic reform agenda. Consequently, market participants' views of broad macropolicy continuity and their desire to continue a gradual deleveraging in the region were reinforced. Confidence in the outlook for China has led the relative cost of protecting against RMB depreciation to its cheapest level since early 2014.

In contrast to the relative stability in emerging markets overall, concerns over NAFTA negotiations led the Mexican peso to depreciate more than 7 percent against the U.S. dollar and was a major contributor to dollar strength against other emerging market currencies, as shown in the bottom-left panel. Additionally, domestic political risks are seen to be building in Mexico as a presidential candidate perceived as being less market friendly has gained momentum. The depreciation and volatility of the Mexican peso led Mexican officials to announce that they will utilize their FX hedging program for the second time this year.

Risks in Europe and, to a lesser extent, North Korea also received attention but did not have a significant effect on U.S. asset prices. Implied volatility remains at the very low end of historical averages for nearly all asset classes, and risk assets continue to rise. U.S. equity prices reached new nominal highs over the intermeeting period, and credit spreads are at their tightest levels of the year. Market participants are increasingly citing benign fundamental stories for the increase in risk asset valuations and low volatility. While unease about "rich" pricing in corporate debt and commercial real estate is still present, there is more comfort with equity market valuations, in conditions of continued low rates and low economic volatility.

In recent months, the Desk has increased its outreach to firms using quantitative trading strategies to understand the extent to which such strategies might be supporting this benign market environment, thriving in it, or both. One of the more interesting observations from this outreach has been the very high risk-adjusted returns, as measured by Sharpe ratios, for strategies that buy equities on the dips. A simple illustration of how this might be affecting stock market dynamics is shown in the bottom-right panel: The S&P 500 index is currently experiencing an unprecedented ratio of days on which it is up $\frac{1}{2}$ percent or more compared with days on which it is down $\frac{1}{2}$ percent or more. Some market participants express concern that this pattern will lead to complacency and a greater risk of a large future decline in equity valuations in the event that investors and strategies are surprised by a sequence of down days in the market and react by liquidating positions. On the other hand, we have also heard of traders expressing the view that this pattern is consistent with a stock market that can only go up. Dan Covitz will discuss valuations some more in his briefing. And now I will turn it over to Lorie to discuss reinvestment, money markets, and the foreign portfolio.

MS. LOGAN. Thank you, Simon. I'll begin on your second exhibit. Reinvestment operations proceeded smoothly over the intermeeting period. In the MBS market, we completed the reinvestment operations for principal payments of agency debt and MBS through September, reinvesting all but \$4 million due to rounding in the previous operation, and on October 16 we initiated the first monthly purchase period with caps. As directed under the caps, we constructed the October purchase calendar to allow \$4 billion of principal payments to mature without reinvestment.

The top-left panel shows realized and projected principal payments from agency debt and MBS in the context of the announced caps. The dark blue bars are projected reinvestments, the gray bars are projected redemptions, and the red line represents the Committee's announced caps. The Desk's current baseline projection implies that the cap on MBS is expected to stop binding during the fourth quarter of 2018, shortly after it is phased in. Under this baseline projection, the MBS portfolio declines about \$180 billion through 2018. However, MBS cash flows are subject to considerable uncertainty because of the embedded prepayment option in the underlying mortgages. The blue shaded area of the panel shows the Desk's projected paydowns under scenarios in which long-term interest rates deviate 100 basis points in either direction from current forward rates. The asymmetry of the shaded area relative to the baseline reflects our expectation that prepayment speeds would increase considerably more if interest rates were to decline 100 basis points than they would decrease if interest rates were to rise by the same magnitude. As you can see, depending on the future path of interest rates, the pace of decline in the MBS portfolio can vary substantially, and the time when the MBS cap ceases binding can range from late 2018 to late 2020.

The top-right panel shows a similar chart for Treasury securities. Again, the dark blue bars are rollovers, the gray bars are redemptions, and the red line represents the cap. One key difference, as you know, is that the cash flows associated with particular Treasury securities are known with certainty. The current maturity profile

of SOMA Treasury security holdings suggests that the cap on Treasury securities is expected to continue periodically binding after it is fully phased in, as shown by the bars exceeding the red line. We expect the Treasury securities portfolio to decline about \$250 billion through the end of 2018. Together with the Desk's baseline MBS paydown projection, this would imply a total portfolio reduction of roughly \$430 billion by then.

With respect to Treasury security rollover operations conducted over the intermeeting period, today will mark the first actual redemption of SOMA Treasury securities holdings, as we had no midmonth maturities in October. The first reduced bids were submitted earlier this month for securities issued today.

As Simon mentioned, there has been no apparent reaction in Treasury yields or MBS option-adjusted spreads to the announced change to the reinvestment policy or to the very modest reduction in MBS purchases so far. Market participants have noted broadly that the policy change was well communicated and widely anticipated. That said, contacts have indicated that the ultimate market effect will depend on the marginal buyers and future issuance in the Treasury security and mortgage markets. With respect to Treasury debt issuance, market participants will be particularly attentive to the Treasury's quarterly refunding announcement tomorrow morning for any guidance on how it plans to replace SOMA rollovers. Contacts expect the Treasury will ultimately increase both its bill and coupon security issuance. However, they also anticipate that near-term changes in bill supply will largely be driven by debt ceiling dynamics.

As shown by the dashed line in the middle-left panel, bill supply is expected to increase in the next few weeks but then drop notably around the December debt ceiling date as the Treasury aims to reach a particular level of its cash balance. The Desk staff estimate that bill supply will decrease approximately \$75 billion in early December—about half as much as observed ahead of the debt ceiling reinstatement in March. The decrease in bill supply might lead to a decline in repo rates and an increase in overnight RRP take-up, along lines similar to what we saw in March, but it is not expected to be disruptive to money markets. Furthermore, the Treasury can employ extraordinary measures to create additional borrowing capacity and remain under the statutory limit for some time, leading market participants to believe that the debt limit will not become binding until late in the first quarter of 2018.

With respect to recent overnight RRP activity, shown in the middle-right panel, take-up since the previous FOMC meeting averaged about \$135 billion excluding quarter-end—slightly higher than the previous period—and overnight RRP operations continued to go smoothly. Funding markets were orderly throughout the intermeeting period, including over quarter-end.

As shown in the bottom-left panel, outside of quarter-end and an idiosyncratic one-day overnight bank funding rate “print” of 1.17 percent, the effective federal funds rate and overnight bank funding rate consistently “printed” at 1.16 percent over the intermeeting period.

Regarding the foreign portfolio, the Desk rebalanced maturing euro proceeds over the course of the month to match the new target asset allocation, as discussed at the previous meeting. Recall that, under current market conditions and the new recommended parameters, this year's target allocation, shown by the light blue dashed bars in the bottom-right panel, involves slightly higher holdings of cash and slightly lower holdings of both shorter- and longer-term securities than in the target allocation set last year, shown by the dark blue bars. This target allocation will remain in effect until the start of the next investment cycle in October of next year.

With regard to the yen portfolio, we continue to place proceeds from securities holdings in a deposit account with the Bank of Japan at a zero percent rate of interest, which is only offered to foreign central bank accounts with specified limits. This passive approach will also lead to higher holdings of cash.

Finally, the appendix contains a list of all the small-value exercises conducted over the intermeeting period, including a test TDF operation, along with a list of upcoming exercises. Thank you, Madam Chair. That completes our prepared remarks. We would be happy to take any questions.

CHAIR YELLEN. Questions for Simon or Lorie? [No response] Nothing? [No response] Okay. If there are no questions, then we need a vote to ratify the domestic open market operations conducted since the September meeting. Do I have a motion to approve?

VICE CHAIRMAN DUDLEY. So moved.

CHAIR YELLEN. Thank you. All in favor? [Chorus of ayes] Any opposed? [No response] Thank you. Okay. We're ready to move along to our economic and financial briefings, and David Lebow will start us off today.

MR. LEBOW.² Thank you. I'll be referring to the materials in this packet titled "Material for the Briefing on the U.S. Outlook." As you can see from the first panel of your "Forecast Summary" exhibit, we've made no material changes to our GDP projection since our September forecast. The incoming spending data have done little to alter our assessment of the underlying pace of aggregate demand, and we still see growth at a solid rate of about 3 percent in the second half of this year. Indeed, BEA's advance estimate of third-quarter real GDP growth, which was reported last Friday and is shown as the blue dot in panel 1, came in at 3 percent, in line with our Tealbook projection. Growth is then projected to step down to 2½ percent next year and to decelerate further over the forecast period as monetary policy gradually

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

tightens in a mechanical application of our assumptions about both the rule for the federal funds rate and balance sheet normalization.

In the near term, our forecast now incorporates the estimated effects of Hurricanes Irma, Maria, and Nate, which hit after the September Tealbook was finalized. However, as you can see by comparing lines 1 and 2 of the table to the right, the revisions that we made this round to the estimated effects of Hurricane Harvey ended up offsetting the effects of folding in the later storms.

Regarding the labor market, the September employment report was noisier than usual because of the effects of the hurricanes. We think that the reported decline in payroll employment of 33,000 in September reflected the storms having temporarily subtracted about 200,000 jobs in that month. That estimate is consistent both with a jump in the number of people who reported themselves as being out of work due to bad weather and with state-level data showing payroll declines in both Texas and Florida. As you can see from line 3 of the table, we expect those hurricane-related declines to be reversed in October and November. September data in the household survey, which the BLS believes were not much affected by the hurricanes, showed a further decline in the unemployment rate and an increase in the participation rate. We expect the unemployment rate to remain at 4.2 percent through year-end.

Looking beyond the near term, with real GDP projected to rise faster than its potential, the unemployment rate—panel 3—declines to a level that is more than 1 percentage point below our estimate of its natural rate. The pace of this decline in the unemployment rate slows gradually over the next couple of years, reflecting the projected deceleration in real GDP.

Panel 4 provides an update of unemployment rates by race or ethnicity. In line with the aggregate unemployment rate, the unemployment rates for these various racial and ethnic groups have improved, on net, since the beginning of this year and are now close to the levels seen just before the previous recession. Thus, the differentials in jobless rates across these groups have more or less returned to their pre-recession levels. In his briefing to the Board last week, my colleague Ivan Vidangos provided an analysis of observable characteristics correlated with these differentials. One interesting finding from his work is that very little of the large gap between unemployment rates for blacks and whites is associated with differences in observable characteristics, such as age or years of schooling, whereas a relatively large fraction of the gap between Hispanics and whites appears to be associated with differences in completed years of schooling across the two groups.

Panel 5 shows four of the various compensation measures that we follow. This morning we received the September ECI—the black line—which rose 2½ percent over the past 12 months. We view the current pace of ECI gains as roughly in line with what we would expect in conditions of an increasingly tight labor market, relatively subdued productivity gains, and low trend inflation. By contrast, we see the recent downshift in the productivity and costs measure of hourly compensation growth—the blue line—as largely anomalous. We would attribute most of it to the

fact that this is a much noisier series—a feature that is apparent even on the basis of the smoothed version presented here.

In all, the recent news on the real economy has been largely positive. But this silver lining does have a touch of gray, which is that price inflation remains surprisingly low and below the Committee’s objective.

Yesterday we received BEA’s estimate of monthly PCE prices through September, which implied a 12-month change of 1.6 percent for the headline index, the black line in panel 6, and of 1.3 percent for the core index, the red line. These readings were as we expected in this Tealbook, having seen the CPIs and PPIs for September. However, compared with the September Tealbook, inflation was once again a little below our expectations—another in the string of downward surprises we’ve received since early this year. In the months ahead, we now expect the 12-month change in core PCE inflation to hold roughly steady at 1.3 to 1.4 percent, while total PCE inflation drifts a little lower. Then in March of next year, both measures are expected to move up to 1.6 percent as the extremely low reading recorded this past March drops out of the 12-month change calculations.

Panels 7 and 8 on the next page provide a broader summary of the inflation outlook. I should note that these panels show quarterly changes at an annual rate rather than the 12-month changes you were just looking at. In the chart to the right, you can see that we project core inflation to move back up in the quarters ahead, but that we’ve carried a bit of this year’s downward surprise into next year. The remaining charts on this page provide some insight into our thinking.

Panel 9 plots core PCE price inflation together with the staff’s judgmental estimate of its underlying trend, by which we mean the level that we expect inflation to return to when there is no upward or downward pressure arising from resource utilization and absent any supply shocks. We view this trend as ultimately being driven by the inflation expectations of wage and price setters. We think this trend has been basically stable in recent years at a level a little below 2 percent. The staff assumes that the trend will eventually drift up toward the Committee’s 2 percent objective.

Under the staff’s baseline interpretation, inflation dynamics in recent years have reflected the interplay of this stable trend along with the effects of certain “fundamental” determinants that can act to push inflation away from its trend—namely, resource utilization and the effects of supply shocks such as movements in energy or import prices. In panel 10, the red, green, and blue portions of the bars provide a rough quantitative breakdown of these factors—both over the past few years and over the projection period—that is based on the staff’s judgmental rules of thumb. The yellow portions represent factors other than these fundamentals. Loosely speaking, you can view them as akin to model residuals. In 2016, these other factors made a sizable positive contribution to inflation. Conversely, the downward surprise seen so far this year leads us to anticipate a rate of core inflation for 2017 as a whole

that is somewhat lower than would be implied by the contributions of its more fundamental determinants.

The staff's baseline projection views 2017's downward inflation surprise as largely transitory. This interpretation is similar to how we treated 2016's higher-than-expected inflation, which, in the event, did prove to be short lived. But as I noted, we did decide to carry a bit of this year's surprise into next year. In 2016, much of the upward surprise to core inflation could be traced to a large increase in the nonmarket component of PCE price inflation, which tends to fluctuate erratically and carry little signal for future inflation, and also to an unusual jump in prescription drug prices. Some of this year's negative surprise has also come in the form of price movements that look idiosyncratic—the outsized drop in prices of wireless telephone services seen earlier this year most strikingly, as well as some reversal of last year's jump in prescription drug prices. But a reasonable portion of this year's miss appears to be spread more broadly across the market-based components of the index and so might prove to be a bit more persistent than 2016's surprise. In all, we thought that taking a bit out of our 2018 inflation forecast would better balance the risks associated with the projection.

As an alternative approach to gauging the signal from this year's inflation surprises, panel 11 presents results from a statistical model developed by my colleague Matteo Luciani. This model formally decomposes movements in core PCE prices into movements that are common across items versus movements that are specific to particular items or idiosyncratic. Results generated by this model were shown in the memo on recent low inflation that was sent to the FOMC in July. The model also bears some similarity to the Federal Reserve Bank of New York's factor model for inflation, the underlying inflation gauge. The red line shows the 12-month change in the model's estimated common component and the black line shows actual core inflation, so the model's idiosyncratic component is the difference between the two lines. Thus, this model also suggests that idiosyncratic shocks have recently held down core inflation after having provided a large boost to inflation in 2016. I should emphasize that the model's estimate of the effect of idiosyncratic shocks is not the same concept as the yellow "Other Factors" bars in the inflation decomposition from panel 10. For example, the responses to slack or to supply shocks could be viewed by this model as either common or idiosyncratic, depending on how widespread their effects are across different prices. That said, the results from this purely statistical exercise seem consistent with our analysis, and they give us some additional confidence that much of this year's downward movement in core inflation will prove to be transitory. Beth Anne will now continue our presentation.

MS. WILSON.³ Thank you. I will be referring to the materials titled "Material for the Briefing on the International Outlook." It is not often that one gets to brief on Halloween, so although I resisted the urge to disguise myself in costume, I couldn't resist a suitably thematic approach to my remarks. And the theme is "International Tricks and Treats." I'll begin with the treats. As seen on slide 1, since last year's

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

Halloween, foreign growth, shown to the left, has surprised us on the upside, and the dollar, on the right, has surprised on the downside.

The left chart on your next slide shows that, consistent with these developments, exports have come in well above what we had anticipated a year ago, and that strength is expected to continue. Robust exports and surprisingly weak imports, not shown, have contributed to a sizable boost in the contribution of net exports to U.S. growth, shown on the right. Instead of subtracting almost $\frac{1}{2}$ percentage point from GDP in 2017, as we thought last year, trade is likely to add $\frac{1}{4}$ percentage point and be only a slight drag thereafter. Basically, it's like getting a $\frac{3}{4}$ percentage point of a GDP-sized Hershey bar dropped in your goody bag.

Regarding slide 3, we are also getting a treat from more buoyant global conditions spilling over into U.S. financial markets. Improved global activity has supported foreign equity indexes, shown to the left. Stronger global growth and the weaker dollar have also affected U.S. equity prices. One way in which this can be seen is by looking at the performance of more internationally exposed firms. The chart to the right plots the difference between stock returns of U.S. firms that have a high share of foreign sales minus the returns of those that have a low share. Starting in mid-2014, more internationally exposed U.S. companies underperformed for quite a stretch as the dollar strengthened. However, these firms have outperformed since the spring.

Flipping to slide 4: The benign foreign outlook and reduced recession risk abroad have also bolstered market sentiment more generally. Indeed, in the left panel, we see a positive correlation between the probability of foreign recessions and option-implied volatility in U.S. equity markets, or the VIX. Research that Juan Londono recently presented to the Board finds that models of the VIX that include foreign factors, the green line on the right, such as the foreign probability of recession and foreign IP account much better for the current low level of the VIX, the black line, than do models relying only on U.S. variables, shown in orange. In other words, unlike in years past, instead of haunting U.S. markets, foreign developments are booo-sting them. [Laughter]

Another factor influencing financial markets, as discussed in slide 5, has been monetary policy in the advanced foreign economies. Rates in the AFEs have remained very low this past year, as shown on the left, and AFE balance sheets, on the right, are generally continuing to rise. We anticipate only a very gradual reduction in this accommodation, a view that has been reinforced by last week's ECB decision to extend purchases.

Regarding your next slide, there are good reasons to believe that such foreign policies are lowering our yields. As seen in the scatterplot on the left, looking at the one-day window around ECB announcements, the IF staff find a positive relationship between changes in German 10-year yields and U.S. 10-year yields. Comparable exercises for other AFEs suggest an average pass-through of about $\frac{1}{2}$, with some cross-country variation. Updating work we've shown you earlier, we can use these spillover results, along with estimates of the effect of foreign QE on own-country

rates, to get some sense of how cumulative asset purchases abroad are affecting our 10-year yields, the right chart. This calculation, albeit rough, suggests foreign purchases have likely pushed U.S. 10-year yields down notably from where they would be otherwise. I leave it to you to determine whether this particular spillover is a trick or a treat: It promotes U.S. economic growth but may exacerbate already stretched asset valuations and runs counter to your efforts to tighten financial conditions.

Another source of spillovers from abroad, discussed on slide 7, could be through inflation. The low level of inflation rates across many economies has led some to ask whether the low inflation readings in the United States may reflect the influence of a common global factor beyond those already accounted for in our models. In his pre-FOMC briefing last week, Andrea De Michelis presented work looking into this question. He estimated a global component of inflation, which he calculated as the first principal component of core inflation across nine advanced economies since the early 1990s, shown as the black line in the chart to the left. In the past, this measure of global inflation has explained a significant fraction of the variance of national inflation rates, including in the United States. However, this variable does not enter significantly into our inflation models for the United States, and Andrea found little evidence that shifts in global inflation are responsible for this year's downtick in U.S. inflation. As seen on the right, the global component of core inflation, the solid black line, moved up this year, while the unexplained portion of U.S. core PCE inflation as discussed by Dave just now, the orange bars, turned negative. While there could be other channels through which global factors weigh on U.S. inflation, by the measure here, we would not put low global inflation in the "trick" category.

There are other ways we could be tricked, however, as discussed on slide 8. While many have been spooked by the thought that inflation will remain weak, in the Risks and Uncertainty section of the Tealbook we explore the risk that the Phillips curve reawakens abruptly abroad and that AFE inflation rates jump. In that case, AFE central banks could, in their surprise, jerk rates up more than our model would suggest. If this happens, we think sovereign bond yields would rise, credit spreads widen, and the dollar fall as market participants quickly reposition. The resulting lower foreign demand and tighter financial conditions would weigh on U.S. economic activity and put downward pressure on inflation, notwithstanding the weaker dollar. While not a *Nightmare on Elm Street* scenario, it does amount to a block of houses handing out raisins and pencils to trick-or-treaters [laughter] and would damp the current festive mood accordingly.

The next international risk, discussed on slide 9, does have more of a reoccurring nightmare feel to it. To paraphrase *Poltergeist 2* regarding political risks in Europe, "They might be baaack." [Laughter] The recent rise of populist and antiestablishment parties, as well as the Catalan independence movement, could set in motion a new wave of political instability. So far, the market response has been contained, and we have built in only a small drag from this in our euro-area baseline forecast. But should political conditions deteriorate, we could expect a weakening in investor confidence in European institutions that would fuel financial stress and lead

to sizable flight-to-safety flows into dollar assets. In our simulation, which is a milder version but more likely probably than the euro-area crisis earlier this decade, AFE real GDP growth runs $\frac{1}{2}$ percentage point below the baseline, increased uncertainty about the foreign outlook boosts the dollar—basically undoing the depreciation we’ve seen this year—and U.S. growth and inflation take a moderate hit.

I’d like to end with another way we’ve chosen to evaluate potential tricks from abroad through the lens of our “International Financial Stability Matrix,” reviewed on slide 10. As Dan will discuss more broadly, this round was also our quarterly assessment of financial stability. On the international side, we did a full review of foreign financial stability vulnerabilities and risks. Our overall assessment remained “Moderate,” with the escape of Brazil from its growth graveyard helping to improve its assessment. But we are still wary about most EMEs, including China, where debt levels are sending shivers down our spines. We also added a new category shown in the last column, called “Prominence of Risks,” to account for relatively well-defined near-term events that represent salient risks but are not well captured in the standard matrix categories. These include geopolitical tensions in the Korean peninsula and NAFTA negotiations and upcoming elections in Mexico. For these two countries and several others, we find the “Prominence of Risks” to be “High.”

Finally, as reviewed in your last slide, we spent considerable time building new tools to assess the strength of transmission of financial stress from the matrix countries to the United States. A memo we sent you as part of the QS process details the myriad of judgmental and quantitative approaches we used to gauge such transmission. The bottom line is that, not surprisingly, outside of China, transmission to the United States is stronger from advanced economies, because of their larger financial markets and greater number of hosted G-SIFIs. This is good news, for as we saw in the previous slide, AFEs tend to have lower vulnerabilities and less prominent risks. That said, while the transmission of individual EMEs seems weak, their collapsing in a pack would likely put fear into global and U.S. markets.

So what’s the bottom line? While we are happy to report that, unlike in years past, the international contribution to your outlook bag will not be rocks, we remain alert to the fact that there are a number of perils that could make our benign foreign forecast as elusive as the Great Pumpkin. And with that, I turn it over to Dan.

VICE CHAIRMAN DUDLEY. Good luck, Dan. [Laughter]

MR. COVITZ.⁴ Don’t get too excited. Thank you, Beth Anne. Before I turn to my exhibits, recall that in July we raised our assessment of valuation pressures to “Elevated” but nonetheless viewed the overall vulnerability of the financial system to be “Moderate.” At that time, we also noted that asset valuation pressures had yet to, but could at some point, be accompanied by elevated levels of leverage and other

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

financial system vulnerabilities, which in turn could amplify any corrections in asset prices.

My first exhibit reviews our current assessment of valuation pressures. As noted in the top-left panel, valuation pressures have increased a bit from already elevated levels. In addition, valuations appear somewhat stretched even when measured relative to the low level of interest rates. For example, in the equity market, price-to-forward-earnings ratios, shown to the right, have remained elevated, particularly for smaller corporations. Indeed, the price-to-forward-earnings ratio for small-capitalization stocks, the red line, is now at about the 98th percentile of its historical distribution, while the respective ratio for the S&P 500 index, the black line, is at its 85th percentile.

To assess equity valuations relative to those of Treasury securities, the middle-left panel plots an estimate of the required return on equity, the black line, and the expected real yield on 10-year Treasury securities, the red line. The gap between the two lines, the staff's estimate of the equity risk premium, has been narrowing for a few years, narrowed further in recent months, and now stands at about the 22nd percentile of its historical distribution. In other words, investors currently appear to require unusually low premiums to induce them to hold equities rather than Treasury securities.

In addition, as can be seen to the right, our estimate of the risk premium on high-yield corporate bonds—which measures the extra compensation above what a hypothetical risk-neutral investor would require to hold speculative-grade corporate bonds rather than Treasury securities—has declined further in recent months to the low end of its historical distribution.

In CRE markets, shown in the bottom-left panel, spreads of capitalization rates to Treasury yields have also moved down and now stand at the low end of their post-crisis ranges, though significantly above their levels in 2006 and 2007. The premiums for multifamily properties, in green, have exhibited the sharpest declines, although these declines reflect moves in capitalization rates that seem outsized and we think could be revised. And credit standards for CRE loans at banks, which tightened this summer, were about unchanged in the most recent Senior Loan Officer Opinion Survey on Bank Lending Practices. In residential real estate markets, not shown, prices have continued to rise but do not appear out of line with rents.

The last panel on this exhibit gives an empirical sense of how much high valuations might boost the degree to which asset prices could fall in response to an adverse shock. The analysis, conducted by Eric Engstrom of the Board staff, provides estimated distributions of two-year-ahead asset price changes using monthly data from 1985 to today, both unconditionally and conditional on valuations at the beginning of each two-year period. The results suggest that negative moves in asset prices could be larger now than has typically been the case. For example, with regard to equities, the unconditional 10th percentile of the distribution of two-year-ahead price changes is negative 16 percent—that is, 10 percent of the time, stock prices

have fallen about 16 percent over two years. However, conditional on current valuations, the 10th percentile for two-year stock price moves is negative 36 percent, more than twice the unconditional decline. For high-yield corporate bonds, the 90th percentile of yield changes is an increase of 175 basis points. Under current valuations, the 90th percentile is an increase of 300 basis points. This simple analysis abstracts from all other financial conditions but suggests that the potential fall in asset prices in response to a shock could be large.

My next exhibit considers whether valuation pressures have been accompanied by leverage or maturity transformation that could amplify the adverse effects of a fall in prices. The short answer is “no.” The long answer, summarized in the top-left panel, is that the staff continues to view borrowing by households and businesses as moderate, financial leverage as low, and maturity and liquidity transformation as low as well.

The figure to the right shows the ratios of debt owed by households and businesses relative to GDP. The top line of the stacked plot indicates that total debt outstanding relative to GDP has been relatively flat in recent quarters, as the ratio for households, depicted by the orange region, edged down a bit further in the second quarter. Credit growth to households with subprime credit scores has been particularly weak. In contrast, the credit-to-GDP ratio for nonfinancial corporate businesses, the purple region, has expanded. Indeed, aggregate net leverage of nonfinancial corporations—defined as the book value of debt less cash and cash equivalents over the book value of assets and shown by the black line in the middle-left panel—remained at historically elevated levels through the second quarter. There are some reasons for partly discounting the high levels of leverage: The 75th percentile of the distribution of firm leverage, the red line, is not elevated, and high-yield corporate bond issuance, not plotted, has slowed markedly in recent months. Even so, we continue to view business leverage as a caveat and, thus, one possible channel by which a shock to valuations might be amplified.

In contrast, financial leverage appears to be low, and liquidity at financial firms appears ample. As noted in the middle-right panel, banks have substantially increased their capital and liquidity cushions with the implementation of the post-crisis reforms. The largest firms are, of course, subject to our stress tests, which feature quite substantial declines in asset prices. Looking beyond banks, insurance companies also appear well capitalized, though pockets of vulnerabilities exist related to their use of funding asset-backed securities agreements, or FABS, and securities lending programs. A possible source of increasing financial leverage is hedge funds. The September Senior Credit Officer Opinion Survey on Dealer Financing Terms showed that a modest net fraction of dealers reported hedge funds had increased their use of leverage.

The bottom-left panel provides another perspective on financial system leverage—the issuance of private-label asset-backed securities. Such securities embed leverage and can lead to a buildup of maturity transformation outside of banks. The chart shows that such activity is small by historical comparisons, largely due to

the lack of recovery in CDOs and private-label residential mortgage securitizations since the financial crisis.

To the right, outstanding asset-backed commercial paper—which is issued by conduits that have, in the past, funded long-term assets with short-term paper and, thus, were subject to investor runs—is only a small fraction of its peak level of \$1.2 trillion. Furthermore, money market fund reforms passed last year induced a significant and persistent contraction of assets under management at prime money market funds—not shown—and available data indicate only modest growth in runnable money fund substitutes. That said, open-end bond mutual funds, also not presented here, offer liquid claims against relatively illiquid assets—a story we’ve told a number of times—and so have the potential to amplify a correction in corporate bond yields.

On balance, the perspective I’ve offered in this briefing suggests that while the potential for large drops in asset prices exists, such drops do not seem likely to be amplified by substantial deleveraging or problems with the functioning of the financial system. This is why the staff chose to assess the overall vulnerabilities in the financial system to be at a moderate level, the same as in July. For your reference, the overall staff assessment is summarized in the heat map on my final exhibit. Thank you. That concludes our prepared remarks. We are happy to answer questions.

CHAIR YELLEN. Questions for our various presenters? President Rosengren.

MR. ROSENGREN. My question is on financial stability. And thank you for the briefing memos that you provided before the meeting. My question actually wasn’t in what you just presented, so I hope it won’t be an unfair question, but one of the charts that you had in that packet was a chart that showed the ratio of commercial real estate to total assets—it’s chart 24 in the memo “CRE from an institutions perspective.” And what it showed was that if you look at the 25 largest banks, it’s basically been flat—in other words, it hasn’t been a big deal for the largest banks. That’s quite consistent with stress tests that are quite severe, discouraging large banks from holding a lot of commercial real estate. The chart also had a second line for banks that were not in the top 25—and for those banks, the ratio has gone from 15 percent to 23 percent. Their CRE assets are roughly \$1.4 trillion.

So the overall sense I got from reading the memo was that you weren't particularly worried about commercial real estate. And the question that came to my mind was, if you have widespread failure of small institutions, can that be a financial stability problem, or in the way staff is defining financial stability, can it only be a financial stability problem if it's one of the largest banks? So to what extent can an aggregation of small banks that are leveraged be a financial stability problem or, at least in the staff's view, do you only view it as a large bank issue?

MR. COVITZ. I think we don't view financial stability just as a large bank issue. We do think, if there are a sufficient number of small banks that are leveraged, yes, that would constitute a concern. I think we do have to somehow try to aggregate up the amount of leverage in the financial system. So if you aggregate up the small banks that you think you have exposures to and it doesn't feel like it's a big enough piece of the overall system, then we might make a judgment that the leverage in the overall financial system isn't particularly high. But I think we absolutely do consider their leverage just as much as the leverage of other institutions.

MR. LEHNERT. That's right, President Rosengren. The chart that you're pointing toward defines large banks as the top 25 institutions. And, as you know, the fraction of intermediation that's accounted for by that set of institutions has really grown over time. Just thinking about financial stability from the perspective of an interruption of the resilience of the intermediation function of the financial system, you put, over time, on that basis alone, more weight on the larger institutions.

Below chart 24, there's a pair of charts showing concentration across firms. I think the other thing to note with respect to smaller institutions is that 25 years ago, when a variety of institutions encountered difficulties in commercial real estate, for a variety of legacy legal

reasons, diversification across geographies was really not as advanced as it is now. So even with the increased concentration in CRE among smaller institutions, we think that the same kind of very intense local effect is going to be less of a problem this time around.

CHAIR YELLEN. President Kashkari.

MR. KASHKARI. Thank you, Madam Chair. David, regarding the U.S. outlook, on your page 2, chart 9, you show core PCE price inflation and its underlying trend. I think I heard you say—I want to make sure I got it right—that the underlying trend is really about inflation expectations. Is that right? And could you tell me what the underlying trend is? And why do you forecast it to be increasing? I can understand inflation increasing as the output gap widens, but why are you forecasting the trend to increase?

MR. LEBOW. Okay. The underlying trend is based on the sense that we think inflation dynamics in recent years can be reasonably well explained by, in fact, a trend that is stable. Now, I said that I connected that with inflation expectations. Theoretically, conceptually, that seems like a plausible connection. The behavior of several measures of longer-term inflation expectations, indeed, as you know, pretty much flattened out, essentially—

MR. KASHKARI. Or are falling.

MR. LEBOW. Well, starting a couple of decades ago, essentially flattened out at about the same time that estimates of a trend had flattened out, and obviously the theoretical connection between inflation and expectations is a mainstay. I would view the connection between the two as circumstantial. We don't know for sure that expectations is the thing driving this trend, but that's our working assumption.

MR. KASHKARI. Okay, but then if you look at chart 11 with the common component, you offered this as evidence that the inflation surprise of the past six months is likely transitory, but the common component is still 1.5 percent.

MR. LEBOW. That's right. That's consistent with many purely statistical univariate models of inflation that estimate an underlying trend that is lower than 2 percent, maybe in the neighborhood of 1.5. So this model is, I think, fairly consistent with that.

Now, as far as assumptions about this trend in the future are concerned, we have for some time been assuming that this trend would eventually start to move up toward 2 percent. I think it was starting around three years ago—I went back and looked in our Tealbook projections—that we started saying that 2018 was about the time we would start to see a movement up.

So where does that come from? At the most conceptual level, it's the view that this Committee ultimately determines where inflation is in the economy. But just saying that doesn't tell you over what time period, nor what exactly is the mechanism that brings that about. But what has been underlying our projection is the idea that when the labor market reaches a certain degree of tightness, we would start to see inflation moving up, and that would be about the time we would start to see some upward drift in inflation expectations that would help push this underlying trend higher.

So here we are now approaching 2018. We are seeing the tighter labor market, but inflation has been surprisingly low, and we characterize measures of inflation expectations as mostly remaining stable—if anything, a little bit lower, not higher.

So it's safe to say, I'm a little nervous about this projection of the trend moving forward. It's worth one-tenth over the next three years. That's how much it adds to our inflation projection. The fact that we took down our inflation projection a little bit, that we carried

forward a little bit of the downward surprise into next year, could be viewed as a signal that we're a little nervous about this trend. Obviously, it's possible that this could be something more persistent, in which case you might say, "Well, a more persistent weakness would be consistent with a lower trend than we have."

MR. KASHKARI. Thank you.

CHAIR YELLEN. President Bullard.

MR. BULLARD. Thank you, Madam Chair. This is for Beth Anne Wilson. I'm looking at page 10, "Other International Risks: International Financial Stability Matrix." I just want to make sure I understand the new, "Prominence of Risks" column. I know we talked about this last time, about how South Korea would get low marks on the assessment for October. But then we go to the new column, and they have "High," and you're attributing that to tensions on the Korean peninsula. How should I understand the "Low" for South Korea and then the "High," and maybe some of the others with "High" in the "Prominence of Risks" column?

MS. WILSON. If you think about the goal of the financial stability matrix as looking at the resilience of foreign financial systems to shocks, not necessarily the likelihood of shocks occurring, then that would capture what we do in our overall assessment.

MR. BULLARD. Okay. For South Korea, "Low" then means the corporate sector is pretty healthy, banks are healthy, that kind of stuff.

MS. WILSON. Exactly. We have six criteria that we look at. We look at the financial sector, we look at the nonfinancial, we look at sovereign vulnerabilities, external vulnerabilities, valuation levels, and effect of institutions—sort of how robust their institutions are. If we look across that, South Korea looks to have a very low level of vulnerability. However, it does have this big risk looming.

We, too, were uncomfortable, and a number of you raised concerns about how to deal with these proximate risks within the context of this analysis. And so what we decided to do was add the “Prominence of Risks” column so that we could capture things like Brexit, NAFTA, elections, and, in the case of South Korea, the tensions on the Korean peninsula.

MR. BULLARD. Okay. And are you also making an assessment that a risk like that is not feeding back currently to the South Korean economy?

MS. WILSON. Right.

MR. BULLARD. So if it was, then you’d be up at “Moderate” or “High” for South Korea in the first column in October.

MS. WILSON. If it was feeding back in ways that we could capture in the financial sector—if it was causing a pullout of available funding, if it was doing something to sovereign vulnerabilities, if it was affecting the quality of the institutions in a number of channels, we would put that more into the IFSM assessment. But right now we’re not seeing in the markets a lot of spillover from that risk to these other underlying characteristics.

MR. BULLARD. And so am I correct then for the United Kingdom, the “High” mark in the “Prominence of Risks” column is due to the Brexit situation?

MS. WILSON. Correct.

MR. BULLARD. And there you’ve got some feedback coming to the actual economy, so you put that at “Moderate” for the—

MS. WILSON. Right. I wouldn’t attribute all of the “Moderate” in the United Kingdom to Brexit. There are other grounds besides Brexit for seeing pressures in the United Kingdom—an elevated housing market, for instance. We were doing it, I think, in a sort of kluge way before—we were putting it in quality of institutions or we were trying to squeeze it into the sort

of standard categories. Now we take it out and more clearly indicate there are these proximate known risks that are separate and, in some cases, can spill over to others. So that's how we've chosen to do it, and it's a standalone category to give a richer assessment of the vulnerabilities.

MR. BULLARD. Okay. Just one follow-up here. For Italy we've got "Notable" for October, and then the "Prominence of Risks" is "High." So how should I interpret Italy?

MS. WILSON. Italy has very weak growth. Its banking sector continues to be extremely vulnerable. It's not profitable, and it has high levels of nonperforming loans and sovereign debt. So there are a number of developments that make Italy "Notable" in terms of its assessment of vulnerabilities. And on top of that, you do have political stresses with upcoming elections, with a rise of sort of anti-EU parties, and we wanted to have a place at which we could note that there are some proximate risks coming from Italy that actually increase our assessment of its vulnerability.

MR. BULLARD. I see. Okay. Thank you.

CHAIR YELLEN. President Mester.

MS. MESTER. Beth Anne, where would Spain show up on here? Because you don't have Spain listed. Is it because you don't think it's important, or would you add Spain and put it under the "Prominence of Risks"?

MS. WILSON. The way that we've chosen these particular countries is, we've looked at a variety of indicators for their importance in terms of the global economy, in terms of global financial markets, and in terms of spilling over—connections with the global economy and with the United States. In that case, Spain is not one of the top countries in terms of its economic and financial connections with both the global economy and the United States. In some cases, we have added countries to be more representative. So we've added Turkey, even though it doesn't

rank very high in geopolitical connections, to give you a richer sense on the emerging market side.

On Spain, if conditions continued to look very vulnerable, if it looked like Spain were a country we needed to focus more seriously on, both in terms of the spillovers to the euro area and the spillovers to the United States, then we view the matrix as a living matrix, and we have the capacity to add and subtract countries and to add columns. For example, in the first run we didn't include Germany, and we've just added the "Prominence of Risks" column.

Regarding Spain, obviously political stresses are heightened there right now. Surprisingly, we're not seeing the kind of financial market spillovers right now that would necessarily elevate it to its own entry, but that doesn't mean that we're not looking at it closely, and that we're not looking at the channels of contagion closely.

MS. MESTER. But even if you don't add it, it would feed back. If it gets to that point it would show up in here, in the sense of the—

MS. WILSON. Right. It would feed back. The reason France and Germany are in "Prominence of Risks" as "Medium" instead of "Low" is because we have a sense that the euro area is still not completely stabilized politically. And we recognize those risks could affect countries, so Spain would be a part of that.

MS. MESTER. Thanks.

CHAIR YELLEN. Further questions? [No response] Okay. Seeing none, there is next an opportunity to comment on matters pertaining to financial stability, and we have a few people who have indicated they'd like to comment. Let's start with President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. I'm going to talk a little bit about commercial real estate again. I thought the staff did a very nice job with the memos they

provided. They highlighted that valuations are high and that exposure on the part of large banks has not grown particularly. But looking at the same set of charts, I come to a different conclusion, and I thought it was useful to provide an alternative viewpoint, to respectfully disagree with where the Board staff comes out.

So my definition actually is quite similar to the definition that was provided for financial instability. It's any situation in which loan supply is interrupted to the extent that the intermediation process is significantly disrupted and the real economy is significantly affected.

By my definition, the credit-crunch period in the late 1980s was an episode of financial instability. While credit from small and mid-sized banks with large exposures to real estate was the source of the disruption—not credit from the largest banks—the disruption was large enough to have macroeconomic consequences. The reduction in credit supply originating in small and medium-sized institutions was a large part of the headwinds in monetary policy that Chairman Greenspan highlighted during that period. As of 1989, quarter 3, banks outside the top 25 institutions had 15 percent of their assets in commercial real estate loans, and the CRE capitalization rate was 7.9 percent. By 1992, the capitalization rate had risen to 9.5 percent, as CRE prices fell faster than rents, and 1,025 banks and savings and loans had failed. I attended hearings all over New England at that time listening to borrowers unable to get credit. As of 2006, quarter 4, banks outside the top 25 institutions held 23 percent of their assets in commercial real estate loans at an average CRE cap rate of 7 percent. By 2010, 338 institutions had failed, and the cap rate had risen to 8.6 percent. Another 185 institutions failed in the subsequent four years.

Because of the failures of the largest financial institutions, the failures of these smaller institutions received less attention but were, nonetheless, amplifying the problems. Today banks

outside the top 25 institutions hold 23 percent of their assets in real estate loans, with average cap rates of 6.1 percent. Compared with the two previous periods of financial instability, this CRE exposure is in line with or higher, and the cap rates are quite a bit lower.

What simulation would I want to see to determine whether all of this is a benign development? Consider a simulation that has commercial real estate prices fall, as in the previous CCAR, coupled with a significant recession. Add the assumption that falling commercial real estate prices motivate the GSEs to no longer provide support for commercial real estate—specifically, the multifamily segment—as their losses mount and as we know they have no capital cushion. Assume we need to lower the funds rate to its effective lower bound, which collapses net interest margins for all banks.

In such a scenario, loans outside of commercial real estate are quite likely to be stressed as well, and it is likely that wholesale funding will dry up. Because many large banks and fintech firms rely on such funding, I am skeptical that these lenders will find lending into a collapsing market attractive at other than fire-sale prices.

In the scenario that I'm envisioning, we would simulate the effect on bank failures, the regional pattern of failures, and the response of banks to diminished capital ratios that likely encourage them to shrink. We would then estimate the effect of this financial problem on the real economy.

My concern is that, indeed, overall credit intermediation would be disrupted, with significant deterioration of the real economy. Note also that the Federal Reserve's reputation as a steward of the economy and a bank supervisor might well suffer as collateral damage during such an event. If this simulation shows that exposure at small and medium-sized banks poses a

serious risk, including risks to the real economy, we should find additional ways to address this issue. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Madam Chair. I'm just going to make a few observations regarding asset valuations, which will basically parallel what Dan and Simon discussed, but I find them interesting.

Today the U.S. stock market rough measure of total U.S. capitalization is approximately 140 percent of U.S. GDP. This is a measure I've liked to watch over the years. This is the highest level of valuation relative to GDP since the 1999–2000 peak of the tech boom. My own view is, the expectation of lower-for-longer interest rates, particularly along the yield curve, as well as a substantial amount of global liquidity have been major catalysts for this route. But in addition to valuation, the one thing that is beginning to strike me more is, we have not had a 3 percent drop in the S&P since last fall. This level of U.S. market stability is actually unprecedented, although it masks substantial shifts in sector market caps, particularly between disrupted and disruptors, which have seen a big shift in market cap beneath this calm surface.

By the way, this level of lack of volatility is indicative of other associated risk markets. The closest corollary in recent history to this stability is the Japanese stock market of 1988 and 1989. I had the misfortune of moving to Japan in 1990 and living through this, which went for about 15 months and had a low volatility much like the current U.S. stock market. At the time, it was thought that easy monetary policy and lax financial regulatory policies were catalysts for that rally. Of course, Japanese P/Es also were much higher than today, but that market peaked at 39,000 in late 1989, went down 50 percent over the next 12 months, and ultimately declined 80 percent.

We're very different than Japan, and I don't expect this to happen, but I think it pays to note that low volatility and sustained market stability for an extended period are highly unusual, especially to this extent, and maybe, to me, now starting to be a little ominous. I would note, as we've discussed before, that low volatility tends to be associated with markets rising, and volatility tends to spike when markets decline. Because more strategies today are based on buying low-volatility assets using leverage, when selling does occur, volatility is likely to rise, and this is likely to trigger more selling and deeper declines, as I think Dan alluded to in his analysis. This is not to say that these trends can't or won't continue for some extended period of time. It's very possible they will. And, of course, selling catalysts are often hard to predict. To me, the most likely ones are a term rate shock or some type of geopolitical shock or dislocation that might affect credit spreads.

I'm watching all of this and also would note, as has been already said, that a decline, in and of itself doesn't worry me as much as an associated debt buildup in the form of straight debt derivatives or, more likely for me, liquid securities that quickly become illiquid in a stress scenario.

So what to make of all of this is hard to say, but I note it. And in that regard, though, there are some things that do strike me. I think the country has been very well served by strong macroprudential regulation of larger systemically important financial institutions—in particular, strong and regular stress testing and capital requirements. And while I am in favor of comprehensive review of regulation, and particularly relief for small, mid-sized banks and a review of Dodd-Frank and the Volcker rule, I think as we do this, I would be loath at this point to ease capital requirements and regular stress testing for the large institutions.

Given the stress level of asset valuations, I think these tests should help us, along with other actions, to monitor for excessive debt buildup or other excesses that will become more apparent in a stress scenario. And I understand they may not help us get much visibility, though, into the shadow financial sector, which we don't directly regulate.

This, to me, begins to reinforce the wisdom of letting our balance sheet run down as we're doing. But it also is starting to strengthen the argument, for me, of continued gradual removals of accommodation in order to avoid getting into a catch-up situation, which might cause the FOMC to need to raise rates much more rapidly and help create the so-called rate shock scenario I referred to earlier. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Brainard.

MS. BRAINARD. Thank you. The latest quarterly assessment of financial stability views increasingly stretched asset valuations as an elevated source of vulnerability, and I share that concern. History suggests that elevated asset valuations pose a much greater risk to financial stability when they're associated with high leverage. Because the elevated asset prices that we see today are occurring against a backdrop of mostly limited leverage and maturity transformation, the staff assesses that the risk of dangerous spillovers from a drop in asset prices is reduced. This assessment provides no compelling rationale at present for monetary policy to deviate from medium-term dual-mandate considerations out of financial stability concerns.

The subdued financial-sector leverage and limited maturity transformation that are providing an offset to high asset valuations did not come about by accident. They're the direct result of the regulatory reforms and better risk management in response to the crisis. Strong capital standards have helped keep financial-sector leverage well controlled, and the enhanced liquidity requirements, including the implementation of the liquidity coverage ratio and the

anticipation of the net stable funding ratio, have helped limit maturity transformation within systemic institutions, while money market reform has also made an important contribution.

Together, these requirements have improved the resilience of our financial system. That is particularly important in today's "new normal," in which the neutral rate of interest is likely to remain low for an extended period. By its nature, such an environment is conducive to asset valuations that are elevated, and a number of analysts have expressed concern that these aspects of the "new normal" may make the financial system more vulnerable to the buildup of leverage bubbles. The experience of the past 20 years suggests we should take this concern very seriously.

With equilibrium real interest rates likely to remain lower than in the past, it is very important that we keep in place guardrails that make the financial system more resilient against the kinds of risks associated with sharp reversals in asset prices of the magnitudes that the staff just presented or the buildup of leverage in the nonfinancial corporate sector.

Earlier discussions of this Committee indicated broad agreement that monetary policy isn't the preferred way to address such financial imbalances. Macroprudential tools are the preferred first line of defense, which should, in principle, enable monetary policy to remain focused on price stability and macroeconomic stabilization.

Today's stronger capital and liquidity standards, together with stress tests that can be calibrated relative to the cycle, are helpful macroprudential policies through the cycle, but we need to be especially vigilant now because of some inherent pro-cyclicality. It's precisely when asset prices are high that future losses are also most likely to be high and the loss-absorbing capacity of a robust capital buffer is most needed. If asset valuations continue to rise, the Board

may need to consider building additional buffers through the macroprudential tools that were created for this purpose, such as the countercyclical capital buffer. Thank you.

CHAIR YELLEN. Thank you. Governor Quarles.

MR. QUARLES. Thank you. There has been a fair bit of discussion about asset prices and stretched valuations. I certainly agree with all of the factors that have been discussed here, as well as some that may not have been.

The spread of CRE cap rates to Treasury yields is at post-crisis lows. Junk bond spreads are at the 15th percentile of their historical distribution. Estimates of the risk premium on equity markets have narrowed. They're in the bottom third of their historical distribution. We just passed the 30th anniversary of the '87 stock market crash. And if you look at the surveys that Robert Shiller started distributing immediately after the crash, the fraction of investors who think that stock prices are high relative to their fundamentals is at its highest level since the dot-com boom.

So, I think it's very clear that asset values are high relative to fundamentals.

Unfortunately, the only projection that one can reliably make from that conclusion over the near term or even the medium term is that prices are going to fall or go up or stay the same.

[Laughter] So the question is, what will be the effect on the system of any of those three events?

We can't be certain which it would be.

If prices fall, some people lose a lot of money. Maybe a lot of people lose a lot of money. The question is whether the second-round effects of those losses will be larger than expected. The classic example is the one that President Rosengren was referring to, of a credit crunch followed by an asset price decline. Governor Powell had called me down to Washington during the period that President Rosengren was referring to, so I remember it very well.

The differences between now and then, I think, are also clear. We have banks with much higher capital throughout the system. The banks that have those high CRE concentrations actually account for a smaller portion of lending now than they did 25 years ago, which I think is material. There's a lot more geographic diversification than there was 25 years ago because of regulatory change that has happened since then. So I think it's clear that the system is much more resilient than it was the last time that we had a significant decline in CRE asset values and the possibility of credit crunch following that.

Suppose asset prices don't decline. They remain high over the near term. Perhaps they go up. History suggests that such booms rarely end well, principally because they result in complacency on the terms and conditions of lending secured by those assets.

From what we can currently see, there's no evidence that suggests a real pickup in risky lending or any material deterioration in the terms and conditions of lending. Particularly, if you look specifically at commercial real estate, I think we could conclude, again, that there hasn't been particular erosion of terms and conditions on those loans. Among nonbanks, LTVs on loans in newly issued CMBS pools are continuing to decline, although they aren't declining as fast as prices are rising.

Now, the last time I made statements that assets were overvalued but the system was strong, I ended up having a lot of explaining to do in my confirmation hearing. [Laughter] So I'm not saying that we should be complacent or that there's nothing to worry about. There's a lot of scope for further analysis, for ongoing research across a range of these issues. But I do think that those factors related to the stability of the system, under the current asset valuations, are something that we should take into account.

CHAIR YELLEN. Any further contributions on financial stability? [No response]

Okay. Then I think we're ready to move along to our economic go-round, and let me first call on President Bullard.

MR. BULLARD. Thank you, Madam Chair. I want to organize my remarks on the economy today on the basis of three themes. The first is real GDP growth and related issues. The second will be comments on the Erceg et al. memo titled "Some Implications of Uncertainty and Misperception for Monetary Policy." And the third will be some remarks on the December rate increase probabilities and the idea that we are, at this point, in my opinion, overcommitted to a rate increase.

So let me start with real GDP growth. It does appear to be somewhat faster than in recent years, according to tracking estimates for the second half of the year, and the staff has this penciled in as well. Q3 growth shows a surprise to the upside in the initial report but could be revised. I again heard a lot of optimism from Eighth District contacts, which seemed to reinforce a perception that the economy is growing somewhat faster. District businesses seem to be more disposed to capital investment than previously. I'm sympathetic to attributing a portion of the more robust real GDP growth outlook to promises for deregulation and tax reform, leading to more business investment than otherwise. So this could lead to a more robust productivity growth environment.

Despite all that, however, I think the jury is still out concerning the validity of this story. I have several reasons for caution, and I do think, for purposes of monetary policy planning, we should always be very cautious about interpreting the recent data. First, year-over-year real GDP growth is about 2¼ percent right now, which I assert is not statistically different from the post-crisis trend rate. Some of the Q3 growth came from business inventory investment, which you

could interpret as accidental. I think some hurricane recovery may have occurred in the third quarter instead of the fourth quarter, so I think that could be a factor.

My District contacts have indicated, not surprisingly, that the health-care industry has been importantly affected by increased uncertainty this year and that that's unlikely to abate soon. So you've got that bubbling in the background.

And, finally, the jobs report was minus 33,000. We did our own state-by-state analysis at the St. Louis Fed. My staff concluded that if there had been no hurricane, the jobs number would have been about 115,000 for September, which would have been disappointingly low. That would indicate underlying slowing in the pace of jobs growth without any hurricane interference. In my mind, this 115,000 number for September is more consistent with the year-over-year growth rate of payrolls, which is now just 1.2 percent. It has been declining since January 2015—coming up on three years of decline in the year-over-year growth rate. So I think the broader picture is slowing jobs growth, not faster jobs growth, and, in fact, is getting to such a low rate that you might consider it the trend pace of jobs growth for the 2 percent growth economy.

So the bottom line on real GDP growth is that the jury is still out on whether the economy is meaningfully breaking away from its post-crisis trend pace of growth, which is close to 2 percent. We'll find out more in the months ahead. To the extent that faster growth becomes the norm because of better investment and higher associated productivity, that does not by itself suggest higher inflation ahead. It may require adjustments to the Committee's policy stance, but only because the short-term safe real interest rate may be rising in such an environment. And, indeed, the one-year real rate of return has been rising recently and could continue rising into the future.

I consider the U.S. economy overall to still be in the low-inflation, low-growth regime, but there are some upside risks to the real rate stemming from the possibility of faster growth as I've just described it.

Let me turn now to remarks on the Erceg et al. memo. I want to thank the staff for the memo. I appreciated the analysis and the work that went into it. The memo documents nicely in figure 1 the shrinking coefficient on unemployment in a traditional Phillips curve regression. It now appears that that coefficient is very close to zero, meaning there is little detectable feedback from unemployment to inflation in recent U.S. data. This result is, as I understand it, not limited to the United States, but prevalent in many places around the world. My take on this result is somewhat different from the direction in the memo, so I want to outline my thoughts.

One way to interpret the declining coefficient on unemployment in Phillips curve regressions is that the result is due to the onset of implicit inflation targeting in the United States and around the world beginning in the mid-1990s. We formalized our inflation target in 2012, but I assert that we were unofficially inflation targeting before that.

Before the 1990s, countries did not specify explicit inflation targets, and, consequently, central bank policy was harder for private-sector participants to discern. Many ideas about Phillips curve empirical regularities came from this earlier era. I like to date implicit inflation targeting in the United States to about 1995, which is when the Committee attained a 2 percent inflation rate and maintained it on an ongoing basis. Over the following 10 years, inflation didn't deviate very far from 2 percent.

Standard New Keynesian theory tells us that the better a central bank becomes at inflation targeting, the less likely it is to observe an empirical relationship between inflation and real variables like unemployment. A limiting case would be that inflation is perfectly at the target all

the time, even as shocks buffet the economy. Inflation in that case would have no variation at all and so would appear to be unrelated to real variables in these kinds of regressions. This appears to be approximately what has happened for inflation in inflation-targeting central banks around the world. Inflation has tended to stay closer to target during the inflation-targeting era and have less variability than in the pre-1995 era. The relationship with real variables has broken down empirically, as figure 1 shows.

What are the lessons for policymakers? I see three. First, it can be unwise to rely on empirical relationships as fixed and immutable when fundamental approaches to policy are changing over time. Second, it may be unwise to cite low unemployment or faster growth alone as factors suggesting higher inflation in the future. Third, it may be more important in the current circumstances to take signals from actual inflation and inflation expectations as a guide to policy actions instead of relying more heavily on signals from the real economy.

I agree with the staff memo that should we cease to be an inflation-targeting central bank, then the risk that we could replay the 1970s could increase, but as long as we remain committed to inflation targeting, we may see only limited feedback from real variables to observed inflation, and, therefore, we should be careful in interpreting movement in real variables as harbingers of inflation to come.

I have a brief comment on the December rate increase probabilities and inflation. As was noted earlier at this meeting, the probability of a December rate move by this Committee has moved very close to 1. I find this somewhat disturbing. I see us as somewhat overcommitted to the December meeting, as we haven't seen the data in the run-up to that meeting. One risk of being overcommitted is that the data between today and the December meeting will disappoint, leaving the Committee in the awkward position of having to either raise the policy rate despite

unfavorable data or renege on what seemed like a Committee promise to follow through in December.

We have been in this situation each of the past three years. Previous years have been kind to the Committee, and we were able to go ahead with the rate moves as scheduled. This year it looks like inflation is unlikely to cooperate, so the Committee will be raising the policy rate in an environment in which we can claim little or no progress on moving inflation toward our 2 percent target. This may, in my view, depress inflation expectations further and possibly put downward pressure on actual inflation.

If we consider inflation compensation in the TIPS markets, the five-year breakeven is running at about 1¾ percent. These TIPS measures are based on CPI inflation. If we subtract 30 basis points to convert to PCE inflation, that leaves us with a reading of 1.45 percent—that is, private-sector market participants who are betting their own money expect less than 1.5 percent PCE inflation over the next five years. One could make other adjustments to these numbers. This 1½ percent for me is too low for comfort over that long of a time horizon. The FOMC should be able to control inflation over a five-year time frame.

A good question in my view for the Committee, and one I'll return to tomorrow, is, why are we overcommitted to December? In my opinion, there's a clear answer to this question: It's a flaw in the SEP, which we have discussed previously here at this table. The horizon of the SEP for the current year shortens as the year goes on. This means that, as of the September meeting when the Committee is asked how many rate rises they see for the rest of the year, they're basically predicting what's going to happen at the December meeting and essentially voting on—not directly, but by the dot chart—the December meeting at the September meeting. I think this is a flaw. We've talked about it before here. There is a cure for this, which is to keep the

horizon always at one year for each SEP round so that we're not getting boxed in at the end of the year, as we are again this year. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. Despite some disruption due to the hurricanes, the economy appears to be carrying significant momentum into the fourth quarter. The unemployment rate, which should not have been greatly affected by the hurricane, declined to 4.2 percent and is now well below the SEP's 4.6 percent median estimate of the natural rate of unemployment.

With real GDP expected to continue growing faster than potential GDP, the unemployment rate is likely to fall further below my current estimate of full employment. Recent declines in the unemployment rate are quite consistent with the Tealbook forecast that the unemployment rate will fall to 3.6 percent by 2019, a full percentage point below the SEP median and even further below the rate corresponding to the staff's estimate of full employment.

Such an outcome would likely be unsustainable, and it increases the risk of venturing into a region of the Phillips curve that entails sizable responses to very low unemployment. One reason the Committee might be willing to accept further tightening conditions in the labor market is the uncertainty surrounding estimates of the natural rate, which might encompass rates below 4 percent.

The U-3 unemployment rate, however, is not the only labor market indicator that shows a tight labor market. Other indicators also suggest that little slack remains. Initial claims for unemployment insurance are now at lows last seen in the 1970s. This is consistent with firms being reticent to fire workers, because of the difficulty of replacing them, or with workers who

do lose their job, quickly find new employment, and do not need to file claims for unemployment. Either interpretation is a sign of a tight labor market.

In addition, recent growth in unemployment has been accompanied by attracting workers from outside of the labor force. However, the flow of workers from outside the labor force to unemployment has dropped below pre-financial-crisis levels. This is consistent with either the pool of excess workers out of the labor force drying up or individuals outside the labor force moving directly into employment without spending time looking for work. Both explanations indicate that the labor market is now unusually tight.

Increasing nominal wage growth is another important indicator of labor market tightness. My staff estimated wage Phillips curves, both aggregate and disaggregated, down to individual state-level data. The results show that the relationship between nominal wage growth and unemployment has not broken down, although there is evidence that the size of the estimated coefficient on the unemployment rate has diminished. These results seem consistent with the gradual increase in ECI wages and salaries and average hourly earnings we have seen to date. The results are also consistent with more notable increases if the unemployment rate gets as low as predicted in the Tealbook.

While a tighter labor market and higher wages are likely to eventually show through to prices, both total and core inflation remain below our target. This has led to alternative hypotheses about why inflation is currently low. Suggestions include that it is perhaps because technological disruption or greater competition from abroad are increasing competitive pressures and holding down prices.

One way to see which sectors are being affected is to run sectoral Phillips curves to determine if the relationship between inflation and unemployment rates—in particular, CPI

sector categories—have changed. My staff examined a number of categories, with each category generally composing 2 to 8 percent of the CPI expenditure basket. They found that while the coefficient on the unemployment gap had fallen across most sectors, the effect was insignificant for most. But the effect was most significant for rent of primary residence, owners' equivalent rent, and food away from home.

The strength of the findings in these categories surprised me, as these are nontradable items that do not seem likely to be affected by recent technological changes or global competition. In addition, the staff work found less persistence in the sectoral inflation rates, so low readings are less likely to be followed by low inflation in the future.

Another way to connect building wage pressures to future inflation examines the role of markup pricing. My staff examined which industries were most likely to increase prices as wages rose. In particular, they explored if industries with increases in profit margins were more likely to absorb increased wages without passing these costs through to prices. While the work is preliminary, it found strong statistical correlations between lagged increases in margins and lower subsequent price increase. These results indicate that lack of competitive pressures, rather than more competitive pressures, are leading to delays in higher wages translating into higher prices.

These results seem consistent with some change in the effect of labor market slack on inflation, either a smaller slope or some delayed pass-through of pressures due to larger profit margins. Should labor markets tighten more, as expected in my forecast and that of the Tealbook, I would be concerned that some of the idiosyncratic negative shocks will drop out of the sample in the spring, and the tightness in labor markets will start showing through more clearly on prices. I will discuss the policy implications tomorrow. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Acting President Mullinix.

MR. MULLINIX. Thank you, Madam Chair. Real GDP growth this year has been strong relative to potential, and I expect this to continue in light of the information we received since our previous meeting. September reports on retail sales and durable goods shipments and orders are consistent with continued healthy growth in consumer spending and business equipment investment. The strength in consumption and equipment investment should be sufficient to keep overall economic activity moving forward at a healthy pace despite the recent weakness of investment in residential and nonresidential structures.

With real GDP running above potential, the labor market continues to tighten. A wide range of labor market indicators provides direct evidence on this tightening. The unemployment rate is already below estimates of its natural rate, and it continues to decline. The labor force participation rate is already above estimates of its long-run trend, and it continues to increase. The job openings rate is at a historically high level, and the quits rate is close to its previous cyclical peak.

Average nominal wage growth has not increased, but real wage growth in this cyclical expansion appears to be in line with its past behavior when conditioned not only on cyclical indicators, but also on labor productivity growth. Many observers have pointed to the role of productivity growth, and my staff is continuing to investigate this issue.

Core inflation has remained surprisingly low in light of the high level of resource utilization. I agree with the view many of you have expressed that temporary factors are holding down core inflation, and we are likely to see higher core inflation next year.

In this context, the stability of most measures of inflation compensation in recent months has been welcome. Information from the Fifth District is broadly consistent with the national

economy. We continue to see moderate growth in the manufacturing sector and a slightly stronger pace of activity in the services sector. Our contacts continue to complain about the difficulty of filling positions and how that limits their ability to take on new business.

Although the direct effect of the hurricanes on the Fifth District economy was limited, they have, nevertheless, introduced additional noise into the data flow. We received numerous accounts of difficulty finding trucks and truck drivers and have anticipated shortages of some building materials, much of it attributed to the reconstruction efforts in Texas and Florida. I believe some of the information we receive for the District will have to be viewed through this lens. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Bostic.

MR. BOSTIC. Thank you, Madam Chair. I'll begin my remarks with a very brief comment about the aftermath of the hurricanes. As President Rosengren noted, indications are that disruptions from the hurricanes and related flooding were mostly temporary, and activity resumed relatively quickly, with the notable exception of the agricultural sector.

The relatively fast bounceback may have been reflected in the faster-than-expected third-quarter GDP growth reported last week. On the other hand, maybe the storms really did take as much as 1 percentage point off growth in the short run, as estimates presented at the previous meeting suggested. In that case, the economy would seem to have shifted into a higher gear. That would make concerns about the stance of policy and potential overheating more present than I have been thinking.

In our on-the-ground discussions with contacts this intermeeting period, we made a concerted effort to ask questions that would help us draw a clearer picture of the underlying state of the economy. Across 60 face-to-face field interviews with contacts and businesses and

nonprofit organizations, 3 advisory panel meetings, and discussions with our 44 board members, we posed essentially the same question. With respect to the condition of labor markets in particular, which characterization feels closer to reality? (a) Labor resources, with the exception of a few particularly high-demand jobs, are relatively plentiful, and I am confident I can attract whatever workers I need without much need to raise wages; or (b) labor is getting difficult to come by, and I think we are very close to entering a phase of rapidly rising wage pressures.

The most common response: None of the above. [Laughter] Maybe that response is not surprising since we set up two polar straw man positions. But if I had to choose one word to describe the current attitudes of our contacts about current and expected conditions, that word would probably be “contentment.” Now, here I must confess that my staff spent some amount of time debating what the definition of “contentment” actually is. So I feel compelled to tell you the definition that I am using—namely, “satisfied with a certain level of achievement.”

Though there are the usual differences across sectors and in specific geographic areas, on balance we are hearing a remarkably similar story. First, margins and profitability are good. Second, slow and steady growth in business activity is expected to continue. Third, there is little to suggest price pressures moving in either the upward or downward direction. And, fourth, while reports of wage acceleration continue in the familiar job types—construction, nursing, IT, and compliance-related professions—overall labor costs are inching up only at best and do not appear to be a significant concern in the near term.

To be sure, the reports that labor markets are tightening persist. So we decided that we would push a little harder on the question many of us have been asking. If labor markets are tight, why aren't you raising wages? There were a lot of different answers to this question, but

we did detect types of answers that popped up with sufficient frequency to suggest some themes as to why wage growth is not accelerating.

Some of our directors and contacts noted the age composition effects that President Williams has talked about. Specifically, in some areas, the suppression of overall wages is coming from the replacement of older, more experienced, higher-wage workers that are transitioning out of the labor market and being replaced by younger, less experienced, and lower-wage workers.

Others indicated that, for the time being, nonpecuniary aspects of the employment proposition are often seen as substitutes for outright wage increases. That is, in some markets and for some types of jobs, workers seem willing to forgo some wage growth for flexibility in working arrangements, for job security, for desirable working conditions, and so on. This isn't new, but the employers we are talking to seem to believe the willingness to accept, if not demand, this sort of tradeoff is much more common than it may have been even a few years ago.

These two themes may be related, as reports of the desire to substitute job quality characteristics for wages are usually connected to younger workers. Indeed, more than a few of our contacts indicate that they are working to reconfigure business processes to accommodate the demands of a younger workforce that increasingly is focused on the nonwage aspects of jobs.

Finally, many of our contacts are responding to what they perceive as current or anticipated labor market tightness with their own efforts to expand the qualified supply of labor. This obviously includes investments and partnerships related to skills development. But when we pressed our contacts, we uncovered a relatively nuanced view of what is meant by “qualified.” Especially in the low- to middle-skilled segments of the labor market, the qualified

pool is characterized not by the usual hard and soft skill attributes, but rather by access to affordable housing near employment sites, access to transportation and childcare, and so on.

As an example of an investment to expand the qualified pool of workers and mute local labor market tightness, one of our directors, a large employer in the food manufacturing segment, reported running his own bus lines to address the lack of transportation that would otherwise preclude some of his workers from taking employment at his plants.

It's hard to know the degree to which this collection of forces can contain wage pressures and for how long. We do pick up pretty consistent reports that location-based wage pressures are increasingly noticeable and more widespread. Those areas in which unemployment rates are at or below historic norms are in fact experiencing rising labor costs, and the number of areas in which unemployment rates are at or below historic norms is growing. Still, I am not left with the impression that a significant general acceleration of wages is imminent if business activity continues at the pace businesses anticipate and are planning for. I do have the impression that, although some amount of slack may yet remain, the economy is near full employment.

My guess is that any significant expansion of activity would be a problem, both in terms of faster wage growth and a deterioration of labor quality, should businesses have to dig more rapidly and deeper into the pool of potential workers. But here's the thing: I don't get much, if any, signal that a generalized, significant expansion of business activity is in the offing. Our contacts do not expect it, nor do they expect that cost pressures are poised to shift to a higher gear.

What would it take to move the needle on the pace of economic activity and induce more aggressive wage programs to retain and attract labor? I can't say that I have a clear view into that, but I am struck by the fact that anecdotal reports of expansion plans are, on balance,

modest. Acquisitions and market share capture are still the go-to growth strategy for many of our contacts.

It's possible that tax reform, should we see it, could be one of the needle movers on economic activity. We haven't yet fully explored with our contact network what kind of package might change their thinking about investment and business expansion. But most do seem to think that the right configuration of fiscal policy choices could result in a significant ramping-up of growth, at least in the near term.

In short, all of this anecdotal information just convinces me that the data are not lying to us. A reasonable forecast for the foreseeable future is more of the same—real GDP growth continuing a bit in excess of 2 percent, the unemployment rate hovering around the low 4s, and modest increases in real wage growth.

A discernible move in inflation toward our objective remains an unfinished project. For now, I'm sticking with the assumption that the dissipation of transitory influences will do the trick of moving us up to 2 percent without a significant amount of overshooting. But I have to say, that's an article of faith, and I continue to scratch my head on the question of what we should do if inflation continues to hover somewhere south of 2 percent. I will return to this issue in the policy round tomorrow. Thank you.

CHAIR YELLEN. President Williams.

MR. WILLIAMS. Thank you, Madam Chair. Beth Anne Wilson linked a lot of her comments today to Halloween. I'm going to start my comments by making reference to another event that's happening this week that no one's talking about, but I know everyone here is focused on, and that is, of course, the World Series. [Laughter]

It's my usual role here to speak about what effect the event of the World Series has on the U.S. economy, and, as President Evans likes to point out, he suggested I sometimes cherry-pick my data [laughter] to report the positive effect of the wins of the San Francisco Giants or the Golden State Warriors on the economy. But this time I'm going to be very fair about this, and I am going to once again analyze the data that relate the relationship between who wins the World Series and how the economy performs the next year.

Now, this year the World Series obviously is between the Houston Astros and the Los Angeles Dodgers. I run into the same problem I had when I looked at the Giants versus the Texas Rangers. I have a dearth of data on Astros World Series victories [laughter], so, therefore, I will—

MR. KAPLAN. You might get a data point soon.

MR. WILLIAMS. Let me get to that. I do, however, have quite a bit of data on the Los Angeles Dodgers, because, between their history in Brooklyn and Los Angeles, they are among the teams that have many World Series appearances and victories.

I looked carefully at the data since 1929 when the Dodgers were in the World Series, and when you look at the years that they won the World Series, real GDP growth actually was unfortunately below average in the year after. And so I really think that the data speak to this issue. But what's even more telling is that the years that the Los Angeles Dodgers lose the World Series, GDP growth has averaged 5.5 percent in the next year. So on the basis of this careful analysis, I must, even as a representative of the Twelfth District, say that I think, for the good of the economy, I cannot support the Dodgers in the postseason. [Laughter]

Now, I did ask Ben Bernanke when he was Chairman about whether I was required in my role to support the Dodgers if they were in the World Series, and he pointed out to me that the

founders of the Federal Reserve foresaw this very circumstance and, in their wisdom, had created the Branch system. Then-Chairman Bernanke told me that I could fairly allow the Los Angeles Branch to fly the Dodgers flag on their facility in support of their team and that I was not required, as the President of the Federal Reserve Bank of San Francisco, to do so in San Francisco. I will report that, as typical Los Angeles Dodgers fans, as of yesterday, they still hadn't gotten around to hanging the L.A. Dodgers flag. [Laughter] Anyway, so that's my view on the World Series and what it means for the U.S. economy.

Now, regarding more serious matters at home, the Twelfth District is the latest to suffer from a natural disaster. I'll report briefly on the fires in Napa and Sonoma Counties, which you've heard about. They are the most devastating in California's history. We've had a lot of wildfires in our past, obviously in Southern California and Northern California, but this is actually the worst in terms of loss of life and property, and, of course, thousands of people have been displaced.

In the bigger picture, however, the overall economic effect is likely to be limited. The affected areas were not major population or business centers, and most property damage is insured. The famous vineyards and related tourism facilities are largely intact, and many are already returning to business. In fact, their biggest complaint is that the news stories have stopped talking about that part of the story, and they want to get the tourists to come back up to Napa and Sonoma. In terms of the destruction of homes, of course, we're in one of the tightest residential markets in the country, and that creates a very difficult position for the displaced families that have been affected by this and also will put further upward pressure on house prices and construction costs.

Regarding the national economy, the data on economic activity since our previous meeting have equaled or beat expectations. Indeed, I see upside risk to my forecast of GDP growth of 2½ percent for the year as a whole in light of soaring consumer confidence, solid gains in consumer and business spending, ongoing strength in the labor market, and the likelihood of a Dodgers defeat tonight. This pace of growth is substantially above the economy's potential. The overall positive outlook for the economy is also reflected in the optimism of my contacts. They see few, if any, signs of a slowdown. I think this is consistent with the other comments we've been hearing, even in those areas that have been quite hot in the past.

In the labor market, although the hurricanes took a toll on the September job numbers, there's little doubt that the labor market continues to tighten. Data given in the household employment survey, which are generally unaffected by Harvey and Irma, showed robust job gains, resulting in a decline in unemployment and an increase in labor force participation. And recent employment cost index and average hourly earnings data have also been encouraging. Looking ahead, I expect payroll job growth to bounce back and the strong momentum in the labor market to continue, resulting in further declines in the unemployment rate. In my forecast, unemployment drops below 4 percent early next year, and it remains there until early 2019.

And in light of the ongoing strength in the labor market, the failure of core inflation to move more quickly toward our longer-run target has caused some anxiety and once again raised rumors of the death of the Phillips curve. But, much like the death of Mark Twain, I believe these rumors are greatly exaggerated.

So as I noted at our previous meeting, much of the puzzle of low inflation can be explained by recent declines in prices that are generally unrelated to economic slack. Those would include the big drops in pharmaceuticals, air fares, cellular communications, and other

services, along with the more persistent effects stemming from legislative cuts in mandated health-care payments.

If you listen very carefully, the Phillips curve is showing a heartbeat. The cyclically sensitive categories of core inflation have behaved largely in accordance with the reduction in labor market slack we've seen in the past year. Now, this conclusion is consistent with reports from my contacts, along similar lines to what others have said. A number of them tell me that labor markets have tightened, and they needed to boost compensation one way or another to avoid turnover. They've also noted that that doesn't always go into wages. Many workers are willing to forgo wage gains for continued employer coverage for health-care costs. But either way, these are feeding into increasing compensation costs as labor markets continue to tighten.

Of course, the underlying Phillips-curve mechanism can be challenging to uncover in standard reduced-form statistical analysis that we talk about here a lot. The interactions between unemployment and inflation depend crucially on the reasons why unemployment's low or high and, of course, are subject to substantial lags. Another time when the Phillips curve was supposedly at death's door was back in the late 1990s, when rapid productivity growth drove both inflation and unemployment down.

To overcome these challenges, my staff took a fresh look at the co-movement between inflation and unemployment following unanticipated shifts in aggregate demand. This approach tries to isolate the effects of demand shocks, or a strong economy, for which the Phillips curve is really designed, from those to supply, such as changes of productivity.

They identified these demand shifts using standard Romer and Romer monetary policy shocks as well as shocks to government spending. Their analysis finds that shocks to aggregate demand have the expected effect on unemployment and inflation, with the two moving in the

opposite directions, as predicted. They also find that the responses of inflation tend to be stronger when unemployment is very low relative to the natural rate. But the catch is that the timing of these effects can be quite different.

The peak response of inflation lags that of unemployment by about a year. Notably, these findings are broadly consistent with the observations of unemployment and core inflation, absent the one-off factors I discussed over the past year. Recall that the unemployment rate didn't start to consistently run below 4.8 percent—that's my own view of the natural rate—until early this year. So one should not be expecting a significant pickup in inflation already from tight labor markets.

Patience is a virtue, and that also applies when looking for the effects of labor market tightness on inflation. Applying this historical experience to the current situation, I expect that, with a persistent and significant demand-driven undershoot of unemployment in train, inflation will gradually rise to our 2 percent longer-run goal over the next few years. Thank you.

CHAIR YELLEN. Thank you. Well, I suggest at this point we take a 20-minute break, but before we do so, let me remind you that the Board's photographer will be appearing after we return and taking pictures, and it would be good if, during the break, you would cover over materials. Also, if there is a mess in front of your place, tidying up a bit [laughter] would be probably appreciated by posterity or the photographer. So let's take a 20-minute break.

[Coffee break]

CHAIR YELLEN. Okay. Let's resume. President Mester.

MS. MESTER. Thank you, Madam Chair. Data and reports from business contacts indicate that business activity in the Fourth District has improved over the intermeeting period, consistent with continued moderate expansion.

The October reading of the Cleveland Federal Reserve staff diffusion index measuring the percentage of business contacts reporting better versus worse conditions increased to 37 from 27 at the previous meeting. It's now back to the level seen in the spring and is among the strongest readings since 2014. The strength is broad based across sectors save for the auto industry, which is reducing production. Some of that reduction relates to retooling for new models. Some relates to slow sales of particular models. Consistent with generally increasing activity, respondents reported a notable increase in planned capital spending, back to levels last seen in mid-2015.

District labor market conditions remain strong. Year-over-year growth in payrolls has averaged 1 percent over the past three months, which is above trend for the District. And the unemployment rate has averaged about 5¼ percent. Contacts continue to report they're having difficulty in attracting and retaining workers, and that wages are moving up across a variety of occupations and skill levels. For example, one firm has instituted what they call "longevity bonuses" in an attempt to keep warehouse employees with the company, and the staff in companies that specialize in placing lower-skill workers have begun relaxing some screening criteria, including convictions for some felonies. Skilled construction workers remain in short supply, and one business contact implemented salary increases and bonuses at midyear for the first time to reduce turnover.

I've been reporting for some time that price pressures in the District have been modest, but incoming information suggests that may be changing. The Federal Reserve Bank of Cleveland staff's diffusion index of output prices moved up notably in October, and average index readings have been trending up from about 10 in 2015 to 13 in 2016 and to 23 in 2017.

Also, more firms are reporting they've had no problem passing on price increases to their customers.

Regarding the national economy, reading through the effects of the hurricanes, my view of the economy and the outlook is little changed from our previous meeting, and I continue to see positive underlying fundamentals and momentum. According to the first estimate, real GDP growth in the third quarter was 3 percent, nearly the same as in the second quarter. Hurricane effects were likely modest. Consumer spending and business spending on equipment showed solid growth. I expect above-trend growth over the remainder of this year and over the next couple of years.

The monthly indicators we have so far for September and October are consistent with growth above trend. Business and consumer sentiment remain near expansion highs, as do the ISM indexes for manufacturing and nonmanufacturing. The new orders indexes in the ISM and across regional Federal Reserve surveys point to continued strength in manufacturing.

The hurricanes led to a decline in payroll employment in September, but that will be temporary, and overall labor market conditions remain strong. Excluding the hurricanes, payroll growth is above trend, and the unemployment rate, at 4.2 percent, is at its lowest level since 2001 and well below estimates of its longer-run level. Broad measures of unemployment had also declined, and the labor force participation rate has risen further above its downward trend, all consistent with tightening labor markets. I expect this tightening to persist and the unemployment rate to remain below its longer-run level for the next several years.

While average hourly earnings picked up in September, the reading was likely affected by the hurricanes, with many lower-wage workers and sectors disproportionately affected by weather, like leisure and hospitality, not included in the samples for the month. The ECI data

control for employment changes among occupations and industrial sectors and so should be less affected by weather. The third-quarter data show that the acceleration in this measure of compensation that we've seen since 2013 continues. There's been a rising number of anecdotal reports of wage increases, and the NFIB survey indicates that firms have been raising wages and expect to continue to do so. It remains to be seen whether these reports will translate into further acceleration in the aggregate compensation measures. Unless the pace of productivity growth picks up, I wouldn't expect to see a strong acceleration in real wages.

Inflation remains stable but below our target of 2 percent. The recent readings have been subdued because of a variety of factors. Now, one reason to be concerned about low inflation readings would be if they're signaling a persistent dropoff in demand. But labor market conditions are and are expected to remain strong, and economic output is growing above trend and is expected to continue to do so. So the low inflation readings are not signaling a falloff in demand.

Another reason to be concerned about running below our inflation target for so long is that it has the potential to undermine inflation expectations. So far, inflation expectations have remained stable and near 2 percent despite the underrun. The latest readings on longer-run inflation expectations given by the Blue Chip consensus, Consensus Economics, and Survey of Professional Forecasters have remained stable at levels consistent with our 2 percent objective.

Other measures of expectations have also been broadly stable. Both the Federal Reserve Bank of Cleveland's model-based 5-year, 5-year-forward measure and the Federal Reserve Bank of New York's median 3-year-ahead measure of inflation expectations edged up since the previous FOMC meeting. The University of Michigan's 5-to-10-year-ahead median measure has remained within the narrow range that has prevailed for the past couple of years.

The stability of inflation expectations remains key to the inflation outlook, so we need to keep careful watch on expectations. But because inflation expectations remain stable, despite some low inflation readings, I don't assess the evidence that we've accumulated thus far as enough to change my view that inflation will gradually return to our 2 percent goal with some inevitable detours as idiosyncratic price shocks in various sectors work their way through the inflation measures.

Jon Faust's and Jonathan Wright's comprehensive review of inflation forecasting models and methods in the *Handbook of Economic Forecasting* indicates a subjective forecast of inflation, like those in the Blue Chip survey, the Survey of Professional Forecasters, and the Board's staff, beats statistical and structural model-based forecasts like VARs, the Phillips curve, and DSGE models. They also find that a simple forecast that inflation will gradually move from its current-quarter estimate to its long-run survey forecast is a very good forecast. Those long-run survey readings have been quite stable at 2 percent. Hence, I do think it's reasonable to project that inflation will gradually return to our goal over the next couple of years. That said, I acknowledge and find it dissatisfying that we can't forecast inflation with much precision, and I'm looking forward to the special topic discussion of inflation planned for the January meeting. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Madam Chair. Let me start with a word on the aftermath of Hurricane Harvey. Federal Reserve Bank of Dallas economists now believe the property damage from Hurricane Harvey will be somewhat below the initial estimates of \$75 to \$100 billion. We now expect damage somewhere in the range of \$70 to \$80 billion. The biggest change is that home damage now is expected to be materially lower than originally expected, at about \$35 billion. Interestingly, auto damage is a little higher than initially expected, \$11 to

\$12 billion, and I think you can see this reflected in higher automotive sales in the United States in the aftermath of the storm. But, on the basis of our discussions with contacts, we continue to believe that a substantial portion of the damages will prove to be uninsured.

We also expect that the temporary job losses, which we initially estimated between 55,000 and 75,000 jobs, will likely be somewhat lower than expected. And this appears to be because employers have been more reluctant than we would have expected to lay off workers because they were concerned that they wouldn't be able to hire them back after the layoff, on account of the tight labor markets.

We continue to expect job growth for the state to be approximately 2.6 percent in 2017, which is basically the same job growth forecast we had pre-storm. This is the highest level of job growth in three years and in line, as I mentioned, with estimates pre-hurricane. These growth numbers reflect third-quarter weakness and a fourth-quarter rebound—a pattern consistent with our expectations regarding the U.S. economy.

It's worth mentioning, to contrast with other storms at other times in our history, Texas continues to benefit from migration of people and firms to the state. We found, historically, that if a severe storm hits and the basic trend is upward, the storm normally does not disrupt that trend. If the basic trend before the storm is flat to downward, though, it may accelerate that downward trend, as we're seeing elsewhere. For Texas, the trend was upward. The population of the state was roughly 22½ million people 10 years ago. It is now pushing up in excess of 28 million people. These migration trends continue to provide a strong tailwind, which helped the state not only weather the energy downturn, but should help Houston and the Gulf region manage through the aftermath of Hurricane Harvey.

These migration trends, though, have particularly helped the larger cities in Texas—Dallas, Houston, Austin, and San Antonio. And I would contrast that—even with this migration trend—smaller towns like Lubbock, Wichita Falls, and even, to some extent, El Paso are complaining about a trend of the younger people leaving to go to bigger cities in the state or elsewhere in the nation because of better career and compensation opportunities as well as for cultural reasons. A lot of the complaints we hear regarding labor shortages in our District, skilled and unskilled, are particularly acute in the smaller or rural communities. I think this is a trend we're going to see continue.

Regarding energy, the Gulf Coast is home to a substantial concentration, as we all know, of refinery capacity and offshore production facilities. As we've mentioned before, hurricane-related refinery outages temporarily affected oil inventories and, as we know, gasoline prices. My bank's economists estimate that the refinery industry came substantially back online by late September. More recently, though, Hurricane Nate did affect Gulf of Mexico oil production and operation of at least two refineries. I believe even those effects were modest and temporary. Our contacts in the refinery industry suggest that storm-related increases in gas prices should continue to wane, and they're still expecting gas prices to return to pre-storm levels over the next several weeks.

As we've also previously discussed, oil production was not materially affected by the storm. And our bank's recent Energy Survey suggests that drilling activity in the United States has moderated. One reason is because of lower oil prices, but the other reason is the trend toward energy investors wanting to see better returns on equity and cash flows from production companies. Put another way, they want to see more “disciplined growth and scrutiny of cap-ex.” This is creating some downward pressure also on cap-ex, in our view.

We continue to believe, though, that we're in a fragile equilibrium with global oil supply and demand in rough balance, reflecting the agreement by OPEC and other producing nations to cut production approximately 1.8 million barrels a day. It's still our baseline view that during the remainder of 2017 and into 2018, prices will likely range in the band between the mid-40s and the mid-50s, with prices at the high end of the range encouraging increased drilling activity and prices at the low end of the range discouraging drilling activity, as we've seen recently.

Regarding the United States, our bank's economists are now forecasting approximately 2½ percent GDP growth for 2017. This forecast reflects a strong U.S. consumer plus some improvement in nonresidential fixed investment. We continue to believe that this level of growth will be sufficient to remove slack from the labor market.

In this forecast, we also expect cyclical inflation pressures to continue to build. Discussions with our business contacts and the analysis of various industries, though, continue to suggest that pricing power of businesses is highly challenged across a broad range of industries. I would note that the 12-month Dallas trimmed mean has edged down from about 1.9 percent at the start of the year to approximately 1.6 percent in September—not surprising—but we'd also note that the 3-to-6-month averages appear to be firming. I do agree with some of the comments that some of this weakness is transitory—wireless telephone services, prescription drugs, and so on—but some of it, in our view, is likely not transitory, as you've heard before, through the effects of globalization and technology-enabled disruption.

I would note that the businesses we speak with in our District comment about the lack of pricing power, and the way they're adapting to it is to continue to look for opportunities to replace people with technology. And when they do replace people, they start with older workers, particularly doing buyouts of older workers—consistent with compositional effects that some of

you have talked about. Many of our contacts comment that their workforce, on average, is getting younger.

More significantly, our contacts also talk about their continuing efforts to build scale through merger activity. A substantial percentage of announced mergers and acquisitions—and this is not just true in the United States but, to my eye, globally—are due to disruption and fear of more disruption, and the degree of merger activity as a result of this, in my view, is unprecedented, at least in my career. Extremely low interest rates have helped facilitate record levels of merger activity and have allowed companies to borrow inexpensively to do mergers and finance share repurchases in order to create earnings per share appreciation.

Last comment: Our working hypothesis at the Federal Reserve Bank of Dallas regarding the effect of this disruption on the workforce is that if you're a college-educated person, you are probably well equipped to adapt to disruption. If you have a high school education or less, it is highly likely you'll experience your job being restructured or eliminated during your career, if you haven't already, and you're going to need to be retrained at least once in order to remain productive. We think this is a very challenging phenomenon. We think we are well behind, in the United States and most cities, in gearing up to provide this level of skills training, and we think this may be part of the puzzle that helps explain why productivity workforce-wide has been surprisingly muted. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Brainard.

MS. BRAINARD. Thank you. It's heartening to see the continued solid underlying momentum in domestic demand supported by the first synchronous global growth we've seen in many years. I'm especially encouraged to see labor force participation among prime-age Americans gradually moving back up to pre-crisis levels. However, there's a tension between

the signals we're getting from the labor market, which is in the neighborhood of full employment, and inflation, which has been below target for five years and has moved down rather than up this year. This poses somewhat of a conundrum for policy, which I see as the primary challenge we currently face.

Adjusted for inflation, GDP rose at a solid 3 percent annual pace in the third quarter despite the devastation wrought by the hurricanes. Business investment is up over last year, and consumers remain upbeat. Net exports and inventories also made a sizable contribution. This comes on top of 3 percent growth in the second quarter, and indications suggest we can expect a 3 percent economy in the fourth quarter, too.

Although the September reading on payrolls was likely distorted by the hurricanes, there's good reason to expect a bounceback over the next couple of months such that payroll gains continue at the pace seen earlier in the year. By the November report that we will receive before our December meeting, we should have a clean read.

The September household survey, which was likely not affected by the hurricanes, showed the unemployment rate moving down to 4.2 percent, slightly below the narrow range it had occupied from April to August and about $\frac{3}{4}$ percentage point below its year-earlier level.

Looking toward next year, the Tealbook baseline incorporates a tax cut worth about $\frac{1}{2}$ percent of GDP through the medium term. That's broadly consistent with the magnitude that we saw in the recently passed congressional budget resolutions. That seems like a reasonable placeholder for now, although it will be important to have information on the composition and timing, and we should learn more by the next meeting.

Financial conditions remain accommodative. Since the previous meeting, equity valuations have risen further, and corporate bond spreads have fallen further, especially for high-

yield bonds. Offsetting this, the dollar strengthened about 3 percentage points in trade-weighted terms, reflecting recent communications by the ECB. That appreciation of the dollar, together with a very modest rise in the 10-year Treasury yield, roughly offsets the effects on economic activity of the other changes in financial conditions. With Japan and the euro area having signaled their determination to stretch asset purchases and maintain highly accommodative monetary policies, and with a tightening cycle well under way here, there's good reason to expect further appreciation of the dollar over the medium term.

Of course, dollar appreciation is likely to exert a further drag on inflation, and, as we saw in the data “print” yesterday, inflation continues to come in surprisingly below what we anticipated earlier in the year. In the September data released yesterday, core PCE prices were up only 1.3 percent over the past 12 months, down $\frac{1}{2}$ percentage point from the previous year.

Even controlling for idiosyncratic factors in a variety of ways, the same puzzling decline is evident. For instance, looking at the annualized inflation rate subsequent to the sharp one-time decline in March, core PCE prices have increased at only a 1.5 percent annual rate. And, as President Kaplan pointed out, even the Federal Reserve Bank of Dallas trimmed mean, which tends to run a bit higher than core PCE, was only 1.6 percent over the 12 months through September, also down from the previous 12-month period.

Even for wages, there's little sign of an increase in pass-through from diminishing slack. There's only modest evidence that the acceleration in wage gains we had seen the previous year is resuming. This morning we received the September ECI, which posted a 12-month gain of $2\frac{1}{2}$ percent, only two-tenths above the preceding 12 months. Similarly, average hourly earnings over the 12 months through September rose only two-tenths higher than the pace a year earlier.

While welcome, these wage gains are modest and not yet reflected in other measures such as the productivity and cost measure of compensation per hour in the Atlanta Fed's wage tracker. The divergence between a labor market in the vicinity of full employment and the inflation that's persistently below our objective creates a conundrum for monetary policy. We are essentially balancing competing risks: failing to meet our inflation objective and thereby allowing inflation expectations to drift down on the one hand, and driving the unemployment rate still lower on the other. So let me briefly review these.

Historically, one of the key risks associated with low unemployment has been high inflation. Today, of course, we're confronting the opposite challenge. Nonetheless, if there were some sort of nonlinearity in the relationship between unemployment and inflation, the solution is clear. We have ample room to raise interest rates at a less gradual pace than currently foreseen in the SEP.

Another risk of very low unemployment, especially when accompanied by low interest rates, is that of financial instability. As we discussed earlier, although there's reason to worry about stretched valuations, the greater resilience and better risk management of the supervised institutions at the core of the system provide some reassurance on stability implications. And, as the Committee discussed in the spring of last year, we have macroprudential tools that we would rely on as the first line of defense, in view of the considerable tradeoffs and shortcomings associated with monetary policy as a bubble-fighting tool.

While very low unemployment rates clearly entail risks, so too does allowing expectations of low inflation to become entrenched in a low-neutral-rate world. Looking around the world, notably at Japan and the euro area, it isn't difficult to imagine a scenario in which the 1½ percent average inflation rate that we have seen over the past five years becomes embedded

in longer-run inflation expectations, and that, during the next economic downturn, the experience of inflation below that new lower trend risks another step-down in longer-run expectations.

Our tools for combating this second set of risks are quite limited. I look forward to discussing these risk-management considerations in our deliberations tomorrow. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Evans.

MR. EVANS. Thank you, Madam Chair. The comments given by my directors and other contacts this round point to a healthy real economy with no pickup in inflationary pressures. Heavy equipment manufacturers reported higher demand consistent with the stronger capital spending we see in the national data, and Ford and GM were encouraged by September's big increase in auto sales. Unlike the Tealbook, they thought only a small part of the surge was hurricane-related replacement demand. Instead, they thought much of the strength was makeup after unusual weakness in August. Ford expects the boost due to replacement demand to come in the fourth quarter, pushing light vehicle sales up to nearly a 17½ million unit pace. After that, they expect sales to settle out at around a 16¾ million unit trend.

In other information about hurricane recovery, my director at Discover Financial said Puerto Rico is still reeling, but that they've seen credit card usage in Texas and Florida return to normal.

Regarding labor markets, I heard a few more reports this round about higher wages, including increased pay for entry-level workers and those nearby on the job ladder. But overall wage growth remains modest. I didn't hear anything of note from my contacts with regard to price inflation.

For the national outlook, the real economy is on a solid footing, and we expect this momentum to carry forward into 2018. Our near-term growth outlook is similar to the Tealbook update.

With regard to inflation, the data continue to be disappointing. With each new low reading, it gets harder and harder for me to feel comfortable with the idea that the step-down in inflation earlier in the year was simply transitory. My chief concern is that inflation expectations have slipped well below 2 percent. Indeed, for some time now such slippage has been found in the Tealbook's estimate for the underlying inflation trend, and, as I interpret David Lebow's comment to President Kashkari, it has been that way for about three years—that they had reduced that underlying trend, and then they are forecasting next year for it to start picking up. So this crucial driver of wage and price behavior in the staff's inflation model is telling us that monetary policy still has stiff headwinds to overcome. I should note that I don't find it very useful to discern inflation expectations on the basis of long-run PCE inflation projections made by professional forecasters. They seem to have an unbending faith in our ability to achieve our inflation target.

Most other measures of long-run expectations have come down somewhat over the past several years. The intermeeting data have further reinforced our view that underlying inflation is mired below 2 percent. So we again lowered our core inflation projection by one-tenth for both this year and next year. We now have it at 1.4 percent in 2017 and 1.6 percent in 2018.

My projection is based on the assumption that the next increase in the funds rate will be delayed until mid-2018 in order to assess inflation developments. So this is a somewhat more accommodative policy than in the median SEP and a much lower rate path than in the Tealbook.

My view is that such accommodation is necessary to convince the public that the FOMC is serious about our symmetric inflation target. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Quarles.

MR. QUARLES. Thank you, Madam Chair. I have brief observations in three areas. One, the economy continues to perform well. Growth is expected to average 3 percent in the second half. That's the fastest two-quarter pace in a number of years. The noise surrounding the hurricanes has not obscured the fundamental strength in the labor markets. Unemployment has fallen to 4.2 percent. That's as low as it has been in closing in on two decades and materially below most estimates of the natural rate.

Second—and I agree with Governor Brainard, and I think, it sounds like, everyone around the table, that this is the fundamental challenge: Inflation remains low against the backdrop of all of this. I believe that it would be premature to give up on the idea that tightness in labor markets will eventually show up in prices. I tend to agree with the view that the low level of inflation mostly reflects idiosyncratic transitory factors. I was very interested as well in President Williams's quantification of the long and variable lag between unemployment and inflation, which would suggest that perhaps, far from being a mystery, it is, in fact, exactly what we should expect, that we would not have seen repercussions of the unemployment figures show up in inflation yet.

So I would expect inflation to move back to 2 percent over the next year or so. That said, with respect to the 2 percent target, I think we also have to realize that inflation is volatile, somewhat erratic. It can bounce around in a manner somewhat analogous to when I was a teenager learning to fly a plane on instruments. The first thing you were told is, "Don't chase the

needles.” The instruments will move slightly back and forth away from your course, and if you chase the needles, you will end up on the side of a mountain.

And, third, I think we have to be wary of the potential costs of pushing so hard in our desire to hit a target of 2 percent when it does not seem as if the traditional relationships are holding, at least in the current environment, in order to achieve a policy goal that may be statistically indistinguishable from a couple of tenths below 2 percent. In the words of either William James or Mr. Spock, “A difference that makes no difference is no difference.”

CHAIR YELLEN. President Harker.

MR. HARKER. I’m still trying to process that. [Laughter] Thank you, Madam Chair. Over the intermeeting period, the Third District continued to grow at a modest pace, with a notable acceleration in employment growth, some evidence of increasing price pressures in our manufacturing sector, and an outsized increase in nonresidential construction activity. Retail sales, surprisingly, have also picked up in September, but residential real estate shows little signs of life. Employment growth came in 1.9 percent over the three months to September, and the region finds itself in the unusual position of outperforming the nation. That’s coupled with the unusual position of the Philadelphia Eagles being the best in the NFC. [Laughter]

Thus, labor markets are providing a valuable impetus to my District’s overall economic health. Growth is especially robust in leisure and hospitality, mining and construction, and education and health services. However, the unemployment rate remains stable at 4.8 percent, which could indicate that, while healthy, our labor market may still have some “room to run.”

September’s construction contracts increased more than 14 standard deviations. Let me say that again: more than 14 standard deviations. Now, this increase was solely due to a huge

ethylene cracker plant under construction in western Pennsylvania. The scope of the project dwarfs what will be Amazon's HQ2.

The residential real estate market remains lackluster, with housing permits being relatively flat over the past two years. Additionally, with the exception of Philadelphia, regional house price growth is only roughly half that of the nation.

Our outlook for manufacturing remains one of steady, consistent growth. Our October manufacturing index continues to remain above its nonrecessionary average, and shipments and new orders remain elevated. Further, the employment index reached a new record high. We also received a number of reports from manufacturers and homebuilders of hurricane-related scarcities for some inputs as well as significant delivery delays. However, manufacturers continue to remain bullish, with the Future Capital Expenditures index remaining quite elevated. Furthermore, there are signs of price pressures, as there were significant increases in the Prices Paid Index, and firms appear to be anticipating higher prices in the future.

Our service sector appears to be growing modestly, with September's good weather spurring a pickup in sales at convenience stores. Consumers, like firms, continue to be optimistic.

Now, regarding the national economy, my forecast of the economy is not very different from that of the staff, with the exception that I do not see the unemployment rate drifting quite so low. I also anticipate some strengthening in inflation, but, like others, I get increasingly concerned with each passing data point. And, as I mentioned at our previous meeting, a low r^* environment may have consequences for our ability to hit our target on a continuing basis. I will return to that observation tomorrow in my comments. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President George.

MS. GEORGE. Thank you, Madam Chair. Overall economic activity in the Tenth District continues to increase, with monthly surveys showing that District factory and services activity expanded since the previous meeting. Job growth has been positive, but with the District unemployment rate at 3.6 percent, tight labor markets appear to be holding back faster growth. This judgment is based on reports received from our business contacts. Nominal wage growth in the District has quickly returned to the national average over the past year after being more than 1 full percentage point lower than the nation in 2015 and early 2016 because of subdued activity in the energy, manufacturing, and agriculture sectors in those years.

Contacts are currently reporting wage pressures in hiring and retaining workers. Some report implementing labor-saving technologies due to difficulties in finding qualified workers and to address quality control and safety concerns. However, many of our contacts reported either lowering the educational requirements to find workers or providing more in-house training.

Energy and agriculture continue to heavily influence the District's economic performance. In the energy sector, drilling activity is holding steady as producers settle into range-bound WTI prices between the high 40s and low 50s per barrel. And the District's ag economy remains under pressure, with declines in both crop and livestock prices. To date, farmland values have remained relatively high, giving borrowers and lenders space to extend operating lines as cash flow stresses mount.

With regard to the national economy, my outlook is little changed since our previous meeting. Third-quarter estimates of GDP point to a resilient economy in the face of several severe storms and bolster my confidence in a forecast of above-trend growth for this year. I continue to expect output growth to moderate next year toward its trend level, with a slight

decline in the unemployment rate and with inflation moving higher. Although hurricane-related disruptions significantly lowered payroll growth in the third quarter, I expect we'll see a rebound in the coming months. And over the next few years I continue to anticipate a gradual slowing of total job gains in line with more moderate output growth.

With the unemployment rate at 4.2 percent, its lowest rate since February 2001, I see little evidence of slack remaining in the labor market even in the face of modest real wage growth. In the current low-unemployment environment, real wage growth, once adjusted for productivity growth, looks quite similar, if not a bit higher, than wage growth in the late 1990s.

Over the past five years, the growth in real wages, as measured by real compensation per hour, averaged around 1 percent. This growth is a bit faster than the observed annual labor productivity growth of 0.7 percent during this time. In comparison with the low unemployment period of the '90s, growth in real wages averaged 2.3 percent between 1995 and 2000, which was less than annual productivity growth of 2.7 percent for that period. Comparing these two times, real wage growth, once adjusted for productivity, looks to be in line with—and even a bit faster than—real wage growth in the previous period, suggesting that labor market conditions are reflective of a tight labor market with limited remaining slack.

In addition to real wage growth and job gains, financing conditions remain generally supportive of consumption spending in coming quarters, with moderate consumer credit growth for households other than the subprime borrowers who face tighter lending conditions. At the same time, however, I remain uneasy about the current accommodative stance of financial conditions more generally. As the Tealbook notes, a range of indexes will continue to characterize financial conditions as more accommodative than average and, in particular, as

looser than in late 2015. As others have noted, equity prices have continued to rise and are flashing red, as highlighted in the staff's QS report, while the VIX remains near historical lows.

Finally, softness in core inflation this year has been persistent and fairly broad based, and I do not expect a notable increase in inflation in the next few months. Even so, the economy's solid fundamentals suggest inflation is likely to move higher over the medium term. With the unemployment rate now at 4.2 percent, labor market conditions continue to tighten, and inflation expectations have remained stable.

My staff's estimate of the inflation trend also has remained stable over the past several years and ticked up recently, as did the Federal Reserve Bank of New York's underlying inflation gauge. Signals given by these indicators, along with the strength and broader fundamental factors that shape underlying inflationary pressures, including the modest improvements in international growth, suggest inflation is likely to move higher over the next year.

With the economy growing faster than trend, labor markets tightening beyond full employment, and inflation low and stable, economic conditions appear favorable and broadly consistent with our mandate. To sustain this performance, our policy stance will need to continue its gradual shift from accommodative to neutral, a path that is consistent with considering another rate increase in December. Thank you.

CHAIR YELLEN. Governor Powell.

MR. POWELL. Thank you, Madam Chair. As we look through the effects of the recent hurricanes, the incoming data show an economy that is expanding at a moderate but above-trend pace. The labor market shows continued strength. Despite strong growth and tightening labor market conditions, recent wage and price data have been mixed, with a firming in some wage

measures but continued weak readings on core inflation. My overall outlook for the economy remains a healthy one, but with continuing risks that inflation may remain stubbornly below target.

Growth is at 3 percent in the second half of the year and on track to come in at 2½ percent for 2017. PDPF, which is a good gauge of momentum, slowed in the third quarter, perhaps because of the hurricanes, but nonetheless remains above trend at just over 2 percent as a result of continued strong business investment.

The global environment of synchronized growth has probably supported investment demand and held the dollar in check this year. The durability of the surge in investment may also be linked, to some extent, to the prospects for tax legislation. The scope, scale, and composition of any such legislation remain uncertain. But the likelihood that there will now be significant legislation has clearly risen, and the parameters should become clearer—as Governor Brainard said, I believe—by the time of the December meeting.

Turning quickly to the labor market, payroll employment growth averaged 180,000 jobs per month for the first half of the year and, with the slow September, dropped to 91,000. If the staff's estimate of the 200,000 negative effect in September is about right, then the underlying pace for the third quarter is around 160,000, still well above the pace of labor force growth. At the December meeting, of course, we will have employment data for October and November, which will shed light on hurricane effects and the underlying pace of payroll growth.

According to the Bureau of Labor Statistics, the household survey was little affected by the hurricanes, and that survey showed unemployment at 4.2 percent, a decline of seven-tenths over the trailing 12 months and the lowest reading since 2001. Thus, all three indicators I have mentioned—GDP, payrolls, and the unemployment rate—show above-trend growth.

While at 4.2 percent, the unemployment rate is below most estimates of the natural rate, there are not yet signs of a real acceleration in inflation or wages. It could be that we're just experiencing those long and variable lags and that pressures are building, or it could be that there is still some slack in the economy. And I'll mention two potential areas that are often cited as perhaps offering a modest amount of additional slack, the first being the level of the natural rate and the second being labor force participation.

So, with wide confidence intervals surrounding estimates of the natural rate, we should remain open to the possibility that it is lower than we may think. The Tealbook box by Jae Sim suggests that the natural rate may also move up and down with unemployment, and, intuitively, to me, that makes some sense. If there can be negative hysteresis effects, then why not positive effects? But while it is quite possible that the natural rate is materially lower than the 4.8 percent Tealbook estimate, or the 4.6 percent SEP median, or my own estimate of 4½ percent, it seems unlikely to me that it is materially below the current unemployment rate of 4.2 percent.

Wage developments and other labor market data are consistent with an economy that is near full employment. The Conference Board survey released this morning shows that the gap between the percentage of consumers who view jobs as plentiful and those who see jobs as scarce is at a 16-year high, although that gap is still far below readings of the dot-com era. Vacancy rates are at record-high levels, and many firms report they are having difficulty filling vacancies. Real wages appear to be growing in line with the pace of productivity, as theories suggest they should when we are near full employment.

Labor force participation data, on the other hand, may hold out the possibility of some remaining slack. Although participation had been trending down since its all-time peak of 67.3 percent in early 2000, there was a sharp 3 percent drop from 2009 through 2013. And, as

labor market conditions have steadily improved, participation has now been just about flat overall since September 2013. This flat performance has put us roughly back on—in fact, several tenths above—the staff’s estimate of the trend participation rate, which incorporates aging demographics and other long-term trends such as declining labor force participation by prime-age males.

Still, participation has been surprising us to the upside for several years now as the staff has raised their estimate of trend. So, with some caution, I would see this as evidence that a strong labor market can affect participation, at least in the short term, and repair some of the damage done in the wake of the crisis. This tentatively suggests that there may be some remaining room for further recovery in participation as the labor market continues to tighten. The relatively recent uptick in business investment, if sustained, would also suggest the possibility of repairing some of the supply-side damage created by the crisis.

With regard to inflation, as we’ve discussed in the past several meetings, the ongoing and unexpected weakness in inflation raises questions. After running at 1.9 percent during 2016, core PCE prices increased only 1.3 percent over the 12 months ending in September. The baseline narrative, which I have agreed with, has been that the decline is mainly a function of transitory factors that have little implication for underlying inflation.

The more troubling alternative narrative has been that weak readings may reflect longer-run factors such as a decline in inflation expectations or persistently lower inflation—for example, in medical care prices as a result of changing structural factors. I continue to lean toward the first narrative and have some confidence that we will see stronger data beginning early next year, particularly when the sharp decrease in mobile phone service prices drops out of

the 12-month data in March. More on that and the difficult tradeoffs that we face tomorrow.

Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kashkari.

MR. KASHKARI. Thank you, Madam Chair. Starting with inflation, as others have noted, core 12-month PCE inflation is very low at 1.3 percent on a 12-month basis. This is a large shortfall relative to our target of 2 percent. Core 12-month inflation has been declining since March.

Taking the longer-term perspective, how have we done on our inflation mandate since we officially adopted a 2 percent target in January 2012? The answer is “Not very well.” Headline PCE inflation has averaged 1.3 percent over this period. I’m trying to imagine how the Committee would react if we had 2.7 percent inflation, on average, for six years. I don’t think we’d react well to that.

What about our inflation forecasting record? Also, we’ve not done very well. Since 2012, both the staff and the SEP forecasts have consistently predicted inflation returning to target within the next two to three years. These forecasts have repeatedly proven to be too optimistic. The Tealbook forecasts that core PCE inflation will remain in the 1.3 to 1.4 percent range until at least March of next year and, even after that, will remain significantly below target. But, in light of our track record, this forecast may prove to be too optimistic.

So why is inflation so low, and why has it been so persistent? As I’ve explained previously, I see two likely explanations. The first, as Governor Powell just said, is that we have underestimated labor market slack and continue to do so. The prime-age employment-to-population ratio has been rising steadily over the past six years but still remains well below its

pre-recession level. As long as prime-age labor force participation keeps rising, the economy can continue to add significant numbers of jobs without much wage pressure.

The second explanation is that inflation expectations have fallen and weak expected inflation is suppressing actual inflation. Market-based measures of inflation expectations and expectations in the Michigan survey started to decline in 2014, right around the time the FOMC started to move toward the tightening cycle. We signaled higher future rates first through balance sheet normalization, then through a series of overly “hawkish” SEP forecasts, and then, finally, by four actual rate hikes. I think those are driving down inflation expectations.

So what lessons can we learn from this recent performance? Inflation is too low, and inflation expectations are too low. I can understand the logic of the Phillips curve driving inflation higher. I personally don’t buy, in the staff’s forecast, that inflation expectations are going to drift back up just because we say it. I think that our policy is what’s driving inflation expectations. I believe we’ve been too hasty in removing accommodation. Had we moved more slowly, under a conventional view of how monetary policy works, I think we’d now have higher inflation and higher employment. Expectations of continued tightening have depressed expected inflation and continue to do so. Continued tightening this year in the face of falling actual inflation, I believe, is calling into question our commitment to our symmetric 2 percent inflation target.

Let me just add one anecdote to piggyback on President Bostic’s anecdote about the labor market conditions. I had similar conversations around my District. So I decided to look closer to home, and I asked our HR department, “How easy or hard is it for us to hire people?” They report that, this year, the average number of applications per job posting at the Minneapolis Federal Reserve is 63, and that is down from 77 in 2012. But, in short, we have no trouble

hiring, and I can't imagine the Minneapolis Reserve Bank is any different from your Banks or the Board of Governors, and the Twin Cities has officially a 3 percent unemployment rate. So in a 3 percent unemployment market, we get 63 applications per job postings. Now, you may say that this isn't scientific because we're just poaching from other employers and we're a premium employer.

Let me give you a more specific example. We just conducted a search for a new vice president and head of public affairs, and I was deeply involved in the search myself. I personally reviewed all 28 of the most qualified resumes that we got. Of those 28 very, very highly qualified resumé's, almost 20 percent were people that I would consider to be partially employed—meaning an individual with consultant's fees, somebody between a full-time job—but, I guarantee you, in the surveys, they're all counted as fully employed. This is just an anecdote. We're all reaching for anecdotes to try to make sense of the conflicting data we're seeing. This anecdote—and I would ask you to ask your own HR department—suggests that there is still slack in the labor market. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you, Madam Chair. Although hurricane-related disruptions have made interpreting the recent economic data somewhat more difficult, the news, on balance, is consistent with an economy that continues to grow at an above-trend pace. In fact, the data suggest that the underlying pace has quickened a bit from the 2 percent annual rate that we've seen in recent years.

In assessing the outlook, I don't see any strong reasons to expect a big shift in momentum over the near term. The fundamental supports for continued growth look good. Household real income is rising, bolstered by continued job gains and rising compensation trends, and

households generally don't appear to be overextended, taking into account the slow growth rate of household debt and sharp gains in household wealth. One potential vulnerability, though, is that we have seen a recent decline in the household savings rate, perhaps driven by rising household wealth and confidence.

Business fixed investment also looks good, supported by rising profits and a tightening labor market. It gives businesses incentives to substitute capital for labor. I think that's one reason why we're seeing a pickup in business fixed investment. The global outlook has also improved, and, as Governor Powell noted, tax cuts and fiscal stimulus do appear more likely. While top-line real GDP growth might slow a bit next year, due to a lower contribution being made by inventory investment, I don't see the type of excesses in the U.S. economy that would foreshadow an early end to the current expansion.

In terms of fiscal policy, if there is a deal to be made, I expect it to be much more in the direction of tax cuts as opposed to tax reform. That's because it's much easier to keep a majority together when you're handing out tax cuts. Tax reform is much harder, because there are losers for every winner. If fiscal policy does turn more expansive, this would likely provide further momentum for the U.S. economy in the medium term. How much is difficult to say at this point, with the uncertainties about what will be enacted, when it will be enacted, and the composition and timing. I also think a sizable fiscal stimulus program would significantly raise the prospect for an economic hard landing later. If fiscal policy turns expansive, we may be forced to step on the brakes much harder. I also think it will be tougher to calibrate how much is the right amount of pressure. Also, the issue of fiscal sustainability could become a concern again, and this could lead to higher risk premium and more volatile financial markets.

I think it's noteworthy that the federal deficit actually increased in the most recent fiscal year, to around 3.5 percent of GDP. That's not a good performance when the economy is operating close to full employment. As a way of comparison, let's look at the budget deficit in fiscal year 2007, when the budget deficit was 1.1 percent of GDP. That was a comparable point in time in the business cycle. Regardless of what happens in terms of tax policy, I expect the deficit to move higher for several other reasons, including higher debt service costs due to more debt and higher interest rates, and higher entitlement spending as the baby-boom generation retires.

Just on the debt service side, the numbers don't look good at all. In the most recent Congressional Budget Office projections in June, they projected that federal debt service costs are going to triple over the next decade, rising to \$818 billion per year in 2027. Then add on \$1½ trillion of tax cuts over 10 years on top of that—and that \$1½ trillion of tax cuts might be a conservative number, depending on how dynamic scoring is used to score this fiscal program. This strikes me as a recipe for a very bumpy ride. Fiscal stimulus at the time that the economy is operating very close to full employment is hardly well timed. If this is what we get, I expect this is going to make it considerably more difficult for us to achieve our dual-mandate objectives over the longer term.

On the inflation side, the data continue to be softer than expected, as people have acknowledged. Despite this, I'm very reluctant to junk our Phillips curve framework for four reasons.

First, the inflation data are noisy. So I don't think we want to take too much signal from low inflation readings, especially when we can identify special transitory factors that account for at least some of the downside surprise.

Second, the tighter labor market does seem to be generating somewhat greater wage pressure. So the construct of the Phillips curve still seems workable to me.

And, third, what's the alternative? If you argue that the level of slack in the economy has no effect on inflation, what exactly is your model of the inflation process? Left with a model that inflation only depends on inflation expectations is not very satisfying. It doesn't get you very far, because it leads to the next obvious question: So what the heck do inflation expectations depend on?

Fourth, despite the softness in core inflation, inflation expectations have been generally steady recently, albeit at low levels. This is the case regardless of whether you look at the household surveys, such as the University of Michigan, or the New York Fed's Survey of Consumer Expectations, the Survey of Professional Forecasters, or breakeven inflation compensation based on yield differentials between nominal and inflation-protected Treasury securities. If inflation expectations were falling right now, then I would be much more concerned about the recent softness in core PCE inflation.

So when I put it all together, financial conditions are easy. Fiscal stimulus looks more likely. Growth abroad is strong, and the economy's underpinned by accommodative monetary policy. This suggests to me that the risks to growth are skewed to the upside at the time that the economy is already operating close to full employment. So, for me, assuming this outlook persists over the next six weeks, I would favor tightening monetary policy at our next meeting, but more on that tomorrow.

Finally, a few words about Puerto Rico and the Virgin Islands, which are both part of the Second District. The devastation to both islands was very severe. Puerto Rico is by far the bigger entity, so let me focus on that. The recovery, as you've read about in the press, is

occurring very slowly. Although gas stations and ATMs are mostly back online, power generation remains a huge problem, with less than 30 percent of the electricity grid operable now. That's pretty amazingly poor performance six weeks after the hurricane hit.

I expect that the longer these outages persist, the more out-migration will take place, and we'll have a situation like New Orleans after Hurricane Katrina in which the population never fully recovered, probably not as big a decline in percentage terms because it's just much harder to move off an island.

Of course, the situation in Puerto Rico is further complicated by the island's fiscal problems. While the Congress may continue to provide aid to help the island get back on its feet, I suspect that Hurricane Maria will end up leading to a much more significant restructuring of the debt over the longer term. In recognition of this, outstanding Puerto Rican municipal debt has plunged in price following Hurricane Maria, and there's still a little bit of differentiation between the different types of bonds. We have general obligation bonds, COFINA bonds, PREPA bonds, and so on. The differentiation between the different security classes has diminished over time, which I think is interesting.

At present, the financial system is limping along, with the economy operating very much on a cash basis. In the aftermath of the storm, cash demand surged, and we had to go to extraordinary lengths to ensure that sufficient cash was available. We did so with the help of the Federal Reserve Bank of Dallas. So, thank you, Rob.

The situation is gradually stabilizing, but there's a long way to go before we get back to a normal situation. We have a functioning banking system, but it's mainly running on power coming from diesel fuel generators. Besides ensuring sufficient cash was available, we've also been helping our staff be able to donate materials and supplies to the island, and we've been

assessing what else we can do as an institution to help. Over the medium term, this is likely to include setting up a number of technical assistance forums for small businesses and one-stop forums to help households access the recovery and rebuilding resources that will be available to them. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. My thanks to everyone for a thoughtful discussion of the economic outlook and risks. I'd like to wrap up the round with some comments on incoming data and my perspective on the decisions we face both tomorrow and in December. As many of you noted, the limited data we've received since our September meeting are more difficult to interpret than normal because of the hurricanes. The staff's best guess is that storm-related disruptions reduced payroll gains by about 200,000 in September and will boost them by 150,000 in October and 50,000 in November.

On growth, the staff estimates that the hurricanes lowered GDP growth $\frac{1}{2}$ percentage point at an annual rate in the third quarter but will likely reduce growth almost $\frac{3}{4}$ percentage point in the fourth. But, as David Wilcox emphasized, these estimates are unavoidably imprecise. So until the effects of the storms wash out of the data in a couple of months, it will be harder than usual to assess the underlying pace of growth in employment and output.

That said, it appears that underlying growth in both employment and output remained solid through the third quarter. Storm-adjusted payroll gains look to have averaged about 160,000 per month from July through September, compared with 185,000 per month over the preceding 12 months. Inherent noisiness in monthly data and uncertainty about the effects of the hurricanes make it premature to reach firm conclusions, but this apparent step-down in the pace of job gains could signal that employment growth is now slowing to a more sustainable pace in

response to our gradual removal of policy accommodation, a development I consider quite welcome.

It appears that the labor market is continuing to tighten, but I don't yet consider it overheated. Both the narrow U-3 and broad U-6 measures of unemployment ticked down in the September household survey, and these indicators do not appear to have been markedly affected by the storms. In addition, the labor force participation rate and employment-to-population ratio for both prime-age workers and all adults moved up.

Of course, month-to-month changes in these series can be noisy, so we shouldn't read too much into any single labor market report. And caution also seems to be in order, as other indicators received since our previous meeting—including data on quits, hires, and job openings; hiring plans as reported by Manpower and the NFIB survey; household assessments of job availability; and small firm assessments of difficulties in filling jobs—on balance, suggest little change in labor utilization in the third quarter.

Average hourly earnings moved up noticeably in the September report, but the hurricanes likely boosted this measure by shifting the distribution of wages toward higher-income individuals. In contrast, this morning's report on the ECI appears not to have been affected by the hurricanes. That measure, which rose 2.5 percent in September over a year earlier, suggests that nominal wage growth has picked up a bit but remains fairly subdued.

This is consistent with the comments I've heard around the table. That assessment also seems broadly consistent with what we're hearing from our business contacts, who continue to report intensifying efforts to expand their workforces through a variety of means, including bonuses; various nonwage entitlements like measures to increase job flexibility, as President Bostic mentioned; training; and targeted, but not broad-based, acceleration in wages.

I continue to expect that overall growth will run somewhat above potential into early next year, producing some further tightening of labor market conditions. But the growth will slow in 2018 as we gradually remove the limited amount of policy accommodation that remains, thereby allowing labor market conditions to stabilize and preventing the economy from materially overheating.

Ongoing gains in labor income and wealth look likely to support consumer spending in the coming months and into next year, while business investment, in contrast to last year, is expanding at a solid pace. And the prospects for further solid growth appear good in light of current readings on business sentiment and the ongoing recovery in drilling activity. Furthermore, as Beth Anne discussed, the foreign economic outlook remains favorable and should support export growth through the rest of this year and beyond.

My expectation that growth is apt to moderate next year reflects not only the further removal of monetary accommodation, but also my assessment of overall financial conditions. I judge them to have tightened a bit since our previous meeting. Stock prices have continued to rise, but the dollar has also appreciated, and FRB/US model simulations suggest that the stimulus to aggregate spending coming from the former should be modestly outweighed by the drag coming from the latter. In addition, I find the continued rise in equity prices and other signs of rising valuation pressures that Dan Covitz discussed disquieting, and it would hardly be surprising if there was, at some point, a market correction. I finally note that fiscal policy remains an upside risk to the outlook, although it's still quite uncertain how this will play out.

With regard to inflation, the latest monthly data confront us with yet another unexpectedly weak reading, and, taking some signal from this downside surprise, the staff have slightly revised down their forecast of core PCE inflation next year. Again, one shouldn't take

too much out of one report, and even on a 12-month basis, core inflation can fluctuate appreciably from year to year for reasons that ultimately prove transitory. For that reason, I continue to anticipate that PCE inflation will move back up to 2 percent over the next two or three years, supported by moderately tight labor market conditions and stable inflation expectations.

But I must confess that as each month goes by without a pickup in the monthly data, my confidence in this story slips a bit further. And I am concerned that some more persistent influence may be at work, which could necessitate even lower paths of the unemployment rate and funds rate than I currently foresee in order to achieve our 2 percent inflation objective. As I discussed in a recent speech, I think it's critical that this Committee continue to be open to this possibility and revise its estimate of the sustainable rate of unemployment and other factors as called for by incoming data. In light of the prolonged inflation shortfall, we need to be concerned with the possibility that inflation expectations could slip, but, at the same time, we must also be cognizant of the risks associated with allowing the labor market to tighten further and further, as the ultimate adverse effects of such tightening on inflation and financial stability may be slow to emerge.

So where does all of this leave us with respect to our policy decisions? Fortunately, we're in a good position to leave the target range for the federal funds rate unchanged at this meeting, waiting to see what incoming data suggest about the outlook for the labor market and inflation. Certainly, market participants don't expect us to take any action at this meeting.

As we look ahead to our next meeting, market participants now place a high probability on our raising the target range in December. This assessment slightly overstates my own confidence that incoming data will justify such a step, and I intend to keep an open mind. But I

do not think it would be advisable to try to adjust the market's expectations at this point. I would instead recommend waiting to see how market expectations evolve over the next few weeks in response to incoming data. If market expectations appear to be considerably out of step with our thinking as the time of our next meeting draws nearer, we can consider then what type of guidance to the public might be appropriate.

With regard to setting policy over the medium term, I believe that the strategy we've articulated remains reasonable—specifically, gradually raising the federal funds rate back to neutral over the next few quarters, with adjustments beyond that horizon dependent on our assessment of how the neutral rate is evolving.

I found the memo on the implications of uncertainty for monetary policy that was distributed last week to be quite helpful in understanding a key reason why this strategy is appropriate. As the memo illustrated, macroeconomic performance is better served by a balanced approach to setting the federal funds rate that responds both to deviations in inflation from our 2 percent objective and to deviations of unemployment from the estimated longer-run normal rate rather than one that unduly weights one gap or the other. Beyond this key lesson of the memo, we also need to keep in mind one that it didn't emphasize—namely, the need for us to continue to recalibrate our thinking about the appropriate policy rate path in light of surprises in incoming data that influence our medium-term outlook.

Let me stop there, and rather than going to Thomas for his briefing, I think we should wait until tomorrow. I know some of you are anxious to head off for trick-or-treating [laughter], but let me, in closing, remind those of you who do not have plans for trick-or-treating that a reception is available in just a couple of minutes downstairs in the West Court Café. Everyone is invited to the reception. There will be a dinner afterward, and if you have RSVP'd that you are

planning to attend, you are welcome to come, and there is no formal agenda. We will reconvene tomorrow at 9:00 a.m. for Thomas's briefing. Happy Halloween.

[Meeting recessed]

November 1 Session

CHAIR YELLEN. Good morning, everybody. Let's get started. And we're going to start off by turning to Thomas for his briefing.

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

As several of you noted in the previous go-round, the combination this year of an unemployment rate that has moved below your estimates of its longer-run normal level and inflation that has remained below your objective highlights some important areas of uncertainty that you are confronting. The upper-left panel lists a few.

These questions have so many dimensions that, in the memo regarding economic uncertainty and misperception that you received last week, we had to narrow our consideration to just a few key issues. I will note some omissions later in my briefing. The upper-right panel cites the key dimensions of uncertainty that the memo considers: the level of the unemployment rate that is consistent with stable inflation in the longer run, u^* , and two key parameters of the Phillips curve—namely, the strength of the link between resource utilization and inflation, and the persistence of movements in inflation. The memo reviews some plausible estimates, derived from the historical record, of the magnitude of uncertainty about these features of the economy. In particular, a plausible estimate of the 70 percent confidence interval associated with the current Tealbook estimate of u^* of 4¾ percent ranges from 4 percent to 5½ percent. In addition, the parameters of the Phillips curve have undergone substantial changes over the past two decades, with the slope having flattened and persistence having lessened significantly. We do not fully understand the reasons why these changes have occurred.

The three policy strategies evaluated in the memo—a balanced-approach rule and two variants—can be regarded as points on a spectrum of policy responses that put different emphasis on stabilizing inflation at 2 percent versus stabilizing the unemployment rate at the potentially mismeasured level of u^* . These strategies are evaluated using a loss function that equally penalizes squared deviations of inflation from 2 percent and of the unemployment rate from u^* . The evaluation of the performance of each strategy is undertaken over an extended horizon using stochastic simulations deviating from the September Tealbook baseline that allow for a wide range of shocks to hit the economy. The prevalence of shocks driving economic activity and inflation in opposite directions—often labeled "supply shocks"—as well as the presence of the effective lower bound drives the tradeoffs between strategies.

The middle two panels summarize the main results of this analysis. The left panel focuses on uncertainty and misperception about u^* . Previous research has emphasized that a stronger focus on inflation stabilization is an appropriate means of

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

addressing the uncertain nature of u^* . In our analysis, however, we find that this rationale for a strategy that gives priority to inflation stabilization may have less force in current circumstances for two reasons. One is that we conduct the analysis starting not from a steady-state baseline, but using an outlook that features significant undershooting of unemployment and inflation. Furthermore, in our benchmark simulations, the short-run Phillips curve is very flat, implying that gains in inflation stabilization are achieved at the cost of, on average, substantially larger undershooting of the unemployment rate. For example, the probability of the unemployment rate running below 3½ percent at the end of 2019 increases notably as the policy response to inflation becomes more forceful, but stabilization gains for inflation are comparatively small.

The second source of uncertainty is whether a prolonged period of very low unemployment rates could lead to undesirable changes in inflation dynamics. The middle-right panel summarizes results for the case in which the Phillips curve is much steeper, and changes in inflation are more persistent, than in the benchmark simulations, as was the case in the period from the mid-1960s to mid-1980s. For any given policy strategy, this change in parameters means that an undershooting of unemployment generates a larger shift up in inflation. In particular, the likelihood of inflation outcomes below 1 percent at the end of 2019 is greatly diminished, but outcomes in which inflation exceeds 4 percent in late 2019 turn out to be also very unlikely. Put differently, although the Phillips curve parameters are obtained from a sample that includes the 1970s, they do not, by themselves, lead to the inflation outcomes observed in that decade. Notwithstanding the stronger response of inflation to unemployment, moving inflation closer to target is still costly in terms of unemployment because of the more inertial inflation process. Thus—much like the case involving a misperception of u^* —the analysis finds that a rule that responds about equally to inflation and unemployment gaps outperforms, on average, a rule that responds more strongly to inflation.

The lower-left panel lists some considerations that the memo did not address. Importantly, the benchmark Phillips curve specification implies that inflation expectations are exerting a strong gravitational pull, whereas the 1970s-style Phillips curve allows for more persistent inflation misses. But the public does not doubt the central bank's commitment to its 2 percent objective in any of the simulations. You may be concerned that, after several years of inflation being below your objective, the risk of an erosion of inflation expectations may be substantial. Unfortunately, as discussed at your previous meeting, we do not have a clear understanding of how the longer-run inflation expectations relevant for actual inflation outcomes are being formed. Another assumption you may question is the loss function that weighs unemployment running above or below u^* symmetrically. If you view the costs of unemployment running below its longer-run normal rate as smaller than the costs of unemployment running above its longer-run normal rate, then a strategy tilted toward inflation stabilization would become more attractive in current circumstances, all else being equal. Two other important considerations—the possible emergence of financial stability risks in an environment of tight resource utilization and the possibility of hysteresis effects—are likewise beyond the scope of the memo.

What are the implications of this analysis for your policy decisions today and over the coming months? There is no simple mapping between the policy strategies considered in the memo and the policy alternatives before you at this meeting. Our goal was to explore the possible implications of some of the uncertainties that you are confronting, recognizing that your views on their relative importance will no doubt evolve over coming months. If you remain reasonably confident that longer-run inflation expectations are well anchored, you may want to acknowledge the continued downside miss on inflation, as alternative B does, but note that the ongoing strengthening in the labor market and the expected firming in inflation are likely to keep you, for some time, on a path of gradual hikes. In addition, you may view a more aggressive response to low inflation under current circumstances as undesirable because of how far the unemployment rate may need to drop, and you may feel uncertain about the consequences of letting the unemployment rate decline much further. However, if you are more concerned about an erosion of longer-run inflation expectations, the benefits of a more forceful response to low inflation could be substantially greater than suggested by the analysis in the memo, which assumed stable longer-run inflation expectations. In that case, signaling a willingness to put further rate hikes on hold, as in alternative A, may be attractive. Finally, if you think that the already low level of the unemployment rate sufficiently diminishes the risk of low inflation outcomes over the coming years while appreciably raising the risks of a future hard landing, you may want to emphasize the need to slow employment and real activity to sustainable growth rates, as in alternative C.

Thank you, Madam Chair. That completes my prepared remarks. The September statement and the draft alternatives for the November statement and the associated implementation note are shown on pages 2 to 11 of the handout. I will be happy to take any questions.

CHAIR YELLEN. Are there questions for Thomas? President Rosengren.

MR. ROSENGREN. Just one question on your additional considerations and in order to get a little more of your view of whether undershooting unemployment is less costly than overshooting. Clearly, there's a benefit because you bring people who are more marginally attached to the labor force back in, but how do you think about the financial stability risks? So, pushing the labor market very tight, you'll probably hit your inflation target more quickly. Has the staff done work to think about periods when the unemployment rate gets below 4 percent—what is the likelihood of having a financial stability problem?

That would get at some of those costs. So if you think of it only in terms of unemployment and inflation, there's really not much cost. But if you add the financial stability

element, it's really thinking about a Taylor rule in a much more dynamic sense of, how likely is pushing beyond a sustainable rate likely to cause a very high unemployment rate in the future? I don't know what your thoughts are on that. And we normally don't have a lot of discussion about financial stability in this part, but I think, considering the Tealbook's forecast of 3.6 percent, which is getting much further below the u^* that the staff is currently using—what is your view of what the costs are of pushing the economy to be that tight?

MR. LAUBACH. You may recall that, in December last year, we sent you a memo. Broadly, we like to refer to it as the undershooting memo, in which we looked into previous episodes of very low unemployment and how those episodes ended, to what extent a soft landing was achieved, and to what extent they ended with higher inflation and this Committee having to step on the brakes more forcefully. In discussing this matter, I'm now looking a little bit in the direction of Andreas.

I don't think that, in that instance, we looked deeply into financial stability considerations per se, in part, I'd argue, because some of these episodes, of course, are quite a while ago. The late '90s come to mind, for example. And I'm not quite sure to what extent we think that the observation of tight resource utilization as such was symptomatic of other things going wrong that might have led to financial stability problems.

MR. LEHNERT. And that's right, President Rosengren. Just as one historical example: The savings-and-loan episode of the late 1980s and early 1990s. That was not really an episode of superhot labor markets that caused that particular set of problems. It was more about regulatory developments and the interest rate environment.

The late '90s episode—to what extent very tight labor markets played through in asset prices—the causation may have run the other way. In any event, that wasn't one in which there

was a lot of overborrowing and hence a lot of excess leverage in the system, so my reading is, the macro consequences played out as expected.

I'll defer to Thomas on the larger issue of financial stability and monetary policy here. But this record of historical episodes is not a smoking gun or *prima facie* evidence of there being this necessary or sufficient connection between the two.

MR. ROSENGREN. Thank you.

CHAIR YELLEN. President Kaplan.

MR. KAPLAN. I guess I'll ask a follow-on question. And maybe it isn't an area of uncertainty for us, but for me, I think it is, and this is building on what President Rosengren was saying. The risk for uncertainty about imbalances building—for me, primarily in the nonbank financial sector, because we have a reasonably good grip, due to stress testing, on banks. I'm wondering, are imbalances building in the nonbank financial sector? And how confident are we that we have a good grip on whether imbalances are building, in view of our imperfect visibility into that sector? That, for me, is a question.

MR. LAUBACH. I'm afraid that—it's Andreas's call, really, because, you know, this is fundamentally a question of where we see financial stability risk, potentially, in that particular sector. Go ahead, Andreas.

MR. LEHNERT. Yes, one way to think about imbalances building is to be a little bit agnostic about where the source of those imbalances is and to simply look at the financial positions of households and businesses. And there, the story really is one in which we do not see a big spurt of borrowing by either households or businesses at the moment.

In the business sector, the story there is slightly nuanced. We did see very rapid growth, in particular, in corporate borrowing in the early part of the recovery period—let's call it the

2010–14 period. And during that time, in part because asset prices were elevated, risk appetite was clearly very elevated, and this particular segment of borrowers found credit relatively easy and cheap to get. We saw a very rapid growth in credit there. Now, that was facilitated using a variety of different sources, primarily nonbanks, but banks certainly played a role there as well. So you had the leveraged lending market and the high-yield corporate bond market as well playing a role.

That ended, technically, with, for a variety of reasons, leveraged lending guidance, the taper tantrum, and the oil price collapse that began in 2014. Since then, what we've seen is, borrowing at the risky end of the corporate spectrum has really been pretty sluggish, and actually, even, if anything, it's been a story of balance sheet repair in that sector.

In the household sector, debt has grown over the long horizon, since the depths of the recession, in line with income—maybe a little bit slower or maybe a little bit faster.

MR. KAPLAN. It makes sense to me that we have a good grip on what's going on with business debt. We have a good grip on what's going on in the household sector. I guess my thinking is a little bit colored by the recent past of whatever the number was, \$70 trillion to \$90 trillion of CDS, which were not easy to see. I'm wondering particularly about derivatives or margin debt or other excesses in the shadow banking system. I gather—and this is a question: How confident are we that we have good visibility as to what's going on there?

MR. COVITZ. Sure, there are some exceptions to the leverage story, and, outside the shadow banking system, Andreas talked about corporate leverage building. In the shadow banking system, I think you're right to think about margin debt and other types of securities loans. We have data on that for hedge funds through, I think, July of this year. That has actually shown an increase in 2017 in a way that the staff noted in the QS assessment and were a little

alarmed by. But that's not a great measure of hedge fund leverage, as you know. We should be thinking about derivatives and repo on top of that. There is Form PF data that incorporate those activities as well, but, unfortunately, that's incredibly lagging, so it's only through 2016. Those data show no increase in leverage among hedge funds, but only through 2016. I think it's really important what the next round of Form PF data have to say, and I hope the staff are actually working on getting those data from the SEC more frequently and in a more timely fashion.

The only other pocket in the shadow banking system that we've talked about is in the insurance sector, and there, there are certain activities—funding asset-backed securities agreements, or FABS, which I mentioned in my briefing, and securities lending activities. Those don't amount to a huge amount of money right now, but we're definitely paying attention, and that is something that we track.

MR. KAPLAN. Thank you.

CHAIR YELLEN. Any further questions?

MR. LAUBACH. If I may just quickly return to President Rosengren's question: It seems to me, on the basis of listening to this, that one dimension to explore would be, what we are typically concerned about is very aggressive pricing of risk. So the question is whether episodes of a very strong economy and very tight labor markets have historically been associated with there being what looks in hindsight as overly aggressive pricing of risk.

CHAIR YELLEN. Further questions? [No response] Okay. Before we begin our policy round, I want to briefly mention one open question in all of the statements, which pertains to paragraph 5, on our balance sheet. And we have a sentence there that we've left in brackets because it's an open issue. So we asked for feedback. Some of you gave us feedback in your comments on the alternatives, and others of you I talked to before the meeting, so I have some

sense of what the distribution of opinion is, although, of course, I welcome your comments on this in the round.

One option here is to delete the entire paragraph and say absolutely nothing about the balance sheet. The desirability of that would come from the fact that we intend our balance sheet to run down, following the principles we've enunciated, and this is something we want to run quietly in the background. We don't want the public to think it's something we're revisiting at every meeting, and saying absolutely nothing might convey that there's nothing under consideration. So that's one possibility.

On the other hand, we have a huge balance sheet. It is having an effect on monetary policy. We only started our program of running it down this month, so suddenly going utterly silent about something that has been central to monetary policy also seems like an extreme outcome.

It seems to me that both of these views have merit, and, following the principle of "If in doubt, split the baby," I would propose the following as a way to resolve this and would welcome your reactions. I would say I am open to anything that the Committee clearly wants to do here. But one possibility would be to leave the red sentence in, include it in alt-B this time, and next time we could get rid of it. Next time, there's a press conference. If we were to omit it next time, I could point to it explicitly in the press conference and say "the Committee decided rather than saying the same thing every time so that it's becoming boilerplate that this is a process that's ongoing—running in the background—and we made a conscious decision to omit it." I would propose that as the way to resolve this and would welcome, as we go around, your comments on that. Specifically, if anybody has a significant concern about proceeding in that fashion, please say so.

So, with that, let's begin our round and start with President Harker.

MR. HARKER. Thank you, Madam Chair. Let me begin my remarks by expressing my heightened concern due to the “Williams effect” and the Dodgers’ victory last night. I say, for the good of the nation, go Astros. [Laughter]

I support alternative B at this meeting. It leaves December open for a rate hike, but it does not commit us to take action, which I believe is the appropriate policy stance at this moment. What I would like to discuss are some issues and challenges that I and the staff in Philadelphia believe current monetary policy is facing. Now, I've not arrived at any definitive position on what I regard as a very complex topic. The issues revolve around the potential difficulty of hitting our 2 percent inflation target in a low- r^* environment. The nonlinearities induced by the effective lower bound could imply that, on average, inflation will be somewhat lower than 2 percent if we maintain a symmetric policy regarding the undershooting and overshooting of our target. Such an outcome could lead the public to believe that we are incapable of hitting our target on a regular basis. Such a belief would unanchor inflation expectations, making hitting the target more difficult.

This leads me to question about whether our current means of conducting policy are the most efficient. Of perhaps even more importance are the economic costs arising from the increased probability of hitting the effective lower bound when r^* is very low.

Now, there are many different ideas that have been floated for resolving the problem of persistently low inflation and the increasing probability of hitting the effective lower bound. Some have called for raising the inflation target, but, operationally, I think we would need to see inflation rise above 2 percent before that would become a viable option. If we want that to be an option, do we adjust the current policy to make that a more likely outcome, or should we wait for

some opportunistic inflation to occur? Some have suggested moving to a price-level target, but that option, like raising the inflation target, needs much more detailed analysis before becoming a new basis for conducting monetary policy. Alternatively, should we keep the 2 percent target and operate with an asymmetric loss function?

If we do decide to change the conduct of policy, there are important timing issues that need to be considered. For instance, do we wait to understand the full implications of balance sheet normalization before making any policy adjustments? Now, I fully admit I do not have the answers to these questions, but I would urge the Committee to begin detailed discussions concerning the implications of a low- r^* environment for the conduct of policy.

Finally, regarding paragraph 5, I agree completely with including the sentences in paragraph 5 and then dropping it in all subsequent statements. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Mester.

MS. MESTER. Thank you, Madam Chair. I can support alternative B and the statement as written, with paragraph 5 on the balance sheet included.

Incoming data are consistent with my medium-run outlook of growth above trend, strong labor markets, and inflation gradually returning to our goal. Against the background of the progress on our dual-mandate goals, my outlook is conditioned on maintaining our strategy of gradually removing policy accommodation. This gradual path doesn't entail an increase in the funds rate at each meeting, so I'm comfortable with no change in rates today. However, I anticipate that, so long as conditions remain largely as they are today and remain consistent with the outlook, I'll support an increase in the funds rate in December. If conditions evolve as expected, this won't surprise the markets.

In my view, this gradual removal of accommodation gives us the best chance of sustaining the expansion. I note that this strategy is a data-dependent one. Over time, as the inflation data have come in weaker than anticipated, pushing out the projected time at which inflation returns to our goal, the gradual path has flattened. The flattening also reflects the now somewhat lower estimates of the longer-run neutral rate, this reassessment itself being a response to incoming data.

I also note that the strategy of gradual removal of accommodation is a balanced risk-management approach. Our gradual path incorporates adjustments to incoming data that affect the medium-run outlook. It incorporates the uncertainty regarding the inflation forecast and the risk that inflation may take longer than anticipated to rise back to 2 percent, or that price pressures may reassert themselves more than anticipated. It incorporates uncertainty about estimates of the natural rate of unemployment. It incorporates the potential buildup of risks to financial stability arising from keeping interest rates low for so long. It also incorporates the risk of financial conditions remaining very accommodative despite the increases already made to the funds rate.

I view the fact that the median path in the SEP is quite a bit flatter than the path in the Tealbook, the paths implied by various policy rules, and the paths in almost all of the optimal control exercises in the Tealbook as an indication that we are being appropriately prudent in the presence of the risks. But those differences also suggest that we should continue on the path of gradual removal of accommodation.

In my view, we would be taking on excessive risk by focusing only on the undershoot of inflation and ignoring the projected undershoot of the unemployment rate from real-time estimates of the natural rate even though those estimates are imprecise. In addition to the

inflation risk, allowing the unemployment rate to run well below its natural rate for some time could entail supply-side costs, such as inefficient job matching; reduced labor market dynamism, as we discussed yesterday; and affect people's decisions about entering the job market instead of furthering their education, which could lower productivity growth in the longer run.

In a typical DSGE model, these costs are reflected in the welfare-based loss function, which is well approximated by the familiar quadratic loss function that penalizes both positive and negative deviations of unemployment from its natural rate and inflation from its target. The Board staff memo provides a convincing case that taking a balanced view and setting policy so that it's responsive to both parts of our dual-mandate goals is likely the most effective approach to achieving our longer-run objectives.

Finally, I would like to include paragraph 5, the brief mention of our balance sheet normalization program, in our statement. I firmly believe that we need to be transparent about our policy decisions, and, while we want balance sheet normalization to be in the background, omitting any reference to it seems contrary to transparency. The FOMC's postmeeting statement is its official statement about policy, and the balance sheet is part of our policy. I think that the brief statement in paragraph 5 balances the desire to be transparent without unduly emphasizing the balance sheet and seems a simple way to remind the public in our statement that balance sheet normalization is ongoing, in accordance with our previously announced plan. And I defer to the Chair on whether to keep this sentence in next time. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. I support alternative B. While no action at this meeting is appropriate, taking into account the fact that we've just begun to shrink our balance sheet and recent data have been obscured by the hurricanes, I do expect it to be

appropriate to raise rates in December. Fortunately, this view seems to be widely shared in the market, so there is no need to move the market by tilting the language in that direction.

The economy has been stronger than anticipated despite the effect of natural disasters, and I expect further tightening in labor markets to place upward pressure on wages. Although inflation readings are low, I do not see evidence that the basic wage–price dynamics have changed profoundly. Price data are noisy, and I expect that we will see higher inflation numbers next year, as some of the idiosyncratic price shocks leave the data and labor markets continue to tighten.

Finally, I do worry about “reaching-for-yield” behavior when interest rates are so low. Very narrow interest rate spreads and high valuations for commercial real estate are consistent with investors taking more risk despite some significant potential tail risks.

In terms of paragraph 5, I’m fine with what you’ve suggested, which is to keep the sentence in for this meeting and then take it out next time.

CHAIR YELLEN. Thank you. President Williams.

MR. WILLIAMS. Thank you, Madam Chair. I support alternative B. I also support your proposed approach to the language in paragraph 5 regarding the normalization of the balance sheet. It’s a testament to your leadership of our preparations, discussions, and communications regarding balance sheet normalization plans that we now find ourselves debating how soon to drop all references to the whole thing. So I think that’s a great accomplishment.

That said, I think it actually is important for us not to lose sight that we are tightening monetary policy, albeit gradually, as we normalize the balance sheet. So although I understand that, in our external communications, you can drop the sentence for paragraph 5 in December, I

don't think we should lose sight of that aspect—going back to what President Mester said about this being a policy decision, and that these are actions we are carrying out, even if in the background.

The economy continues to grow above potential. We're in the midst of a substantial overshooting of our full employment goal, and, taking into account the usual lag in the response of inflation to utilization as well as the dissipation of some transitory factors that have held down inflation this year, I expect renewed progress toward our inflation target over the next year.

In this outlook, I've maintained my policy assumption in my September SEP forecast of one more rate increase this year. I will closely watch the incoming data, but, because of the strength of the economy and the solid momentum we are seeing, I have a high bar for surprises that could change my mind about the appropriateness of a December rate increase.

Now, we've agreed to take a balanced approach to dealing with misses to our dual-mandate goal. In this regard, it's important to note that underlying inflation is undershooting our long-run target by about as much as unemployment is undershooting its long-run level. In fact, in the Tealbook projection, the situation becomes increasingly imbalanced as the unemployment rate falls well below 4 percent, and these conditions recommend moving monetary policy back to neutral—gradually, yes, but not with timidity.

The likely prospect of running the economy above potential for an extended period of time may have adverse consequences. For unemployment, the converse of the usual rule is also true—that is, what goes down must come up. And to reverse the deep undershoot of the unemployment rate, the long-run Tealbook projection calls for a lengthy period of policy tightening to return the economy back to the steady state. This tightening results in a forecast of

an unprecedented inversion of the yield curve. Specifically, the funds rate is projected to move above the 10-year Treasury rate for more than three years beginning in 2020.

Now, a yield curve inversion of this duration would likely be very problematic. A large literature, including work done by Glenn Rudebusch and myself, confirms that inversions of the yield curve are one of the few reliable indicators of future recessions. Since the 1970s, the U.S. economy has had six extended inversions of the yield curve. And, each and every time, these inversions coincided with, or were shortly followed by, a recession, as dated by the National Bureau of Economic Research. Furthermore, these past inversions lasted only about a year or less. An inversion that lasted three years, as in the extended Tealbook, would almost undoubtedly be followed by a recession, based on this analysis. And such a risk illustrates another channel through which continuing a too accommodative policy stance may re-create vulnerabilities down the road. Thank you.

CHAIR YELLEN. Thank you. President Bullard.

MR. BULLARD. Thank you, Madam Chair. I organized my comments as reactions to some of the comments today and yesterday around the table. My first topic is: Is the Phillips curve alive or dead? My answer is: It looks closer to dead. But a better question might be just about the magnitude of the feedback effects coming from resource utilization to inflation. Those look quite small in figure 1 in the staff memo on this topic. The last point in that chart is based on the past 20 years of data.

This is happening all around the inflation-targeting world. There's a natural explanation for it, which I discussed yesterday and which has both theoretical and empirical support. What is happening is just a simple implication of the fact that the world went to inflation targeting in the '90s. And it's been pretty successful—not perfectly successful, but pretty successful. Cross-

country studies show that inflation variability has declined a lot. Inflation rates tend to hang around their inflation targets quite a bit. So it's all been an improvement over the '60s, '70s, and '80s period, and because of that, when we run our regressions of inflation and resource utilization, we tend to get very little feedback effect. I think it's incumbent on the Committee to accept empirical evidence as it presents itself and make policy in light of that evidence.

One comment yesterday was that the Phillips curve will reassert itself if we wait long enough. But the empirical evidence is that the effects are very weak. So you could wait quite a while before inflation would actually come back to target on the basis of those numbers alone.

This leaves, indeed, inflation expectations as a key variable, which might leave some uncomfortable. But I think it is true that the world thinks and believes that we control the inflation rate over the medium run, and the market-based expectations of inflation are a great barometer of whether they think we're going to hit our target. So, in a lot of ways, it's a way to capture a lot of evidence into one variable. I do prefer the market-based, TIPS, evidence on inflation expectations, which can be adjusted in various ways. I like the TIPS-based evidence exactly because it's very sensitive to market information, which is what we need when we're trying to make monetary policy decisions as we go through each year and go from meeting to meeting. So I like it that those are more sensitive to current information.

I think the staff's tendency to claim that inflation expectations are more or less constant and, therefore, put more weight on what's going on with resource utilization has it backward. Instead, what we should do is accept the evidence that the feedback from the real economy is weak and getting weaker and then look at relatively sensitive movements of inflation expectations to current information about the economy.

We can react to the market's judgment about inflation and about whether we are likely to hit our 2 percent inflation target over relevant horizons, like the next five years, the next two years, or the five-year, five-year forward. So, to me, this is a perfectly fine approach, and, whether we want to do it or not, I think that that will determine our success in the future.

I am worried a little bit about our December rate decision. I don't think the current probability, which is at least 80 percent—and some people have it at 90 percent or 98 percent—reflects the degree of uncertainty about that decision. So I agree with Chair Yellen's comments late yesterday on this issue. I think the problematic part is raising the target rate in circumstances in which inflation is both falling below our target and possibly falling further below our target. I think that's problematic. It may push inflation expectations down further, especially in conjunction with what we might say about 2018.

It may hurt the credibility of our inflation target. To me, the message to markets would be that we don't really care that much about our inflation target, and that we're more anxious just to get interest rates back to a concept of normal. I've argued here many times that we should not have that concept of normal in our heads. We should accept the empirical evidence that we're in a very low inflation environment. We're in a low nominal interest rate environment globally. We still have negative rates overseas in our sister economies. And that situation is unlikely to change any time soon. So our concept of normal should be more or less where we are today—the low interest rate, low inflation regime. And we should not be zealous to raise rates to a normal that is computed on the basis of past data over eras that were not like the one that we're in today.

As I sit here today, my preference is for no December rate move, although I'll certainly keep an open mind about that meeting. One possibility would be to do a dovish hike in

December—that we would raise the policy rate, but we would, at that meeting, have something to say about 2018 through the SEP and through our statement.

I think a key aspect for December is the last two sentences of paragraph 4, and let me just remind you what they are. They're struck out in alternative A for today. These sentences are as follows: "The Committee expects that economic conditions will evolve in a manner that will warrant gradual increases in the federal funds rate; the federal funds rate is likely to remain, for some time, below levels that are expected to prevail in the longer run." And then there's another sentence. One approach would be to strike those out. My feeling is that we now have raised the policy rate somewhat. These sentences were put in there when we were still at zero, so some modification, at a minimum, would be warranted, I think, at the December meeting. If you buy into my regime approach, I would just cross them out totally and say that we've got a funds rate more or less at the level that we want it to be at, and that we'll react to data and we won't prejudge, as these sentences do, that we've got a long way to go before we can get to normal.

Okay. I just wanted to react to three other issues that have come up. There's a lot of talk here about equity market valuations and financial instability. I do think our radar on financial stability is much better than it was in the early or mid-2000s, and I appreciate the staff's work in this area. I think it's good to be thinking about these issues. The issue of fighting excessive equity valuations through monetary policy is a long-standing issue for this Committee, certainly since the "irrational exuberance" speech in the mid-1990s.

I don't have any better answer than what we've said in the past, but I will say two things about this. The financial conditions indexes that we often refer to are informative when they're at stress levels. If they're indicating high stress, they're probably also indicating that the economy isn't doing very well, so I think they're useful in that sense. But when they're low, as

they are today, and not indicating very much stress, it doesn't really imply anything about the future evolution of the economy. That's the empirical evidence on financial conditions indexes. Therefore, I don't think we can read from those indexes an indication that something bad is going to happen. It could, but these aren't really telling us anything about that. So I'd be reluctant to read easy financial conditions as meaning that we have to raise the policy rate.

Also, how efficacious is it to raise the policy rate if you think there's an equity price bubble? I mean, that's been a big issue for us, I think, in the past. Equity prices go up, and they go down, pretty much independently of what this Committee does, so it's maybe harder to tell a story that we're really fighting that bubble through a policy process here. In addition, regarding an issue that was brought up yesterday by several people, is leverage really a problem? If you thought that the equity valuations, like the housing bubble, were somehow associated with excessive leverage, then that seems to have been a much bigger problem than, let's say, the tech bubble in the late 1990s.

On actual inflation, I have just a brief comment here. I have less sympathy than most of you, I think, for the special factors story. I think it's a tough story to tell, and I guess my main issue here is to not just focus on core PCE inflation, but also think about other measures of inflation that would be less susceptible to the influence of special factors. The lead one there, I think, is the Federal Reserve Bank of Dallas trimmed mean series. That series' year-over-year inflation rate has drifted down—not as much as core PCE, but it has drifted down. In fact, CPI has also drifted down. All of the indexes have drifted down. So, really, no matter how you measure it, it looks like something has happened to inflation to move it lower. With the Federal Reserve Bank of Dallas trimmed mean series, outsized movements are excluded, so it maybe gives you a better idea about what's happening with trend movements in inflation. I'd prefer to

switch to the Federal Reserve Bank of Dallas trimmed mean as a preferred measure for this Committee anyway.

Finally, several people talked about fiscal policy, and they talked about other issues such as faster global growth. I think that we could frame a better justification for raising the target rate by talking about the real rate rising globally and saying that we're just trying to keep up with changes in the real safe rate globally. There is some evidence that the global real rate is drifting up. One-year *ex post* Treasury returns are about 84 basis points higher than they were a year ago. So you could make a case that one of the things we're trying to do is just stay with the level of accommodation that we have, but we're doing that by keeping up with increases in the safe rate. That's a global story, in my opinion. It's not just a U.S. story. We would be saying we're rising not because of inflation danger ahead, but because we think the safe real rate is somewhat higher than it otherwise was. That could be supported by faster growth globally, and I think there is some upside risk on this dimension.

Finally, I do support Chair Yellen's compromise solution for paragraph 5 in alternative B today. That would include the red sentence this time and then remove it next time. I think that's a good approach to this issue. And I thank you, Madam Chair.

CHAIR YELLEN. Thank you very much. President Evans.

MR. EVANS. Thank you, Madam Chair. I can support alternative B with the single sentence about the balance sheet in paragraph 5 today. There's no reason to contemplate a rate increase today.

Since September 2016, my SEP submissions have assumed only two increases in the funds rate this year. The data and subsequent analyses have not changed my assessment. I continue to believe that achieving our symmetric 2 percent objective within a reasonable period

would be strongly aided by delaying further rate increases until we have more evidence that inflation is indeed moving back toward target. Let me explain my reasoning.

It sounds to me like many around this table view the drop in core inflation early this year as reflecting just temporary factors. I agree this is quite possible, and if this was our first bout of unexpectedly low inflation this policy cycle, I would be receptive to looking through the recent data in formulating policy. But this is not our first time in this situation. For years, the SEPs have had us reaching our target in another year or two, and for years, this hasn't happened. At times, we've been able to explain our misses with some easily identifiable transitory factor, such as energy pass-through or a higher dollar. But I'm concerned something more persistent is holding down inflation today—namely, I feel we are facing below-target inflation expectations.

Over the past several years, measures of longer-run inflation expectations have moved down notably. Since October 2014, the first paragraph of our policy statements has acknowledged two types of developments with regard to inflation compensation and financial markets—either that compensation had moved down or that it had remained substantially unchanged from the last time but at a low level. Only once, with the rise in 10-year Treasury yields after the election, did we note an increase, but we still had to caution that inflation compensation remained low. Vice Chairman Dudley said yesterday he would worry if these expectations were falling. I agree—I'd worry, too. They're already low, though.

With regard to survey expectations, the statement often refers to them as being stable. Personally, I think this overweights the Survey of Professional Forecasters' 10-year PCE inflation expectations. Remember in high school when you did your math homework and the answers to the odd-numbered questions were in the back of the book? Well, I think everyone in the SPF is reading the Fed's back-of-the-book answer of 2 percent. It did move down one cycle,

when I think somebody had their RA answer the survey for them when they went on vacation [laughter].

But the answer for the CPI is not in the back of the book, and the SPF CPI projections have generally drifted lower and are about 25 basis points below where they were before the recession. The Michigan survey's 5-to-10-year inflation expectations have fallen 50 basis points over that period. When I look at the downward drift in multiple expectations measures, I find it tougher to confidently buy into the idea that inflation today is just temporarily low once again.

Personally, I believe the Committee's communications are partly to blame for this difficult situation. By and large, we are conservative central bankers who view their primary task as preventing an outbreak of 1970s-style inflation. Perhaps, then, it's not surprising that we as a group have not convincingly demonstrated to the public our commitment to a symmetric inflation target. Actual inflation outcomes have been far from symmetric. This experience could easily be confused with a purposeful strategy in which 2 percent is a ceiling. Settling for 1¾ percent reinforces this ceiling theory of an inflation target. Our projections could reinforce this impression as well. For multiple rounds, the SPFs have had inflation gliding up to target from below. It's simply the nature of forecasts that they are typically smooth and typically don't display overshooting.

Since this can look like a ceiling after years of undershooting, our commitment to a symmetric 2 percent inflation objective should be more evident in our public commentary. These comments should deliver a much greater chance of inflation running at 2½ percent in coming years. This issue is especially important now because there's a big strategic risk in failing to get core PCE inflation symmetrically around 2 percent before this economic cycle ends.

When the next downturn comes, monetary policy will likely need to provide substantial accommodation to address falling activity and below-target inflation. In a low-trend-growth and low- r^* environment, a return to the lower bound is very likely. Effective monetary policy actions at the lower bound require that the Committee has substantial credibility for meeting our dual-mandate responsibilities—in particular, for achieving our symmetric 2 percent inflation objective.

I also worry about how financial instability considerations for monetary policy further risk reinforcing that our 2 percent inflation objective is a ceiling. Other tools may be better for addressing financial stability risk so that we can preserve our inflation objective of 2 percent.

If we let that credibility deteriorate toward a public belief that 2 percent is a ceiling for inflation, we could be in for the kind of trouble that the Bank of Japan has faced for so long. So we should be fortifying our efforts now, reinforcing our commitment to symmetry so that future policy actions have the best chance for success in a low- r^* world, and I share the concerns expressed by President Harker earlier.

I think one important way to do this is to delay the next increase in the funds rate target until we have clearer signs of a pickup in inflationary trends. This means not moving today, and if the current weak inflation outlook continues, it probably means waiting until the middle of next year before our next rate hike. This is not what markets are expecting, but I think that it is appropriate policy in response to the data. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Brainard.

MS. BRAINARD. Thank you. I can support alternative B and the proposed approach suggested by the Chair on the final sentence.

With regard to future policy, we've fallen short of our inflation objective consistently over the past five years, and since March, we've seen inflation coming in consistently weaker at a time of diminishing slack. Because the responsiveness of price inflation to diminishing slack has been very weak over many years, I think it's hard to make the case that we should be confident that inflation will rise to target in the medium term.

The conundrum we face is complicated by the combination of the flatness in the Phillips curve and a low neutral rate of interest. Substantial evidence suggests that the equilibrium rate of interest is much lower than it was in the decades before the crisis and it will remain low. In the most recent FOMC Summary of Economic Projections, the median participant expected a longer-run federal funds rate, after subtracting inflation, of $\frac{3}{4}$ percent. That's down sharply from the first projection in January 2012 of $2\frac{1}{4}$ percent, which was more in line with the average value of $2\frac{1}{2}$ percent in the decades before the financial crisis.

A low neutral rate limits the amount of space available for cutting the federal funds rate to offset adverse developments and can be expected to increase the frequency or length of periods when the policy rate is stuck at the lower bound, unemployment is elevated, and inflation is below target. In turn, more frequent or extended periods of low inflation run the risk of pulling down private-sector inflation expectations. In this way, the persistently low level of the neutral federal funds rate may be a factor contributing to the persistent shortfall of U.S. inflation from target. And I do see some evidence of a deterioration in inflation expectations today. In the Michigan survey of households, longer-run inflation expectations have been trending down for some time. Longer-run inflation compensation implied by TIPS is currently 50 basis points lower than its average in the period from 2010 to 2014, and a variety of time-series models put trend inflation notably below 2 percent.

In these circumstances, there's a risk of a downward spiral. Lower average inflation means that average nominal interest rates will be lower still, leading to even less room for maneuver if we experience adverse shocks. While core inflation of, say, 1½ percent, which is the average that we have seen over the past five years, is, in and of itself, not a great cause for concern, settling for a low rate of inflation at a time when the neutral rate of interest has fallen substantially could mean overall policy space is only half as big as it was previously—only 2¼ percent in coming years, well below the 4½ percent level in the decades before the crisis.

This is an uncomfortably narrow buffer compared with previous decades, when the FOMC has slashed the policy rate by over 5 percentage points in the face of recessionary shocks on average. In these circumstances, every five-tenths matter. If our policy rate path isn't informed by this risk today, we raise the likelihood that future members of this Committee will confront the kind of unpalatable choices faced by our colleagues in Japan.

Let me conclude on the question of whether the Committee should soon increase the federal funds rate again. In December of last year, the median participant expected three rate hikes during 2017, under an expectation that core PCE inflation would be running two-tenths below our target for 2017 and unemployment would end the year three-tenths below the natural rate. We hiked in March in the face of one unusual month of data, and we hiked again in June and initiated balance sheet runoff in September, in part reflecting the expectation that the downward shift in inflation would prove idiosyncratic. It's hard to make that argument on the basis of the string of data we have in hand today. Indeed, today's data and the staff's projection suggest that raising the federal funds rate again in December would appear to be out of line with the policy rate path that was anticipated last December.

The staff project that core inflation will be six-tenths below target at the end of 2017, while employment will come in three-tenths below the natural rate as anticipated last December. This means, relative to our projection last December, inflation has come in substantially weaker than expected, whereas labor market slack has come in roughly as expected. And while earlier in the year financial conditions were arguably looser, the recent material appreciation of the dollar, coupled with some increase in the 10-year Treasury yield, have changed that picture.

We have several pieces of data between now and December. If the data confirm today's combination of much weaker-than-expected inflation and slack in line with expectations, this would seem to call for one less rate increase than we anticipated last December. This would help avoid the risk of confirming the downward drift in expectations. If, on the other hand, slack were to take a large step down or inflation were to show signs of accelerating, the original rate path would be defensible. For the time being, I think it counsels a wait-and-see approach as we watch for what the data will tell us between now and our next meeting. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Quarles.

MR. QUARLES. Thank you, Madam Chair. I support alternative B. I support your suggested approach on paragraph 5. I do think that taking it out in December is the right thing. If you leave it in as boilerplate, it will require thinking about whether anything that's happened requires fiddling with that language, and it's best simply to have made clear that it's "turtles all the way down" from December.

I am comfortable with the market's expectations that this body is likely to move in December again. I do think that, in light of the discussions around this table and the briefings by the staff, we have to ask ourselves how hard we're willing to push in order to move inflation a

few tenths of a point if, for some reason, inflation settles to a level that's very slightly below our 2 percent goal. I thought the staff's memo on uncertainty and misperceptions pointed to the risk of pushing too hard on inflation in the context of a flat Phillips curve and volatile and idiosyncratic shocks to inflation, and I think that's a risk that we should take seriously.

All of that said, the advantage of being the new person is that you can wade into disputes that have been settled in the past without any knowledge of their history, and I thought that President Bullard's question yesterday as to why we had an SEP process that basically painted us into a corner for December each year was a sensible question. While I'm comfortable with the corner we painted ourselves into, I do support the idea that perhaps we should look into whether that's a wise practice. Thank you.

CHAIR YELLEN. Good suggestion. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Madam Chair. I support alternative B, and I agree with the compromise proposed on paragraph 5, with the presumption that we will probably likely drop it in December and have a press conference to explain it.

I believe, as we've discussed, we're making good progress in reaching our full employment objective, the U.S. consumer is healthy, business activity continues to strengthen, global growth is stronger than expected in 2017, and the rate of growth expected for this year should be sufficient to continue to remove slack from the economy. Taking into account all of that, I believe cyclical pressures are building as we remove slack from the labor market. However, I believe, as I've said before, these cyclical forces are being at least partially offset by structural forces, particularly an intensifying rate of technology-enabled disruption and, to a lesser extent, globalization. These structural forces are likely limiting the pricing power of businesses and muting inflationary pressures.

From a risk-management point of view, on the other hand, I'm mindful that if we wait too long to see signs of greater inflation, we may well get "behind the curve" and have to play catch-up by increasing rates more rapidly. Historically, this has increased the likelihood of recession. I'm also mindful there's a cost to excessive accommodation in terms of limiting returns to savers as well as creating distortions and imbalances in investing, hiring, and other business decisions. And my comments yesterday were intended to suggest that I think some of these imbalances—for me, at least—are becoming a little more apparent. Monetary policy is not costless. It carries risk.

Lastly, I'm also mindful that the structural forces, particularly slowing workforce growth due to an aging population, will continue to pose challenges for future economic growth, and, as a result, the neutral rate is likely to be much lower than we've historically been accustomed to. Therefore, I do believe that future removals of accommodation need to be done only in a gradual and patient manner.

Reflecting all of these considerations, I intend to keep an open mind about removing accommodation in upcoming FOMC meetings, particularly December. But in the months ahead, I will be continuing to actively assess progress in removing labor slack. And I'll be looking for evidence that these building cyclical forces, reflecting the strength of the economy, have the prospect of offsetting structural headwinds such that we are, in fact, or we can expect to make progress toward meeting our 2 percent inflation objective in the medium term. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Bostic.

MR. BOSTIC. Thank you, Madam Chair. Good morning, everyone. I support alternative B today, including the inclusion of the proposed language of paragraph 5, followed by the removal from the December policy statement coupled with a mention in the press conference.

Looking to the December meeting, I am comfortable continuing on the path of a slow removal of accommodation, should the incoming data unfold in a manner consistent with the outlook I discussed yesterday. However, with every passing inflation report that falls short, I am becoming more and more concerned that expectations may be keeping inflation from reaching our target. Following the first quarter of 2012, the quarter in which the Committee formally announced the 2 percent longer-run target, the year-over-year growth rate in headline inflation has touched the target only once, in the first quarter of this year. In my pre-Fed life, I always thought of the 2 percent inflation target as an objective designed to deliver a price level reasonably close to a 2 percent growth path over the medium term. I still believe this is a good way to think about our inflation objective.

It is striking to consider what the record looks like relative to an implicit 2 percent growth price-level target. If such an objective had been implemented in 2012, we'd currently find ourselves short of the desired price level by more than 4 percentage points. For some context, we might go back to 1993, when the FOMC arguably began operating as if it had an implicit long-run inflation target of about 2 percent. Before the past five years, the largest deviation from any 2 percent price-level path, during that time and before we introduced our inflation target in the first quarter of 2012, was, in absolute value, a little less than 3 percentage points.

I worry about five-plus years of deviating on the low side of our target. Even if one acknowledges that some weakness might have been expected coming out of the Great Recession, the path has not changed appreciably as we have approached full employment. I worry about

increasingly deviating from the underlying price-level path that I think is a good metric for whether we are successful in meeting our longer-term price-stability objective.

Yesterday I noted I'm still forecasting movement toward target as temporary effects of inflation dissipate. But, like President Harker, President Evans, and Governor Brainard, I am concerned that we risk expectations becoming anchored below 2 percent if that forecast does not materialize.

Although Governor Fischer is no longer with us on the Committee, it seems several of us, myself included, are taking up his mantle and playing "Stan for a Day." We've noted in the past that surveys and discussions with directors and business contacts suggest a large portion of the public believes 2 percent is a ceiling. If we were to express our inflation target as the center of a range, with perhaps a ½ percentage point tolerance on either side of that midpoint, perhaps that would reinforce the idea that our tolerance for misses really is symmetric.

Now, I realize that changing our objective to a target range is probably not in the cards at present, nor is the idea of a more explicit price-level objective, although President Evans, President Williams, and others have usefully joined in such a discussion in the past. But I think it would be useful at some point to revisit how we formulate and communicate our objective, especially if evidence accumulates that inflation expectations have slipped away from us. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President George.

MS. GEORGE. Thank you, Madam Chair. With an economy growing above trend, low unemployment, and stable prices, a more neutral stance of monetary policy is warranted. Following the balance sheet normalization action in September, I support alternative B, as it leaves open the door for the Committee to consider a move in December and can be viewed as

consistent with the gradual approach emphasized in our communications, so long as economic conditions evolve in line with expectations.

Although my policy rate path may differ, I, too, am mindful of the challenges we face in our narrative concerning low inflation readings and the longer-run 2 percent inflation target, which we chose in 2012 as a proxy for price stability. However, in the context of the economy's ongoing performance and what I see as our ultimate objective, which is to promote maximum employment and price stability in a sustainable manner, I'm wary of fine-tuning our interest rate policy to achieve and maintain precise numerical objectives for inflation and employment.

We've identified these numerical targets as longer-run benchmarks, and deviations from them, such as we see today, are to be expected. When we're fortunate enough to be in a situation in which we're substantively achieving our dual-mandate objectives, monetary policy should be a neutral influence on the economy. Yet the current funds rate target is well below the median SEP estimate of its longer-run value, thereby providing undue accommodation. Nearly all of our benchmark policy rules echo this. Accordingly, we should continue a gradual removal of this accommodation.

In the medium term, we need to weigh deviations from our inflation objective against deviations from our employment objective. In the current context, the shortfall of inflation below 2 percent should be weighed against the decline of unemployment below our estimate of the longer-run normal unemployment rate. Low inflation judged in the context of an economy operating at or beyond full employment and growing above trend should not cause us to unconditionally recalibrate our policy rate path.

It seems to me that our current challenge is to communicate a course for monetary policy that balances the undershooting of the unemployment rate against these lower inflation readings.

With the unemployment rate falling below SEP estimates of the longer-run unemployment rate, I'd like to see the Committee recalibrate its communication regarding the aims of the current stance of policy. Since September 2016, paragraph 3 of our statement has noted that the stance of policy remains accommodative to support some further strengthening in labor market conditions, in addition to supporting a return to 2 percent inflation. Movements in inflation and the unemployment rate this year have been noncomplementary with respect to our longer-run objectives. The Committee should, I think, follow a balanced approach in promoting its goals as described in our Statement on Longer-Run Goals and Monetary Policy Strategy.

In this respect, I think that, as soon as our next meeting, the current language in the statement may need to be refreshed in order to describe progress toward our goals more accurately. To this end, I might suggest that the sentence that says “the stance of monetary policy remains accommodative” should not focus on further strengthening in the labor market, but instead simply note that it is supporting a sustained return to 2 percent inflation at a time when the unemployment rate is running below its estimated longer-run level.

Along these lines, I found the Board staff's memo on the uncertainty and misperceptions for monetary policy to be informative, and its assessment underlies my concern with the statement language in paragraph 3. Because of the unresponsiveness of inflation to economic slack or the lack thereof, it may be the case that it would take an extreme overheating of the economy to generate a more rapid move of inflation back to 2 percent. Such an overheating would likely cause further resource misallocation, threaten financial stability, and ultimately could hand us an undesirable increase in inflation or hasten the next recession.

Finally, Madam Chair, I support your paragraph 5 approach—leaving it in at this meeting and thinking about it at the next one.

CHAIR YELLEN. Thank you very much. Acting President Mullinix.

MR. MULLINIX. Good morning, and thank you, Madam Chair. My outlook for appropriate policy has not changed materially since we last met. Further tightening in labor markets, together with relatively stable inflation, suggests that the funds rate should rise. Of course, the stability of inflation is open to interpretation. But for now, I continue to believe that we should “look through” the modest deviations of inflation from target, as these deviations are likely a result of idiosyncratic and transitory shocks.

Even though in the current situation I recommend that we respond primarily to the signals coming from the labor market and not from realized inflation, I would characterize my approach as “balanced,” using the terminology of the staff memo on uncertainty and monetary policy. The important role of the labor market in driving my thinking about policy does not mean that we ought to ignore inflation in setting policy. Rather, it reflects my interpretation that the current behavior of inflation is consistent with achieving our inflation target. As I said, I perceive recent deviations to be modest, idiosyncratic, and transitory.

As long as inflation is on target, our policy rate needs to vary with real economic activity. If I were to become convinced that inflation had persistently declined well below our target, then that would be a concern in and of itself regardless of labor market conditions. In such circumstances, it would be appropriate to respond to the behavior of observed inflation.

For now, I’m comfortable with alternative B, although I do think the appropriate level of the funds rate is higher than its current range. I do not think that waiting until December to make our next move creates material risk. Madam Chair, additionally, I support your proposed wording change in paragraph 5 for this meeting. I also support its removal from the December

statement, concurrent with the Chair's acknowledgment of as much in the press conference.

Thank you.

CHAIR YELLEN. Thank you. Governor Powell.

MR. POWELL. Thank you, Madam Chair. I will support alternative B as written, including with respect to your proposed language for paragraph 5.

If the economy performs in line with the Tealbook baseline, I would see a further rate increase as likely to be appropriate in December. More generally, I continue to see a gradual removal of accommodation through rate increases and a shrinking balance sheet as the appropriate path to balance the different potential tradeoffs that we face and to extend the ongoing expansion.

Growth is clearly above trend, which implies a tightening labor market and declining unemployment. On this path, it seems very likely that unemployment will fall well below 4 percent and remain there for an extended time—something we've not seen since a four-month period in the year 2000 and, before that, a four-year period beginning in February 1966, more than 50 years ago. In fact, that is the Tealbook forecast and my September SEP forecast as well. The flat Phillips curve essentially calls for this sustained undershooting of the natural rate of unemployment to push inflation up to our 2 percent medium-term objective.

The SEP path is a gradual one, with about six rate increases between now and the end of 2019. While there are risks to this strategy, the risks to tightening materially faster or slower seem greater. On the one hand, postponing any further tightening until we have clearer evidence that inflation is moving to 2 percent would put even greater pressure on resource constraints and entail several risks. Although we see little evidence of this now, inflation pressures may be building, or inflation may prove to be more sensitive to slack as we move below the sustainable

level of unemployment. While we would react to that outcome with tighter policy, getting “behind the curve” would require a more rapid tightening and risk a downturn. In addition, putting too much pressure on resource constraints may undermine financial stability over time, although the evidence on that is not clear and, in any case, does not show that we are at that point today.

On the other hand, a faster pace of tightening would increase the risk of persistent below-target inflation, which would leave us that much closer to the effective lower bound. While my view is that inflation is likely to return to 2 percent if the economy performs roughly as expected with our extended undershoot, inflation risks do appear to be skewed to the downside.

I would also point out that the potential benefits of our current “patient but not too patient” strategy could be significant, particularly at a time when the extent of the supply-side damage left behind by the crisis remains uncertain. Specific gains could include higher wages, higher labor force participation, and increased investment as the relative price of labor rises, all of which I would regard as welcome.

So while managing these tradeoffs will be difficult, for now, I continue to believe that the Committee’s path of gradual tightening is about right, and that an increase in December is likely to be appropriate. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kashkari.

MR. KASHKARI. Thank you, Madam Chair. I support alternative B, and I support your proposal regarding the language in paragraph 5. My comments are going to focus on the future path of policy.

We’ve decided that we have a symmetric target rather than a ceiling. We’ve been below target virtually the entire time that we’ve had a target, averaging 1.3 percent. Inflation and

inflation expectations are either falling or stable. They're certainly not climbing. We have very powerful tools to keep inflation from climbing too high, yet we have very limited tools to raise inflation. And we've been repeatedly and continuously surprised that a lot more people wanted to work than we thought. To me, this is as close to a free lunch as it gets in monetary policy.

Now, I give a lot of town halls around my District, and when I explain the logic of why I've opposed tightening, usually the toughest question I get is, "Well, what you said makes sense. So, what is everybody else looking at?" [Laughter] So I then walk through the arguments, and I say, "The first argument is, there's some nonlinearity in the inflation process." I call this a ghost story because, in my view, it collapses under scrutiny. There's literally no evidence for this nonlinearity, but I admit that it can't be completely ruled out.

With my staff, I've gone back and examined the 1960s and '70s in as much detail as we could, and we found no evidence of this ghostly nonlinearity. That time provides evidence of what happens when the political independence of the Federal Reserve is compromised over a number of years, leading to an unanchoring of inflation expectations, and I believe very strongly that no one around this table will allow that to happen. So I'm not concerned about that. Furthermore, it seems implausible to me that inflation expectations could suddenly unanchor to the upside while they're simultaneously falling.

Second, regarding the financial stability concerns that we talked about, I thought Governor Brainard did an excellent job yesterday of walking through this. We just had an extensive briefing the staff gave on the issue—maturity transformation does not appear to be accelerating. But even if it were, is the Board going to raise the countercyclical capital buffer? I thought we all agreed that that was the first line of defense. So why skip that and jump to interest rates?

Third, some have argued that easy financial conditions suggest that we haven't actually tightened policy. I don't find this compelling. As we've lowered our own r^* estimates, so have the markets, and that can explain a lot of the asset price moves that we've seen. And I think we need to remind ourselves that there are real costs for our premature tightening of policy. If we accept the conventional view of how monetary policy affects the economy, we must acknowledge that economic growth, job growth, wages, and inflation are all lower than they otherwise would have been had we not tightened policy. That must be true. And I believe our actions are what are driving inflation expectations lower, which directly compromises our ability to deal with a future downturn by limiting how low we can drive real rates.

For these reasons, I don't think we should raise the federal funds rate until core PCE inflation actually hits 2 percent on a 12-month basis, unless we see some sustained increase in inflation expectations or a large drop in the unemployment rate, giving us some confidence that labor market slack has actually been used up.

I just want to mention one thing. President Williams brought up the point about the inverted yield curve in the staff's forecast. I noticed that as well. In fact, as long as I've been on the Committee, I think the staff baseline has had an inverted yield curve a few years out. But this time, it's four years of an inverted yield curve, a feature that I found very interesting. And, as I looked at the scenario, I thought to myself, "If this is what actually happened—if we had a four-year inverted yield curve—I'm pretty sure we'd be in a recession even though the staff isn't forecasting that." But inflation peaks at 2.1 percent. So in the staff baseline forecast, we drive up interest rates to try to get the unemployment rate higher, causing a deep recession even though the staff isn't forecasting that. But the inverted yield curve for four years—I think we'd have a recession. But inflation never crosses 2.1 percent. We'd have a heck of a time explaining

that to the American people if we actually did this to the economy. So when I look at statements like, “Oh, well, history shows that an inverted yield curve means a recession is coming,” my reaction is that I think that’s speaking as much about the Committee’s actions as it is about anything else. That’s in our control. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you, Madam Chair. I think we’re a long way from inverting the yield curve. Just for the record.

MR. KASHKARI. It’s in the baseline.

VICE CHAIRMAN DUDLEY. Just for the record. And the Committee is going to spend a lot of time to reflect on what future path of short-term rates is appropriate with that in mind.

I favor alternative B. On language, I’m comfortable with the Chair’s suggestion to include the balance sheet sentence in paragraph 5 this time, with the understanding that we drop it at the next meeting. I think its ongoing inclusion would be a mistake, because it could be misconstrued as implying a greater likelihood that we might adjust our balance sheet strategy than actually seems probable. So I think it really does have to come out relatively soon.

With respect to our balance sheet normalization process, I guess I would sum it up as “so far, so good.” With respect to people that I’ve been talking to, we’re getting high marks for both communication and design. The effect on the Treasury security and agency MBS markets has been very hard to discern, if there is one at all. Ten-year Treasury note yields have risen about 20 basis points since our previous meeting, but this appears due to evidence of the stronger economy and an upward shift in expectations about the likelihood of a tax cut package, not due

to the balance sheet. Agency MBS spreads, in contrast, have actually narrowed rather than widened, so there's no evidence that there's much effect there, either.

As we look forward, market expectations remain very much on the side that we will raise our federal funds rate target 25 basis points in December. I think that's what I'm going to favor at the next meeting, assuming that the outlook continues to evolve in line with my expectations. While it's true that inflation continues to undershoot our 2 percent objective, I think we also have to put weight on the strength of the economy, the tightness of the labor market, and the fact that financial conditions remain very easy. Financial conditions haven't really moved much since the previous meeting, but they're still at a very accommodative setting. If we were not to tighten when the market broadly expected it, I think that financial conditions would likely ease further. That, to me, would not be desirable. I think the fact that there's evidence that inflation compensation is increasing is also noteworthy. If that wasn't happening, then I'd be more inclined to be more patient.

Finally, I think it's important that the starting point matters. If we raise the federal funds rate target range 25 basis points, we're still going to be below 1½ percent. That almost certainly is still an accommodative monetary policy setting. If you had asked me a few years ago, at a 4.2 percent unemployment rate, where the federal funds rate would be, I would not have picked where we are today.

To sum up: Shifting the stance of monetary policy slightly in the direction of less accommodation seems appropriate even with inflation slightly below our objective, as we are near full employment. The outlook is that above-trend growth is likely to continue, supported by easy financial market conditions; and a tightening in monetary policy in December is already broadly expected.

Finally, I'd like to close with a few words of thanks to Brian Madigan. Brian has been an extremely dedicated and capable central banker for many years. I think we all recognize that and respect it. I think, Madam Chair, you said it very well in your remarks yesterday. But I have to say, my own experience, I think, goes beyond that of many others around the table. During the financial crisis, Brian and I were partners, as Brian headed the Board's Division of Monetary Affairs and I headed the Markets Group in New York.

There are many things that Brian did a lot better than I did, and I leaned a lot on him during that period. In particular, Brian was extraordinarily patient with me as he helped me get up to speed in learning all of the intricacies of Federal Reserve governance and communication, such as when I asked him, "So when we send a memo to the FOMC, what do we actually include in that memo?"

He was also extraordinarily hard working—and probably too much so, in fact. I remember that, in the fall of 2008, when I called Brian's office, it was before six o'clock in the morning, and my intention was to leave him a voice mail about some late-breaking development with respect to our nascent FX swaps network. Much to my surprise, Brian picked up the phone, and we started to talk—my call didn't go to voice mail. He was a great person to partner with through some very difficult times, and I want to thank you for that.

At a time when many people are focused on the potential transition of leadership at the Fed, I think we should also focus instead on all of the talented people we have at the Board and at the Reserve Banks, such as Brian, who do the work that makes it all look good.

MR. MADIGAN. Thank you very much.

CHAIR YELLEN. Thank you. Well, thank you for a very interesting and thoughtful round of comments. I think our decision in December may not be so easy, but fortunately, for

today, I think things are pretty straightforward. I've heard broad-based support for alt-B with the inclusion of the red sentence in paragraph 5 for today, with a presumption that we will drop it in December. Let me ask Brian to review what we're going to vote on and then read the roll.

Then, following that vote, the Board will vote on reserves and discount rates.

MR. MADIGAN. Thank you, Madam Chair. As you indicated, this vote will be on the monetary policy statement for alternative B as shown on pages 6 and 7 of Thomas Laubach's briefing materials, with the inclusion of the currently bracketed sentence in paragraph 5. It will also encompass the directive to the Desk as included in the draft implementation note on pages 10 and 11 of those briefing materials.

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

Thank you.

CHAIR YELLEN. Okay. Now the Board needs to vote on 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. POWELL. So moved.

CHAIR YELLEN. Thank you. 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 October 27 memo to the Board. Do I have a motion?

MR. POWELL. So moved.

CHAIR YELLEN. Thank you. Without objection. And, finally, let me confirm that our next meeting will be held on Tuesday and Wednesday, December 12 and 13.

END OF MEETING