Meeting of the Federal Open Market Committee on December 12–13, 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, December 12, 2017, at 1:00 p.m. and continued on Wednesday, December 13, 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, Michael Strine, and John C. Williams, Alternate Members of the Federal Open Market Committee

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

James A. Clouse, 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

Thomas A. Connors, Michael Dotsey, Eric M. Engen, Evan F. Koenig, Daniel G. Sullivan, William Wascher, and Beth Anne Wilson, 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; Andreas Lehnert, Director, Division of Financial Stability, Board of Governors

Jennifer Burns, Deputy Director, Division of Supervision and Regulation, Board of Governors; Rochelle M. Edge and Stephen A. Meyer, Deputy Directors, Division of Monetary Affairs, Board of Governors; Michael T. Kiley, Deputy Director, Division of Financial Stability, Board of Governors

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

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

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

Antulio N. Bomfim, Edward Nelson, Ellen E. Meade, and Robert J. Tetlow, Senior Advisers, Division of Monetary Affairs, Board of Governors

Shaghil Ahmed, Associate Director, Division of International Finance, Board of Governors; Elizabeth Kiser, John J. Stevens, and Stacey Tevlin, Associate Directors, Division of Research and Statistics, Board of Governors; David López-Salido, Associate Director, Division of Monetary Affairs, Board of Governors

Norman J. Morin and Shane M. Sherlund, Assistant Directors, Division of Research and Statistics, Board of Governors
Eric C. Engstrom, Adviser, Division of Monetary Affairs, and Adviser, Division of Research and Statistics, 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

Cynthia L. Doniger, Senior Economist, Division of Monetary Affairs, Board of Governors

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

Kelly J. Dubbert, First Vice President, Federal Reserve Bank of Kansas City

[1] Attended through the discussion of developments in financial markets and open market operations.
[2] Attended Tuesday session only.

David Altig, Kartik B. Athreya, Mary Daly, Beverly Hirtle, Geoffrey Tootell, and Christopher J. Waller, Executive Vice Presidents, Federal Reserve Banks of Atlanta, Richmond, San Francisco, New York, Boston, and St. Louis, respectively

Todd E. Clark and Marc Giannoni, Senior Vice Presidents, Federal Reserve Banks of Cleveland and Dallas, respectively

Jonathan L. Willis, Vice President, Federal Reserve Bank of Kansas City

Benjamin Malin, Senior Research Economist, Federal Reserve Bank of Minneapolis

Transcript of the Federal Open Market Committee Meeting on December 12–13, 2017

December 12 Session

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

MR. QUARLES. So moved.

CHAIR YELLEN. Thank you. Without objection. And, as you know, the Federal Reserve Bank of Richmond has announced the appointment of Tom Barkin as president of the Federal Reserve Bank of Richmond beginning January 1. We look forward to our new colleague joining the Committee at the January meeting. Mark Mullinix will be representing the Richmond Bank again today. And, Mark, I want to thank you for so ably representing Richmond during these past five meetings. We are very grateful for your contributions.

MR. MULLINIX. Thank you.

CHAIR YELLEN. As you recall, we elected Jim Clouse as FOMC secretary, effective November 26, and this is his first meeting serving in that capacity. So welcome, Jim. And, finally, I would like to remind you that this evening we will have a chance to honor former Board Vice Chairman Stanley Fischer at a reception downstairs. All FOMC participants and all staff attending this meeting are invited to attend the reception. Due to scheduling constraints, the reception needs to begin in a timely way, so we plan to adjourn for the day no later than 5:00 p.m.

Okay. With that, let's turn to the formal agenda, and let me call on Simon to begin with the Desk presentation.

MR. POTTER.[1] Thank you, Madam Chair. Over the intermeeting period, expectations that there would be a rate increase at this meeting further solidified, with

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

the market currently pricing in a very high probability of a 25 basis point move. The market price-implied expectation was echoed in the Desk policy surveys, with all respondents anticipating an increase at this meeting. As can be seen in the top-left panel of your first exhibit, both the current market-implied path, the dark blue line, and survey respondents' probability-weighted expectations of the target rate over the near term, the dark blue diamonds, shifted modestly higher, as ongoing strength in economic data served to reinforce expectations of a gradual withdrawal of accommodation. FOMC communications were perceived as generally consistent with those over the previous period and were not cited as driving significant price action. In our surveys, the median responses indicate that no change in the SEP median funds rate path is expected, but many respondents did point to some upside risk to these expectations in the case of the overall dot plot.

In terms of developments next year, markets are, as shown in the top-right panel, currently pricing in about 15 basis points of additional tightening by the March meeting and nearly 50 basis points of tightening by 2018's year-end. Market commentary does not appear to reflect expectations of any material change in the FOMC's reaction function as a result of the proposed future changes to the Committee's composition.

Over the period, developments concerning fiscal policy were a major point of market focus, as the House and Senate have moved tax plans through their respective chambers. Passage of a reconciled measure is viewed as likely by year-end. Market participants widely discussed the potential economic and market effects of a tax bill, and while most view it as providing further support to equity prices, many also appear to expect it to have a relatively small effect on the economic growth outlook.

Respondents to the Desk's surveys noted that the higher probability of passage was a prominent factor behind the increase in their forecasts for the federal fiscal deficit. As shown in the middle-left panel, the median forecast of the deficit's share of GDP rose to 4 percent for fiscal year 2019 and 4.3 percent for fiscal-year 2020, a 30 basis point and 48 basis point increase over the previous surveys, respectively. That said, forecasts for 2019 were generally around the levels earlier this year and the dispersion of views remains high, especially for 2020. Expectations of an increase in the deficit, combined with the view that future Treasury debt issuance will be concentrated at shorter-tenor points on the curve—partly as a result of the November 1 recommendation by the TBAC—were widely cited as contributing to the 20 basis point increase in two-year Treasury yields and the related flattening of the Treasury yield curve over the period.

This narrowing in the spread between long- and short-maturity Treasury yields—part of an ongoing curve-flattening trend observed over recent years—received significant market attention over the intermeeting period. As part of the staff analysis of this trend, respondents to the Desk's surveys were asked to decompose the 100 basis point narrowing in the spread between the 2-year and 30-year yields since the current hiking cycle began in December 2015. The middle-right panel shows that, on average, respondents attributed 69 basis points of the narrowing to an increase in

market expectations regarding the 2-year average effective federal funds rate and 26 basis points to a decline in the 30-year nominal term premium. We also asked about the importance of various economic and market factors in explaining the spread narrowing. However, respondents attached similar, moderate weights to factors such as changes in the economic outlook, changes to Treasury debt supply and issuance patterns, and spillovers coming from foreign monetary policy. In his briefing, Thomas will further discuss the narrowing of the spread and its possible implications.

Beyond the rise in shorter-dated interest rates, broader financial conditions are substantially easier than at the beginning of this hiking cycle, as shown in the first column of the bottom-left panel. Over the intermeeting period, financial conditions were relatively little changed, except for an increase in equity prices that market participants largely attributed to the earnings implications of the tax legislation. Consistent with this interpretation, the share prices of high-tax firms notably outperformed. The broad U.S. dollar index depreciated roughly ½ percent. Although the dollar move was modest on net, it received a fair amount of attention, as it occurred against the backdrop of rising short-term U.S. interest rates and increasing likelihood of the tax bill's passage.

Earlier in the period, markets quickly shrugged off a brief episode of volatility, which saw declines of several percent in global equity prices and widening spreads on U.S. high-yield and emerging market debt. Contacts cited a number of factors contributing to the cross-asset volatility—among them, heightened uncertainty over tax reform in the United States and below-expectations Chinese economic data outcomes; however, declines in these markets have mostly been retraced. One interpretation of this resilience has been market participants' underlying confidence in improving global fundamentals amid continued accommodative monetary policy across major central banks. A more cautious interpretation might be that this episode reflects, and reinforces, a prevailing "buy the dip" mentality, regardless of possible underlying risks. The exceptional volatility and rapid price appreciation of bitcoin—on which futures contracts were launched this past weekend—provides a vivid example of exuberance and risk-seeking behavior.

Finally, one potential source of ongoing risk that market participants remain focused on is how Chinese policymakers rein in the excessive accumulation of debt that has occurred in the post-crisis period. Efforts to reduce financial-sector leverage have resumed following the 19th National Party Congress in October, as officials have further underscored their commitment to addressing financial-sector risks, particularly in the shadow banking sector. Market contacts have pointed to increases in market interest rates and increased volatility in equity markets as related to these efforts. As indicated in your bottom-right panel, Chinese government bond yields, shown in red, have risen to around 4 percent. An important source of stability in the Chinese financial system has been the exchange value of the RMB, which has been little changed amid a benign dollar backdrop and more balanced capital flows. However, for the period ahead, uncertainty remains over how policymakers will achieve a sustained slowdown in the growth of credit to nonfinancial borrowers amid

a likely slowing of the economic growth trajectory. Shaghil will discuss financial risk in China in his briefing. I will now turn the briefing over to Lorie.

MS. LOGAN. Thank you. I will begin on your second exhibit with a discussion of money market developments and then turn to updates on reinvestments, reference rates, and operational readiness.

As you can see in the top-left panel, the effective federal funds rate and overnight bank funding rate continued to "print" at 1.16 percent throughout the intermeeting period with the exception of month-end.

Meanwhile, as shown in the top-right panel, overnight RRP take-up fell, reaching $21 billion in mid-November—its lowest level since May 2016. Excluding month- and quarter-ends, take-up averaged $54 billion, $80 billion less than over the previous period. Market participants have pointed to readily available alternative investments offering more attractive rates as the main driver of the decline in take-up. Specifically, Desk contacts consistently cited increased private-sector repo supply as a key contributing factor. Indeed, as shown in the middle-left panel, overnight repo volumes for OMO-eligible collateral have increased roughly $50 billion since October and about $375 billion year-to-date.

Dealers have suggested several complementary factors for the increased repo borrowing. These include a better understanding of the implications of post-crisis regulatory requirements for capital and liquidity, more willingness by dealers to accommodate increased demand for repo lending following money fund reform, and higher net inventories to be financed due to increased Treasury debt issuance in 2017.

Relatedly, increases in Treasury bill supply and rates also reportedly contributed to lower overnight RRP take-up. As shown in the middle-right panel, net bill issuance had risen by about $120 billion before falling back a bit ahead of the debt ceiling reinstatement. Market participants anticipate that bill supply could continue to increase in 2018 due to potential changes in the Treasury's debt management strategy and increases in fiscal deficits. Market participants expect bill supply to start rebounding this week, as the Treasury can employ extraordinary measures to create additional borrowing capacity and remain under the statutory debt limit for some time. And they generally believe that the debt limit will not become binding until March or April.

Despite the earlier decline, market participants expect overnight RRP take-up to increase as usual heading into year-end. More broadly, they generally anticipate typical dynamics over year-end, with some temporary changes in dollar funding costs expected in both domestic money markets and short-term funding markets abroad. As evidence of this, the premium provided for one- and three-month dollar funding in the FX swap market over one- and three-month dollar LIBOR increased modestly as year-end rolled into the relevant windows. However, contacts have indicated an expectation for less acute increases in FX swap-implied bases this year-end compared with year-end last year due in part to greater prefunding, as well as improved bank

liquidity management and reduced demand for dollar funding, especially on the part of Japanese firms. Consequently, usage of the dollar liquidity swap lines could increase modestly as usual over year-end, though likely to a lesser extent than last year.

With regard to the SOMA portfolio, the Desk continues to reinvest receipts of Treasury and agency security principal in excess of the Committee's announced redemption caps. As directed, $18 billion in Treasury securities and $12 billion in agency securities will mature or pay down without reinvestment in the October-through-December purchase periods.

However, due to some features of agency mortgage-backed securities and the settlement date-based accounting approach used by the Federal Reserve, declines in outright holdings of MBS that result from the caps are not yet apparent to the public in the H.4.1 statistical release. This is due to a mismatch between the time when monthly principal payments are received and the time when corresponding reinvestment purchases settle. Due to the complexity of this topic and questions we've received from the public, we plan to update the FAQs on our website soon and provide a clarification on the cycle of the MBS cash flows.

Furthermore, as discussed in previous briefings, there will likely be a marginal deviation from the targeted MBS purchase amount implied by the caps. This is due to operational constraints, such as our operating system's minimum $1 million trading increment and because actual paydowns can vary from the estimated paydowns reported by the mortgage agencies. As a result of these two factors, the Desk reinvested roughly $2 million more than the targeted amount for the October purchase period and $11 million more than the targeted amount for the November purchase period. In other words, the amount of MBS rolling off the balance sheet will be $13 million less than the exact amount implied by the caps for these two periods.

Looking ahead, the Desk's surveys asked about expectations regarding the size and composition of the Federal Reserve balance sheet, on average, in 2025, conditional on not moving to the effective lower bound between now and then. As illustrated in the bottom-left panel, the median respondent expects assets to average about $3.6 trillion, with the interquartile range of responses running from $3.1 trillion to $3.8 trillion. This represents a roughly $300 billion increase in the median and a modest narrowing in the interquartile range since the question was last asked ahead of the June FOMC meeting.

With respect to the liability side of the balance sheet, as shown by the red diamonds in the bottom-right panel, the median respondent now expects a somewhat higher level of currency outstanding on average in 2025. At $2.2 trillion, this implies an average annual growth rate of roughly 5 percent—slightly lower than the approximately 7 percent growth rate seen over the past decade. Median expectations regarding most other liability categories, including reserve balances, were little changed from June. Though it is not shown in the chart, nearly all respondents expect the Committee will still use RRPs in some form in 2025.

The Desk will use these updated expectations, along with the December interest rate forecasts in the surveys, as inputs to projections in the upcoming annual report on open market operations, which will be released to the public in early Q2. The top-left panel of your next exhibit shows the preliminary results for projected SOMA holdings under alternative liabilities scenarios. As you can see, the contours of the projections are similar to those in the midyear update to the 2016 annual report. Under the path implied by the median December survey results, shown by the solid red line, the portfolio normalizes in 2021, slightly earlier and at a slightly larger size than implied by the median June survey results, shown by the dashed red line. The projected size of domestic securities holdings under smaller and larger liabilities scenarios are now closer to the median than they had been in June.

Your final panel provides an update on reference rates. Recall that the Federal Reserve staff are working to produce and publish three new reference rates based on overnight Treasury repo transactions, in cooperation with the Treasury Department's Office of Financial Research. In late August, a *Federal Register* notice was issued by the Federal Reserve Board requesting public comment on the planned construction and production of the three new rates. The 60-day comment period concluded in October. We collected 12 responses, which were summarized and addressed publicly in a final notice published by the Board on Friday. In response to comments received, we now plan to publish the rates at around 8:00 a.m. rather than 8:30 a.m. eastern time. Initial publication of the rates is on track for the second quarter of 2018.

With respect to the effective federal funds and overnight bank funding rates, the Federal Reserve Bank of New York plans to release a Statement of Compliance of the rates with the IOSCO Principles for Financial Benchmarks by early next year. For context, the IOSCO principles represent a set of international best practices for all aspects of benchmark administration, which have been endorsed by the Financial Stability Board. The purpose of releasing such a statement is to increase transparency surrounding our administration of these rates. We intend to update this statement shortly after the initial publication of the three overnight Treasury repo rates.

Finally, in your appendix you'll find a short update pertaining to a memo that we recently circulated providing an overview of the Desk's operational readiness framework. This work also determines our small value operational test plan, which we will present at the January meeting. Relatedly, the usual summary of the small value exercises conducted over the intermeeting period is also shown in the appendix. Through these efforts over the course of the year, we have identified and addressed a number of opportunities for enhancing both our operational robustness and the readiness of our counterparties.

Thank you, Madam Chair. We would be happy to take questions.

CHAIR YELLEN. Thank you. Questions for Simon or Lorie? President George.

MS. GEORGE. Lorie, on exhibit 2, chart 12, would you explain to me again, what is significant about the difference between the June and the December surveys? What do you think drove the view on Federal Reserve notes?

MS. LOGAN. I don't think—there wasn't anything that we received in the surveys themselves that explained that change. I think it just might be further "socialization." As they have seen other forecasts of these, they may have adjusted their own. But I don't think there is any larger theme.

MS. GEORGE. Okay—there's nothing to read into that?

MS. LOGAN. I don't think so.

MS. GEORGE. Thank you.

CHAIR YELLEN. Any other questions? [No response] Okay. Seeing none, we now need a vote to ratify the domestic open market operations conducted since the October–November meeting. Do I have a motion to approve?

VICE CHAIRMAN DUDLEY. So moved.

CHAIR YELLEN. Thank you. All in favor? [Chorus of ayes] I'm assuming none are opposed. And let's then go to our economic briefings, and I'd like to call on John Stevens to start us off.

MR. STEVENS.[2] Thank you, Madam Chair. I'll be referring to the handout titled "Material for Staff Presentation on the Economic and Financial Situation."

Last Friday's employment report was very close to our expectations. In particular, as shown in panel 1, the unemployment rate held steady at 4.1 percent in November, as we had projected, and the labor force participation rate remained at 62.7 percent, just a bit less than we had anticipated. As noted in the panel to the right, the BLS estimates that payroll employment rose 228,000 in November, in line with our expectations. The three-month change, which should be largely unaffected by the

[2] The materials used by Messrs. Stevens and Ahmed are appended to this transcript (appendix 2).

hurricanes, averaged 170,000, a pace we view as consistent with further tightening in labor utilization.

Because labor market developments are so important to your conduct of monetary policy, we have been engaged in a project over the past couple of years to work with ADP's weekly payroll data to construct a timely indicator of private payroll employment that is complementary to the measure published by the BLS. I should note that our new indicator is distinct from ADP's own *National Employment Report*. The latter aims to predict the BLS payroll number a few days in advance, whereas the primary objective of our indicator is much more ambitious—namely, to sharpen our assessment of the true state of the jobs market by bringing to bear the additional information collected by ADP. The role for such work is illustrated by the fact that even the BLS measure, notwithstanding all of its statistical and methodological rigor, has a 90 percent confidence interval of plus or minus 111,000 arising from sampling error alone.

Our basic approach is to develop an estimate of the monthly change in payroll employment given in the ADP data (shown in panel 3 in black) and then use a Kalman filter to combine that series with the BLS measure (shown in red). The resulting series (in blue) provides a signal about the underlying pace of employment changes. In particular, the faster increases in the ADP measure over the past two years suggest that the underlying pace of employment increases may have been a little stronger than indicated by the BLS measure over that period. As noted in a box in the Tealbook, the ADP series has some favorable characteristics. For one thing, it covers employment throughout the month rather than just the pay period that includes the 12th day of the month, and thus it should be useful for gauging the employment effects of events such as storms that happen outside the BLS-relevant pay periods. Overall, the early results coming from this project strike us as quite promising. They represent just one piece of what we anticipate will be a much broader effort to harness nontraditional sources of information in order to sharpen our inference regarding the current state of the economy.

Panel 4 summarizes selected results of inquiries made to Beige Book contacts that were conducted by the staffs at the Reserve Banks. Among other things, contacts were asked about their hiring plans over the next 12 months, their use of changes in wages and salaries to attract or retain employees, and challenges in hiring workers to fill open positions. Averaging across the Reserve Banks, 54 percent of respondents reported plans to increase employment over the next 12 months, somewhat more than a year ago. Among firms that planned to increase employment, 30 percent planned to raise starting pay in most job categories, and 45 percent planned to do so for selected categories. Finally, nearly half of all firms indicated that their hiring plans have been restrained by difficulties finding workers with the required skills. This figure is a little higher than in the past couple of years, and it is up significantly from about 15 to 30 percent of firms in the 2011–14 time frame (not shown).

Panel 5 provides an update on unemployment rates by racial and ethnic groups. On a three-month moving average basis, unemployment rates were generally little

changed in recent months for all groups. Since the beginning of the year, the unemployment rates for all groups except Asians have improved, on net, and all are close to levels seen just before the previous recession.

The second exhibit provides information on the staff's forecast for economic activity. Starting with panel 1: Our forecast of real GDP growth in the December Tealbook was little changed from the one we presented in October. You can see this by comparing the dark blue bars with the light blue bars. However, after the Tealbook closed, we raised our forecast to that shown by the dots, as the Senate passed its version of a tax bill, boosting the odds of ultimate enactment and clarifying somewhat the size and the outlines of what we imagine might emerge as a compromise from the conference committee.

As described in panel 2, we now estimate that the legislation will reduce average annual revenues about $220 billion per year, or 1 percent of GDP, through 2020. That amount is twice as large as we had assumed in the December Tealbook.

We expect most of the effects on aggregate demand to come through consumption and business fixed investment. PCE likely will be boosted by higher disposable personal income—due to both lower personal tax rates and lower pass-through business taxes—as well as by higher wealth that results from lower corporate tax rates pushing up equity prices. BFI likely will be boosted by a lower user cost of capital that results from lower corporate tax rates and the introduction of full expensing for equipment and intangibles. In addition, BFI is anticipated to be supported by a positive cash flow effect coming from firms having more internal funds available for investment spending. The effects of other provisions included in one or both of the bills—such as increases in the standard deduction, changes to the deductibility of state and local property taxes, and a cap on mortgage interest deductions—appear likely, at this point, to have only small negative effects on house prices, residential investment, and state and local government purchases.

In addition to boosting our estimate of the effect on aggregate demand, we have now also built in estimates of aggregate supply effects of the tax legislation. First, we expect the lower marginal tax rates to induce an increase in labor supply both through higher labor force participation and by increased hours worked by existing employees. Second, increases in BFI are projected to raise the capital stock and boost labor productivity.

Panel 3 provides an accounting of the effects of our revised fiscal policy assumptions. As shown on line 1, we estimate that our assumptions would boost the level of real GDP in 2020 by about 1 percent, somewhat more than the effect of the placeholder in the December Tealbook (line 2). Our current estimate reflects a direct fiscal impetus of about ¾ percent (line 3), adds in multiplier effects (line 4), and nets out anticipated financial offsets due to higher interest rates and a modestly stronger dollar (line 5). In addition, some modest aggregate supply effects boost actual GDP as well as potential GDP (line 6). We estimate that the increment to the output gap (line 7) will be 0.7 percentage point.

As discussed in the Tealbook, the other change we made this round was to take our estimate of the natural rate of unemployment, the green line in panel 4, down another notch, to 4.7 percent by the end of this year. This change helps partially reconcile the downward surprises to the unemployment rate this year—which can be seen by comparing the black line and the red-dashed line—with the soft readings on core price inflation. Nonetheless, even with this change to the natural rate, we are still showing a somewhat tighter labor market over the forecast period, partly reflecting the fiscal stimulus package. Indeed, in our post-Tealbook projection, the unemployment rate reaches 3.3 percent in 2020, nearly 1½ percentage points below the downwardly revised natural rate.

Correspondingly, the output gap, shown in panel 5, is somewhat higher than a year ago. It is worth noting that the tighter economy only partly reflects changes to our fiscal policy assumptions, as the forecast made last December had incorporated a placeholder assumption for fiscal policy expansion. In an accounting sense, much of the upward revision to the output gap reflects stronger net exports, as Shaghil will show you in a moment.

As shown in panel 6, the version of the inertial Taylor (1999) rule that we use in our projection implies a modestly higher funds rate path beyond the near term than we projected a year ago. With a largely unchanged forecast for inflation, the stronger trajectory for the output gap raises the funds rate path despite a modestly lower jumping-off point and a ½ percentage point downward revision to r^* since last December. All told, the funds rate at the end of 2020 is almost ½ percentage point higher than we had last year.

The third exhibit provides information on the projections of inflation and employee compensation. This morning's PPI for November had no material implications for our projection of consumer price inflation. Tomorrow morning, we will update you on the implications of the November CPI release.

The black lines in panels 1 and 2 give our medium-term projections of total and core PCE price inflation, and the red dashed lines show the projections we made last December. Although inflation in recent quarters has been lower than we anticipated last year, our forecasts have generally been revised little, as we continue to judge much of the weakness to be related to transitory factors. All told, we expect core PCE price inflation to move up from 1.5 percent this year to 1.8 percent in 2018 and 2 percent in 2019 and 2020. Total PCE prices are expected to rise faster than core prices this year, partly due to a pop in energy prices this quarter, and then to rise at a pace similar to the core rate thereafter.

The third panel takes a closer look at core PCE price inflation through the lens of the staff framework. In our framework, core PCE inflation has moved around an underlying trend (not shown) that has been constant at a little below 2 percent, and we have that trend edging up slightly in the years ahead. The deviation of core PCE price inflation from that trend is plotted as a black line, and the bars decompose that deviation into resource utilization (in red), the effects of movements in import prices

(green), energy prices (blue), and a catchall "other factors" category (in yellow). As expected, the tightening of resource utilization that we saw on the previous exhibit acts to push up inflation in relation to its trend a little bit this year and more in the coming years, while import prices hold down inflation somewhat relative to its trend. What stands out, however, is the large negative contribution of other factors in 2017. The yellow portion of the bar is often large and volatile—such as in 2016, when it jumped due to surprisingly strong nonmarket prices—but it has not made a negative contribution since 2008. We continue to judge that transitory factors are contributing importantly to this year's soft readings, and you may recall that, last round, we allowed a little bit of that softness to continue through to 2018. Furthermore, we remain alert to the risk that the softness could prove more persistent than we project, partly because it appears to be in market-based components of the core PCE price index beyond just those categories for which we have special stories, like wireless services.

As you know, measures of compensation growth have been mixed lately, and we sometimes focus on the employment cost index as a relatively smooth measure, albeit one that tends to be somewhat less cyclical than some other wage measures. The black line in panel 4 displays the four-quarter change in the ECI. This measure appears to be rising 2¾ percent this year, but we expect it to step down to a 2½ percent pace thereafter. The colored bars decompose the changes into key components in the staff's framework, including underlying price inflation (blue), trend productivity (green), resource utilization (red), and other factors (yellow). All four components are contributing positively to hourly compensation this year. In particular, with the unemployment rate having moved below our estimate of its natural rate, resource utilization is estimated to boost compensation growth in the coming year and over the medium-term forecast period, even as we see the productivity trend making a notably smaller contribution than it did a decade ago. Shaghil will now continue our presentation.

MR. AHMED. Thank you. Foreign economic growth, according to our U.S. export-weighted aggregate shown in panel 1 of exhibit 4, temporarily dipped in the third quarter to 2¼ percent from 3 percent in the second, held down by natural disasters in Mexico and disruptions to auto production in Canada. Looking through the quarterly wiggles at four-quarter changes (shown in panel 2), foreign economic performance has been quite a bit stronger than we expected a year ago. We still see growth abroad settling at roughly its potential rate of 2¾ percent, with the recovery becoming more self-sustaining and less dependent on monetary stimulus, but we have gotten there faster and now see foreign real GDP growth moving to its potential rate from above, rather than from below. We are not exactly sure what accounts for the boom, but it is quite widespread; perhaps Santa thinks world central bankers have been especially good this year. [Laughter]

The widespread boom has been accompanied by some recovery in world trade (panel 3) and has led to an increase in resource utilization. As depicted for the major AFEs in panel 4, we estimate that output is now at or above potential in Canada,

Japan, and the United Kingdom, and less than 1 percent below potential in the euro area.

On inflation, Santa seems to be holding out a bit. [Laughter] Robust economic performance and increased resource utilization have not led to a substantial pickup in headline inflation in the AFEs (shown in panel 5), which is lower than what we thought a year ago it would now be. Headline inflation is responding to swings in oil prices (panel 6), but, as you can see in panel 7, we overpredicted AFE core inflation as well.

The next exhibit looks at the picture of underlying inflation in the AFEs in more detail. As panel 1 shows, even excluding the special case of Japan, core inflation generally continues to run low. In Canada and the euro area, core inflation over the past year (the blue bars) has roughly matched its average from the onset of the Global Financial Crisis to a year ago (the gold bars) despite the erosion of slack, and it has remained substantially below its pre-GFC average (the green bars). The exception is the United Kingdom. Substantial sterling depreciation after the vote for Brexit partly explains a pickup in U.K. core inflation.

For a better understanding of the dynamics of inflation, panel 2 presents the results that come from using a simple model of euro-area core inflation as a function of its own lagged value, inflation expectations, the output gap, and supply and tax factors. According to this model, the negative impetus to inflation arising from the output gap has moderately diminished since 2013, as can be seen from the red portions of the bars. But over much of this period, core inflation (the solid line) has still systematically come in quite a bit below the model's predictions (the dashed line). This year, core inflation appears to have increased in a manner that matches the model's prediction. But this development is not very heartening, as the predicted value remains well below 2 percent despite the substantial erosion of resource slack—suggesting that underlying inflation remains low. For Canada, too, though not shown here, the predicted rate of core inflation generated by a similar model is currently well below 2 percent.

Panel 3 presents some results using an alternative statistical model that jointly estimates trends in inflation and unemployment for each country. This model finds trend inflation rates in Japan, the euro area, and Canada to be well below 2 percent currently. For the United Kingdom, the same model indicates trend inflation to be about 2¼ percent, but this result may be due to the model not controlling for the effects of the recent sterling depreciation.

Panel 4 lists some familiar potential explanations for why inflation may be falling short of the target. First, true inflation expectations may be less anchored than the survey-based expectations used in the models and may have moved down. Second, there may be greater slack in the economies than the estimated output gaps are indicating. For the euro area, the unemployment rate (not shown) is still well above its pre-GFC trough and suggests this, but unemployment rates in Japan, Canada, and the United Kingdom have retraced their increases following the GFC. Third, global

slack may matter for inflation in addition to domestic slack. However, as was reported previously in a memo to the FOMC, the staff have found little evidence supporting this hypothesis. Finally, other global factors, such as the rise of China and the growth of value chains, may have lowered trend inflation around the world. These particular factors should work largely by containing increases in goods prices, but, as panel 5 shows, it is a decline in services inflation, not in core goods inflation, that accounts for the persistent weakness in core inflation. This suggests that something else is restraining inflation, but exactly what remains unclear.

All in all, prospects for a sustained pickup in underlying inflation in AFEs are still uncertain, particularly in the euro area and Japan. Consequently, AFE central banks are expected to maintain accommodative monetary policies, as can be seen in panels 6 and 7. We expect the ECB to wait until late 2018 to end its asset purchases and not begin hiking its policy rate (the blue line in panel 7) until mid-2019. In Japan (the green lines), we see monetary policy remaining highly accommodative throughout the forecast period, and we expect the Bank of Canada and the Bank of England, which have begun raising rates, to proceed gradually in their further normalization.

Perceptions of global risks continue to ease, and financial markets have become unusually quiescent. But we central bankers are paid to worry—and China risks, discussed in exhibit 6, are prominent among our international worries. As you know, total credit in China (panel 1) has ballooned since the GFC, much of it through "nontraditional" channels. A good deal of this credit goes to nonfinancial corporations. Chinese corporate debt-at-risk (the red bar in panel 2), defined as the debt of firms with ratios of earnings to interest expenses of less than 2, now exceeds, as a share of GDP, the debt-at-risk we saw in the Asian-crisis countries just before that crisis. Other EMEs do not appear as vulnerable as China on the debt-at-risk metric.

China does have some special mitigating factors: low external debt, large state-sponsored banks (a factor that decreases the likelihood of a sudden drying up of credit), ample fiscal space that can be used, if necessary, to bail out the state-owned enterprises that owe much of the debt, and still-robust GDP growth, even with a downward trend. Nevertheless, China's corporate sector would be stretched further by adverse shocks. Adverse developments could, in the extreme, trigger a run on parts of the financial system, a property-sector bust, a very large and disruptive depreciation of the currency, or all of these outcomes.

The dilemma facing Chinese authorities is that, although curtailing credit growth rapidly would restrain indebtedness and thus limit longer-term financial instability risks, it could push down GDP growth enough to trigger the financial stresses it was intended to forestall. Judging the exact response of economic growth to credit is tricky, as causality runs both ways, but the massive credit-financed stimulus undertaken during the GFC may serve to identify the causal influence of credit on growth. In panel 3, the horizontal axis plots the credit stimulus that different Chinese provinces received in the 2008–09 stimulus package, and the vertical axis plots the

cumulative change in provincial GDP relative to trend through 2011. Provinces that got bigger credit stimulus experienced significantly higher GDP growth.

These results imply substantial negative effects on aggregate output growth of a credit crunch. Specifically, a 1 percent of GDP decrease in credit would reduce real GDP cumulatively about 0.4 percent. We would not put too much weight on this specific estimate. It does suggest, however, that pushing down credit growth to be in better alignment with GDP growth, shown in panel 4, could trigger a serious economic slowdown.

Were Chinese growth to slow sharply, how much of a problem would that pose? Such a slowdown would likely hit other EMEs hardest, and that linkage has probably grown over time. Panel 5 plots the coefficient on Chinese GDP growth of a rolling regression of growth in other EMEs on China's growth, controlling for advanced-economy growth. This coefficient has risen substantially over time, indicating that every percentage point change in Chinese growth now directly affects growth in other EMEs by about half of that.

How would a sharp slowdown in China and in the other EMEs, likely roiling global markets, affect the U.S. economy? This was the focus of our "China-Driven EME Turbulence" alternative scenario in the December Tealbook. As shown by the blue line in panel 6, the negative effects on U.S. growth in this scenario are significant and imply a decline in the level of real GDP of 1.5 percent over two years. This effect is bigger than the effects on the U.S. economy that we saw in actual past EME crises because of the increased importance of China and other EMEs in the world economy. To illustrate this point, when we calibrate the responses of our model to 2000 trade and GDP weights and the lesser financial spillovers that existed then, the simulated effects on U.S. real GDP (the gold line) are about half as large. The monetary policy flexibility possessed by the Federal Reserve also matters. Under a scenario in which the effective lower bound was as binding as in 2013, the simulated hit to the U.S. economy (the red line) would be larger.

Exhibit 7 looks at the U.S. external sector. The broad real dollar, shown in panel 1, has fallen this year and is significantly below the path we projected last December. On the basis of the greater rise in the United States than abroad in expectations of near-term policy rates and, lately, increased prospects for U.S. tax reform, we would have expected the dollar to appreciate this year. But, apparently, solidifying foreign growth prospects have boosted foreign currencies, and an increase in global risk sentiment may also have lessened flight-to-safety flows into the United States. We are still expecting a moderate appreciation of the dollar, reflecting our assumption that markets will be surprised by the pace of U.S. monetary policy tightening.

In part due to the lower path of the dollar, the contribution of net exports to U.S. real GDP growth (panel 2) is coming in positive this year rather than the negative contribution we projected a year ago. As the dollar appreciates, the net export

contribution should turn slightly negative. Bob Tetlow will now continue our presentation.

MR. TETLOW.[3] I will be referring to the packet labeled "Material for Briefing on the Summary of Economic Projections." To summarize, your projections show notably more strength in near-term real GDP growth than those you submitted in September, with the unemployment rate running somewhat further below your estimates of its long-run normal level during the projection period. Beyond 2017, differences from your September inflation forecasts, whether with regard to headline or core PCE inflation, are scant. Your assessments of the uncertainty and balance of risks surrounding your projections are largely unchanged from September.

Exhibit 1 summarizes your economic projections, which are conditional on your individual assessments of appropriate monetary policy. As shown in the top panel, the median of your real GDP growth projections this year is 2.5 percent, while the median of your estimates for its longer-run rate is 1.8 percent. The median projection of real GDP growth stays at 2.5 percent in 2018. Thereafter, it gradually declines. Most of you have indicated that prospective changes in tax policy contributed a modest boost to your projections of real GDP growth over the next couple of years, although some of you indicated that those tax changes were not the only factor leading to your forecast adjustment. Several of you also mentioned that you anticipate a small positive effect of fiscal policy on longer-term real GDP growth.

As shown in the second panel, the median of your projections of the unemployment rate for the fourth quarter of both 2018 and 2019 is 3.9 percent, well below the median of your estimates of its longer-run normal level of 4.6 percent. The median projection of the unemployment rate ticks up slightly in 2020, and nine of you project an increase in the unemployment rate that year.

The third panel shows that the median of your projections of headline PCE price inflation rises from 1.7 percent this year to 1.9 percent next year and then to 2 percent in 2019 and 2020. With data on core inflation in recent months having come in close to the expectations of most observers, your narratives suggest somewhat greater confidence that recent weak inflation readings will prove transitory. However, a few of you expressed concerns that either the underlying trend of inflation could be lower than generally thought, or that longer-term inflation expectations may have edged down.

Exhibit 2 compares your current projections with those of the September SEP and the December Tealbook. As indicated in the top panel, the median of your forecasts for real GDP growth starts out in 2017 just one-tenth higher than it was in September, but the difference climbs to 0.4 percentage point in 2018 before falling back in 2019 and 2020. As shown in the second panel, relative to September, the medians of your

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

forecasts for the unemployment rate are 0.2 percentage point lower for all four years from 2017 to 2020.

A majority of you cited likely changes in fiscal policy as one reason for boosting your forecasts of real activity and unemployment, although other developments, such as the improvement in the global economic outlook or favorable incoming economic and financial data, also explicitly played a role in some of your forecasts. Changes in fiscal policy were not a major feature in your forecasts in September, when most of you did not assume a fiscal stimulus package. And several of those who did penciled in a smaller fiscal package than in this projection.

As can be seen in the third and fourth panels, the medians of your forecasts of headline and core PCE inflation for next year and beyond are unchanged from September.

The medians for your projections of real GDP growth and inflation show trajectories that are broadly similar to those in the December Tealbook. However, the Tealbook continues to project a more pronounced undershoot of the unemployment rate below its longer-run normal rate. In terms of changes from September, your assessment of the news since then was more muted than that of the Board's staff, who forecast a more persistent increase in GDP growth and a larger decline in the unemployment rate. Much or all of the difference in response appears to be because, generally speaking, you included a notably smaller estimated effect due to fiscal policy than the staff did. That said, most of you also expressed the view that uncertainty surrounding prospective changes in fiscal policy and their economic effects was still substantial.

Exhibit 3 provides an overview of your assessments of the appropriate path for the federal funds rate. The median of your projections, indicated by the red horizontal lines in the top panel, stands at 1.38 percent for the end of this year, with all but two of you indicating that a 25 basis point rate hike at this meeting would be appropriate. In the medium term, the medians of your projections gradually rise, reaching 3.1 percent in 2020—a bit above the median for the longer-run projected value of 2¾ percent.

Compared with your September submissions, the median federal funds rate projection is the same for 2017 through 2019, but it is 20 basis points higher for 2020. Among the 15 of you who submitted an estimate of the longer-run normal level of the federal funds rate, all but 1 now see it as likely to be appropriate for the federal funds rate to rise above your estimate of the longer-run normal rate at some point. In September, just 9 of you projected that outcome. Finally, the median of your estimates of the longer-run federal funds rate was unchanged in this forecast.

The red diamonds in exhibit 3 show the median prescriptions for the federal funds rate implied by a non-inertial Taylor (1999) rule, given your individual projections of core inflation and the unemployment gap, and using your estimates of the longer-run federal funds rate as the intercept term. You have, for some time, been projecting

levels of the federal funds rate for next year and 2019 that are well below these prescriptions. In the current SEP, the median of the gaps between your funds rate projections and rule-implied federal funds rates has widened further, reaching a bit over 200 basis points in 2018 and 150 basis points in 2019. The median Taylor rule prescriptions for the federal funds rate in 2018 and 2019 have moved up at least 50 basis points above the prescriptions implied by the September SEP. The higher rates prescribed by the non-inertial Taylor (1999) policy rule, adjusted for your individual intercept terms, mostly reflect the downward revisions to your forecasts for the unemployment gap.

The upper panels of exhibits 4.A through 4.C show the median projections—the red line—surrounded by confidence intervals derived from historical forecast errors of various private and government projections. The lower-left panels of these exhibits show the distributions of your assessments of the uncertainty attached to your projections, which were essentially unchanged from September: Nearly all of you view uncertainty for all variables as broadly similar to the average of the past 20 years. In your narratives, four of the eight who offered comments suggested that ambiguities associated with the pending fiscal package had raised your assessment of uncertainty for GDP growth, albeit not by enough to tip your overall assessment into the higher-than-normal category.

The lower-right panels of exhibits 4.A, 4.B, and 4.C summarize your assessment of risks to the outlook. Here, too, your views differ only marginally from September. There was a slight shift in the direction of strength in that two more of you now see upside risks to real GDP growth, and one more of you now sees risks to the unemployment rate as weighted to the downside. In addition, one more of you than before sees an upside risk to inflation. In terms of the narratives you offered, with so many of you seeing the risks to your forecast as balanced, it should not be surprising that you cited risks on both sides. However, one theme that did show through, at least for some of you, was the risks stemming from your unemployment forecasts—on their own or in conjunction with changes in fiscal policy—for either higher inflation, financial instability, or a recession.

Your final exhibit shows a fan chart pertaining to your median projections of the federal funds rate. It is based on historical forecast errors for short-term interest rates. Given the medians of your assessments of the appropriate level of the federal funds rate in coming years and large historical forecast errors, the fan chart implies a 70 percent probability that the level of the federal funds rate will be within a range of 0.7 to 3.5 percent at the end of 2018, with the range widening to 0.7 to 5.5 percent in 2020. The lower edge of this range is moderately higher than the 0.2 percent value that we reported to you in September. Thank you. That concludes our prepared remarks. We would be happy to respond to your questions.

CHAIR YELLEN. So, questions for any of our presenters? President Bullard.

MR. BULLARD. Okay. I'm back on exhibit 2, panel 5, which is "Output Gap Estimates." This figure, as far as I can read it, says that in 2018, the output gap will be about 2 percentage points, according to staff estimates. And I want to relate this to exhibit 3, panel 3, which is "Core PCE Price Inflation"—2018, resource utilization, the red box, 0.1 percent. So the output gap is going to be 200 basis points, and out of that we're going to get 0.1 percent in inflation. Is that the correct interpretation? And is that statistically different from zero?

MR. STEVENS. Sorry. Could you give me the two numbers that you said again? You had—

MR. BULLARD. I got the output gap in this chart 5 at 2 percentage points, if I'm reading it correctly. Is that right? And then I got the inflation on exhibit 3, panel 3, "Core PCE Price Inflation: Decompositions of Deviations from Trend." The part due to resource utilization is the red box for 2018. It's 0.1 percent. So the ratio is 20 to 1, if I have it right—200 basis points to 10 basis points.

VICE CHAIRMAN DUDLEY. So you're just saying you have a very flat—

MR. BULLARD. Emphasizing that the Phillips curve is extremely flat.

MR. STEVENS. I think the coefficient in our decomposition, if I recall correctly, is on the order of 0.15 times a measure of slack. So that would be about right.

MR. WILCOX. And there's a little lag.

MR. BULLARD. Oh, there's a lag?

MR. WILCOX. There's a little lag, if I'm recalling correctly, in the relationship of resource utilization to inflation.

MR. BULLARD. As a policymaker, should I think of that response as being importantly different from zero?

MR. WILCOX. I guess I'd say "yes." It's attenuated from what it used to be, and it's one of the two channels through which we think you have the predominant element of your force on inflation, the other being through the exchange rate and core import price channel. And that's the lever you've got. Let me use the plural: Those are the levers you've got.

MR. BULLARD. Okay. Thank you. I have—oh, maybe Vice Chairman Dudley wanted to come in on this.

VICE CHAIRMAN DUDLEY. No, no. Go ahead.

MR. BULLARD. Okay. I have one other question. This is on the material on our projections. On page 3, we give the dot plot, we give the median dots here, and then we give what the Taylor (1999) rule says. Why are we doing the Taylor (1999) rule on here? Why do we say that? Why don't we just present the dots and talk about the dots?

MR. TETLOW. Well—

MR. BULLARD. I mean, I think it's kind of—I don't know what you're doing. I don't care about the Taylor (1999) rule. [Laughter]

MR. TETLOW. I think it's useful to have some semi-independent metric of where the federal funds rate setting might be, so that you can ask yourselves why there's a discrepancy as large as it is. It could be that the answer is, "I don't care what the Taylor (1999) rule says." [Laughter] That's a perfectly acceptable answer.

MR. BULLARD. Well, is it a Taylor (1999) straight out of Taylor, or is it a Taylor (1999) with an adjusted r^* value?

MR. TETLOW. Well, there are two things different here. First, there is the adjustment of the r^*, which comes from each of your individual estimates of the longer-run natural rate of

interest, which we have to take to be a constant. The other thing is, we're using PCE inflation here instead—Taylor used GDP price inflation. Otherwise, it's exactly—

MR. BULLARD. My own preference is that you take it out. I just want to see what the Committee thinks, and I'm aware that there are many benchmarks against which you could compare that. But this gives an air of "this is the right number" or something, which I don't agree with.

MR. LAUBACH. President Bullard, we provide a variety of these benchmarks in Tealbook B as well.

MR. BULLARD. Not on this chart. This is—

MR. LAUBACH. And, I mean, we could, if you also wished, provide several benchmarks on this chart. That would be an alternative.

MR. BULLARD. I just want to know what the Committee came up with. Thank you.

CHAIR YELLEN. Vice Chairman.

VICE CHAIRMAN DUDLEY. I have a question for the staff. If you look at the staff forecast, and if you look at the SEP forecast, it has inflation going back to 2 percent but not above 2 percent. And I presume that the staff thinks that inflation expectations are somewhat below 2 percent to date. So is the staff view that the goal should be to go to 2 percent and, after a really, really, really, really, really long time passes, that inflation expectations will converge to 2 percent? Or does the staff think it would be better to actually go a little bit above 2 percent to cause that convergence to happen more quickly?

I think it's relevant to the SEP, too, because the median SEP path just goes to 2 percent. So I'm asking sort of a broad conceptual question. Is optimal policy now to basically push inflation above 2 percent, to get inflation expectations up to 2 percent more quickly? Or is

optimal policy to converge to 2 percent—core PCE, 2 percent inflation—just keep it there for a very long time? I mean, I'm not—this is not a trick question. I'm really curious what you think about this. Because I think it's really quite consequential for the Committee in terms of how they present their forecast and their outlook. Do we want inflation to go above 2 percent or not? I'd just like to hear what the staff's view on that is.

MR. STEVENS. At least over the medium term, you're right—we don't have it getting above 2. I think we have it just barely getting a little bit above 2 for—

VICE CHAIRMAN DUDLEY. It could happen beyond 2020, and you're forecasting that. I can't really tell what you think is optimal. Is it to stay at 2 forever and then gradually—inflation expectations get back to 2, or is it to go above 2, to get inflation expectations back to 2 more quickly? I mean, there must be some cost of having inflation expectations below 2 for a longer period of time, right?

MR. WILCOX. So can I—

VICE CHAIRMAN DUDLEY. I'm just curious. I'm just really curious.

MR. WILCOX. First of all, I want to state very clearly that there isn't a concept of optimality in our projection. We conditioned the staff forecast on a very mechanical application of the inertial version of the Taylor (1999) rule. We do have some aspiration that the policy rule that we use won't be too detached from how you're thinking about the world. But what we want to do is provide a projection that's conditioned on a fixed yardstick, something that isn't changing because we woke up feeling optimistic or pessimistic. So—

VICE CHAIRMAN DUDLEY. Okay. So put that aside for a minute.

MR. WILCOX. Yes. I was stumbling on "optimality." What is optimal? What does the staff feel is optimal? We're not putting forward a statement of our view of what optimal policy is in the baseline projection. In terms of the mechanics—

VICE CHAIRMAN DUDLEY. So what do you think is optimal? That's what I'm really asking, fundamentally. The staff view is that inflation expectations are below 2 percent. What is the ideal way of dealing with that? I guess that's the question.

MR. WILCOX. I'm more than happy to put on a "normative" hat, but I just want to be very clear that you're—I'm doing that at your invitation.

VICE CHAIRMAN DUDLEY. Yes, you are. [Laughter]

MR. WILCOX. Because we're quite at pains to be not normative in the construction of the Tealbook projections. So this is a mode shift. I guess my own view is that the Committee needs to demonstrate that the indication in your consensus statement is correct—you know, that you're standing by that statement that the 2 percent objective is a two-sided symmetric objective, and that, therefore, you ought to be approximately as willing to tolerate errors on one side as you are to tolerate errors on the other side. And when I have my "normative" hat on, I'm concerned about a perception that inflation expectations might become solidified on the view that the Committee regards 2 percent as an asymmetric objective or as something to be approached from below.

VICE CHAIRMAN DUDLEY. The reason I'm bringing this up is, I feel that there might be some hesitancy on the part of the Committee to show inflation numbers above 2 percent. And I worry that if we have that hesitancy, we might actually be communicating something that we actually don't believe, sort of, fundamentally. That's really what I'm trying to get at.

MR. WILCOX. So there is not a hesitancy in the staff projection to show inflation projections above 2 percent. This is an attempt on our part to lay out, in a very dispassionate manner, what we think the outlook is, conditioned on a particular policy baseline. If you wish to give us clear instruction about a policy baseline that you would prefer us to use, we'd be more than happy to do that. The way we would do it is, we'd take our assessment of the underlying economics and we'd project them onto the different policy baseline.

VICE CHAIRMAN DUDLEY. Let me be clear. This is not a criticism—

MR. WILCOX. No, no, no. I just—

VICE CHAIRMAN DUDLEY. I'm really trying to draw out a deeper—

MR. WILCOX. I'm not trying to reflect back to you that it's a criticism. I do want to be very clear, though, about the conceptual basis on which we try to put together the forecast.

MR. LAUBACH. The Monetary Policy Strategies section is perhaps a little bit less reluctant to venture into normative territory, and there you can always see that there are a couple of factors on which the answer to the question, "to what extent could an overshoot of inflation be optimal," depends.

One is the nature of the loss function. The second one is the dynamic tradeoff between resource utilization and inflation. So for the situation, for example, in which you had still the unemployment rate above the natural rate, you will recall that, in that situation, these simulations actually frequently showed overshoots because, basically, you wanted to accept the overshoot in order to make more rapid progress on the unemployment rate. Again, the first thing I mentioned is the nature of the loss function. I mean, do you care symmetrically about undershoots and overshoots of the natural rate or not?

Finally—and here I'm speculating, but—that goes back to the issue of the underlying inflation rate. One of the things that we are quite uncertain about is not only where that object stands, but also how it responds to actual inflation observations. To be very clear: I'm speculating here. But I could imagine that these results could also depend on what updating mechanism you choose for that concept of underlying inflation.

The exercises that you see under the optimal control simulations are all done under anchored long-run inflation expectations. But if, instead, you thought that, right now, long-run inflation expectations were running a little lower than your 2 percent objective and you had some learning mechanism in place that might be—again, something might—that could push you toward having an overshoot for a while in order to boost these—

VICE CHAIRMAN DUDLEY. Because on your side of the aisle, inflation expectations are moving upwards from below 2 percent, right?

MR. WILCOX. They are. They come up at a glacial pace, in a rather mechanical, ad hoc manner, to 2 percent. It is also the case that we do have an updating function in which the longer the economy runs hotter, the faster inflation expectations will move up. I would also point you, just briefly, to the lower-left-hand panel on page 38 in Tealbook A. It does show our inflation projection over the longer term, and it shows that we have a very small, but quite persistent, overshoot by inflation of the 2 percent objective. Eventually, in the ultra-long term, the policy rule succeeds in driving both legs of the dual mandate to their desired levels.

VICE CHAIRMAN DUDLEY. I guess, fundamentally, I feel like we have a little bit of a risk as a Committee, in the sense that we claim it's a two-sided inflation target, yet we're not willing to show inflation going above 2 percent. Now, it could be that it's beyond the forecast horizon of the SEP, but it is a—

MR. WILLIAMS. 6 of the 16 have overshoots. This is a funny conversation to be having right now.

VICE CHAIRMAN DUDLEY. Well, because the median is what gets all of the attention.

MR. WILLIAMS. Okay, but half of the Committee—

CHAIR YELLEN. I mean, there are 7 participants who have overshoots in 2020 in the SEP.

MR. WILLIAMS. It seems like a funny time to bring this up, because I think almost half of our submissions, including mine, have an overshoot.

VICE CHAIRMAN DUDLEY. Half of 16?

MR. WILLIAMS. Well, not half. But, I mean, it's a lot. It's not 1 or 2.

CHAIR YELLEN. Governor Brainard.

MS. BRAINARD. I don't think of this as a normative statement. I think of this as a forecast. And we could spend a lot of time asking the staff to explain their forecast. The truth is that it has a very flat Phillips curve, alongside an underlying inflation trend that the staff is estimating at 1.8 percent. Without actually mechanically or judgmentally adjusting that underlying trend up, they have a hard time getting actually to 2 percent in the forecast horizon. You can correct me if I'm getting this wrong, but it just goes to show, once that underlying trend has started to drift down, how difficult it is for us to make inflation gently arrive at our symmetric 2 percent goal in the forecast horizon.

CHAIR YELLEN. President Evans, did you have a question?

MR. EVANS. I have a regular question. It's not a two-hander.

CHAIR YELLEN. Okay. Are these two-handers? [No response] President Evans.

MR. EVANS. Thank you, Madam Chair. While I have the opportunity on the dot chart, I'd just like to say that I'm not offended by the presence of the Taylor rule on that dot chart. [Laughter] I'm perfectly fine with that. In terms of the particular dimensionality, I do note that there are two dots almost hidden by that red diamond in 2020.

I have a question, though. On exhibit 2, chart 2, "Potential Effects of Tax Legislation," I thought the memo was very well done. I couldn't have done any of those things any better. I did note that on the labor supply effect, I know that you were careful to choose elasticities that were produced by the range of agencies that do that for a living, so that's good. It did seem like it was kind of a big effect, and I guess the question that I have is, is there any type of state contingency to this effect? I mean, we're talking to a lot of people out in the business world, and they're saying they can't find the workers they're looking for, the people with skills. And the write-up mentioned that much of the inflow is going to be of secondary workers. Are they the ones who are on the sidelines with the skills but not quite enticed to come in? Like I said, I couldn't do a better job with this. I think this is what the forecasting would lead you to, but in the state of the cycle that we're in, would you—any thoughts?

MR. STEVENS. So, it is the case that we took a midpoint of the elasticities in the literature, and we have a slower adjustment than some outside people would assume, such as the JCT. I think it's a fair point. I would point to what your own research staff has done, though, in terms of collecting information about plans for increased wages. We've been asking these questions for a number of years, and this is the first time these have been at a level like this. So whether it actually pans out, I don't know, but if we start seeing some real wage increases, that could solve the issue you raise.

MR. EVANS. Thank you.

CHAIR YELLEN. President Williams.

MR. WILLIAMS. I had a couple of questions on the briefings. On exhibit 1, panel 3, I really liked this work about combining the information given by the ADP and the BLS. I think that's really a valuable use of multiple data series to get a better reading. And I understand the way you promoted this was to reduce some of the noise, get a cleaner read, something I absolutely agree with. But when I looked at this chart, I also noticed something that you mentioned, but it stood out. If you look at the underlying estimate, instead of just thinking about the month-to-month movements, think about what's been happening over the past year or so. It seems like this cleaner read that combines the two sources is significantly higher than the standard BLS reading. So if I take this as being a better read on really what's happening to employment growth and then kind of feed that through into the rest of the analysis, do you also read this as just much lower productivity growth over the past year or so in the economy than we're seeing in the standard BLS releases, or should I probably not go there? That's my first question.

MR. STEVENS. As this is still very much a research-based series, I don't know if I'd want to go that far. Certainly, the direct implication would be that activity would be a little bit lower, perhaps. But, again, this is a research-based series. We're still trying to understand the data. A lot of effort has been made to try to make sure we're making something as close—that's as comparable to measuring what we're trying to measure as we can. But we're still learning.

And the other thing to keep in mind is that this is not a fully benchmarked BLS series. So as the benchmark revisions come out, it could push things up closer to the ADP series, at least a little bit.

MR. WILLIAMS. I just think that's an interesting question to think about, as we get more confidence in this series, which seems to me a better way to think about this. You know, what are the other implications of this, along lines similar to how we talked about GDP and GDI over recent years. So this is great. My second question really is—

MR. WILCOX. Could I just hop in for a second?

MR. WILLIAMS. Yes.

MR. WILCOX. We've been trying to, exactly as you suggest, build up our confidence in this. We've been working on it for a couple of years, so I don't think we've been particularly fast out of the gate on it. However, an awful lot of effort has gone into it. Over the past couple of years, exactly as you observed—help my memory—the ADP series has been increasing by about an average of, I think, about 65,000 per month faster. We don't really know what to make of that. One possibility is that there's just a heterogeneity. BLS has a scientifically constructed, probability-weighted sample. ADP does not. There could be inherently some unobserved heterogeneity among firms that are randomly selected into the BLS sample versus those that make the overt choice to become clients of ADP. It is the case that ADP services, roughly speaking, the same amount of employment as the BLS.

Now, we're going to need to get this peer reviewed. We are a long way from putting it forward to you as the basis for a policy decision, but we thought things were far enough along that it seemed worth putting on the table for you to give it a little bit of a sniff test. We want to let you know we're running this one around the block and trying to stress test it in the real-time laboratory.

MR. WILLIAMS. That's great. So my second question was actually a follow-up to President Evans's question about the fiscal policy assumptions, in panel 3 of exhibit 2. And I

was curious—and I may have just missed this, I thought the memos were terrific, really helpful for us, but—for these estimates, I'm really focused, like President Evans, on the supply side, on potential GDP. So these refer to the cumulative effect as of the end of 2020. If you rolled that out further and thought about where they would be in kind of the 2025 range or longer-term range, what's your view, if you have one, on the level effect on potential output in particular?

MR. STEVENS. I think we're getting up closer to eight-, nine-tenths. In particular, the capital effect drags out because we assume there are adjustment costs that make it take a while for the full effect on capital to show through. And so, when you get further out, the effect would be somewhat larger.

MR. WILLIAMS. I'm just trying to make sure I've got my facts straight. Would it be consistent with that if I were to average over, adding one-tenth to my view of potential GDP growth per year in the medium term? And not in the long, long run.

MR. WILCOX. I think that's right, and yet we chose not to mark up our long-term estimate of normal GDP growth, partly because implicit in our assessment is an assumption that there will need to be some way to finance the tax cut. And what we have is that, starting after five years, unspecified deficit reduction actions are taken to raise revenue to stabilize the deficit at a sustainable level. Now, there will be a permanent bump to the debt-to-GDP ratio, but the deficit comes back to a sustainable level. Eric, do you want to add anything to that?

MR. ENGEN. No, that's about right, in the sense that we have offsetting policy actions that will bring it back to a sustainable level. We haven't specified what those actions are, and you could imagine them going different ways depending on, say, what taxes are raised, what spending is cut—say, prospective spending that could still go through, for example. So we haven't taken a specific stand on that. Also, if you think about it, we have a specific start of this

re-stabilization. How long that would actually take—the longer it took, the higher would be the level of debt, and, all else being equal, that would tend to put some upward pressure on interest rates as well.

MR. WILLIAMS. That's very helpful. Thank you.

CHAIR YELLEN. President Kashkari, did you have a—

MR. KASHKARI. Yes, okay. Thank you. I have two quick questions—one on today's presentation, and one on the Tealbook. On today's economic and financial situation briefing, on exhibit 4, the bottom right, I'm trying to understand—there's panel 7, "AFE Core Consumer Prices," that shows a pretty aggressive forecast, but then on the next page, page 5, it shows trend core inflation for these advanced foreign economies. How do those two connect to each other? Do I look at the trend core inflation—if I just try to aggregate them, it seems like it's pretty low, and yet on the previous chart you see pretty aggressive increases in core consumer prices. I'm just curious. How are those two related?

MR. AHMED. Yes. So this trend reported in the table is computed from a statistical model, so it's not forward looking. It's looking basically at the recent data before us, and it can vary over time. It's not like a trend that stays constant, and it used to be—if you go back long enough for several of these countries—above 2 percent, and lately it has been—

MR. KASHKARI. But do you think, intuitively, it moves around quickly?

MR. AHMED. No, it's still moving. It doesn't move that quickly, but the thing is—so, our forecast is kind of—first of all, there's a lot of uncertainty in it, and the outcome could, you know, be lower, but it is based on this continual monetary accommodation, even in the face of the output gap closing. And I am hopeful that—I actually think that those survey expectations are pretty flat and that they do not really represent the true expectation. And so that monetary

accommodation is going to push up those expectations. How fast is uncertain, and this is kind of our baseline.

MR. KASHKARI. Thank you. Second question. In the Tealbook there was a box, which I really appreciated, on the inverted yield curve in the staff baseline forecast and why it shouldn't be so concerning. And it doesn't forecast recession even though, as we discussed last time, for four years we would've been inverting the yield curve. So I'm skeptical that we wouldn't not trigger a recession in that scenario. But I would also note that some of the arguments some folks around the table are making on why we should be raising rates now refer to the case in which the Phillips curve steepens all of a sudden. But I would note, even in the alternative scenario in which the Phillips curve steepens all of a sudden, we also don't trigger a recession. And so I'm wondering how much confidence should we have in either of those situations, that neither an inverted yield curve for four years would cause a recession nor would responding to a steeper Phillips curve cause a recession. My gut tells me that, probably, in both scenarios, it would trigger a recession. And the question is, do we trigger the recession in advance or do we trigger the recession in reaction? I'm just curious how the staff would respond to that.

MR. STEVENS. I think our assumption is that it does not trigger a recession, but that it certainly increases the risk of a recession, taking into account where rates are and where the term premium is. So an adverse shock would be more likely to tip us into a recession than is the case now, but we still don't think there's a causality there between the yield curve and a recession.

MR. KASHKARI. And how about in the alternative scenario with the steeper Phillips curve? I mean, that also—GDP growth gets down to 1 percent, which doesn't seem like a terrible outcome.

MR. STEVENS. I don't think I've looked at what the yield curve looks like in that situation.

MR. KASHKARI. Okay.

MR. WILCOX. There is an aspect of our simulations that is what it is. The models that we use to generate those simulations are well-behaved, nice linear models. They don't have any special dynamics that take over when the economy is close to what is sometimes referred to as "stall speed." Dan Sichel, among many others, has studied the fact that dynamics seem to differ around recessions in ways that don't comport comfortably with tidy linear models that have nice Gaussian errors. And that's not taken into account in the baseline projection. In the baseline projection, we're employing a linear structure that presumes that smooth adjustment is possible.

I think that, as John highlighted, you're definitely skirting closer to conditions that would be consistent with a recession, and so a smaller shock would be sufficient to tip you into—if those nonlinear dynamics exist, a smaller shock would get you there, into that downward spiral that seems to characterize typical postwar recessions in the United States.

MR. KASHKARI. May I ask one follow-up?

CHAIR YELLEN. Of course.

MR. KASHKARI. If I'm not mistaken, in 2015, the Tealbook was estimating around a 5 percent chance of recession in the next year or so. And I think that's up to 15 percent now. Is that a marginal difference, in your opinion?

MR. STEVENS. I don't remember the 2015 Tealbook, but I don't think the 15 percent—my recollection is, we've been around 13 percent or 14 percent for quite a while. I don't consider that, personally, particularly high.

MR. EVANS. It's the unconditional probability.

MR. WILCOX. I think the unconditional probability of recession is probably 15 percent or 20 percent, something like that.

MR. EVANS. So 5 percent is low.

MR BULLARD. David Wilcox, would a simple summary be that recessions in the model are caused by shocks? You're never going to get a recession unless there's a shock, and the internal dynamics of the model never cause a recession. So even if the yield curve is inverted, that doesn't necessarily mean there's a recession, unless there's an appropriate shock that causes the recession.

MR. WILCOX. Yes, broadly, I agree with that. I guess I'd say, in these kinds of models—at the risk of confusing the conversation, I'm going to refer to the FRB/US model, even though FRB/US isn't literally the source of the baseline projection—in a model like FRB/US, recessions are characterized by large negative shocks that are correlated across sectors. So bad things have to happen in multiple sectors simultaneously, and then the other dimension is that those shocks are negatively correlated for a longer period of time. By the way, that was the motivation for why we modified the methodology that we used to calculate the confidence intervals that we generate—so that we no longer are generating confidence intervals on the recession by doing random draws on nicely behaved error terms.

So you're correct. In our projection, recessions are going to be caused by large negative shocks that will be correlated over time. So there will be a succession for a few quarters of a negative shock. And in the baseline projection, the nature of how things work is that because those shocks are absent, policymakers are able to nudge the economy gently toward the dual-mandate values.

MR. BULLARD. Thank you.

CHAIR YELLEN. President Kaplan.

MR. KAPLAN. I'll just make one comment, reacting to this simulation and the inverted yield curve. Even though that's what your analysis shows, I guess that won't change that, as we're removing accommodation, if we get into a situation around the table here—that you're forecasting we will or saying we will, which probably is true—that we actually have an inverted yield curve, I assume we're going to have a—we'll all reserve the right to have a healthy debate as to whether we want to let that happen. I certainly will be one that will be initiating a healthy debate at the time as to whether that's the right thing, even though I understand that your analysis shows that we can have an inverted yield curve without causing a recession. That doesn't mean we won't. I'm just calling out that I'll probably be one of the ones around the table who will say, "Let's have a very intense debate about that."

MR. WILCOX. There will be a huge amount of uncertainty about that. That will be a very good conversation to have. In the framework of our projection, the reason why you get an inverted yield curve is, that's what you need to do in order to slow the economy and nurse the unemployment rate back up to its assumed long-run sustainable level.

MR. KAPLAN. And I guess one of the reasons I can imagine we'll have the debate is, what does it mean that the 10-year Treasury rate is at whatever level it is, such that it won't budge even though we think the economy is overheated? Why isn't the 10-year rate sort of consistent with that? And that probably will be a source of a lot of discussion.

CHAIR YELLEN. President Harker.

MR. HARKER. Just a quick question, back to the tax legislation. I'm curious if you've done any sensitivity analysis on the point that President Evans brought up before on the state contingency. I'm more worried about the business fixed investment, and I say that because,

anecdotally, survey work—there's no large firm in America, I believe, that's saying, "We're not investing because of the cost of capital."

Now, there may be an issue about deductibility and related matters, right, and the expensing of capital, and it may be that small and medium-sized enterprises have some constraint. But I don't hear anybody right now saying they're not investing because capital is too expensive. And so it raises the issue of the elasticity that's assumed and whether you've done any sensitivity analysis on that, because that drives, I would imagine, a fair amount of this growth. And what we're assuming, and what I've seen in multiple models—our model, the Kent Smetters model at University of Pennsylvania, and so forth—it doesn't jibe with what you're hearing from executives in terms of their decisionmaking.

MR. STEVENS. So maybe one way to sort of bound the question would be to just take out the business fixed investment piece.

MR. HARKER. Yes. So what happens then?

MR. STEVENS. If you do that over 20—basically you're taking two-thirds of the fiscal impetus piece and moving it out of the multiplier in the financial reaction. So, roughly speaking, maybe one-fourth to one-third of 1 percentage point off of that top-line number that we see would be my guess.

MR. HARKER. I'm just skeptical about that argument.

MR. WILCOX. I think your skepticism is fair. I would hasten to point out what probably doesn't need to be articulated, which is the vast uncertainty that surrounds all of these estimates. These numbers are really small that we're positing as the potential effects. I guess I find it plausible that while it might be difficult to identify a business executive in a survey who will confess that, with a yet greater financial incentive to invest in capital, I find it plausible that

there would be some executives at some corporations in the country who would, at the margin, invest a little more, and—

MR. HARKER. But the change in deductibility will have a larger effect, I believe. Right? I mean, that will have a much larger effect, because that's immediate, right? Assuming you don't do what you did before, which was make it retroactive—which meant assuming that we're going to affect people's behavior months ago. That was not a very good idea.

MR. WILCOX. It's a small effect. We're doing our level best to come at it with a degree of analytical rigor and be able to explain to you what we did and why we did it.

MR. HARKER. No, I appreciate the answer, it helps us in thinking out—

MR. WILCOX. There's no pretense here of knowing what the effect will be with any precision.

MR. STEVENS. One thing I'd add is that another channel we haven't written out an assumption regarding is, to the extent that this improves international competitiveness, we don't know anything about what firms that are trying to decide where to locate operations, if this will tip the balance for locating domestically or not.

CHAIR YELLEN. Okay. If there are no more questions, I suggest we begin the round and have a few presentations. Do you want to take a break? [No response] Okay. Let's have a couple of people start off, and then we'll take a coffee break. President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. With the unemployment rate currently at 4.1 percent and real GDP growth for the past three quarters of this year likely to exceed my estimate of potential growth of 1¾ percent by more than 1 percentage point, combined with the likelihood that real GDP growth will continue to exceed potential growth for several quarters due

to fiscal stimulus, I now expect the unemployment rate to fall 1 full percentage point below my estimate of the sustainable unemployment rate.

On the monetary policy side, the modest reductions in the balance sheet and the increases to date in the federal funds rate have not led to a tightening of overall financial conditions. The 10-year Treasury rate has fluctuated in a narrow range—low 2.4 percent, credit spreads have narrowed relative to still-low Treasury rates, and the stock market has continued its upward drive. Thus, our tightening to date appears to have been offset by other factors that have provided unexpected stimulus. In particular, a tax cut that is primarily focused on reducing corporate taxes has been perceived as potentially increasing after-tax earnings, which justifies the already-high P/E ratios and reduces the risk of credit problems as after-tax profitability increases.

As the probability of tax cuts for corporations rises, financial conditions have eased further. Such easing of financial conditions at this stage of the business cycle can result in an undesirable amount of additional stimulus. The various models we run show that, in theory, we can return gradually to a more sustainable unemployment rate. I am quite skeptical that we can engineer a full percentage point increase in the unemployment rate without causing a recession that results in much more significant costs to the economy.

In the event of a recession, our tools would be dangerously limited. With interest rates low and fiscal policy spent, we have little ammunition in reserve to fight a recession and could be faced with large misses on both elements of our mandate, as well as another prolonged period of low interest rates and all of the risks such an episode entails. In addition, as the unemployment rate eventually rises and the economy slows down, I expect that problems

associated with financial excesses that are often a side effect of very low interest rates will become more apparent.

One example of how a low interest rate policy encourages more risk-taking can be found in the leveraged loan market. Researchers at the Federal Reserve Bank of Boston have obtained a new data set developed by a fintech company that specializes in contract covenant visualization. Our guidance on leveraged lending was intended to discourage very highly levered loans—for example, ones that had debt in excess of six times earnings. The contracts have sidestepped that guidance by constraining initial underwriting to below six times earnings over the ability to raise the leverage after origination by making use of the covenant exceptions embedded in the contract. This type of regulatory arbitrage highlights why addressing the side effects on financial stability of a low interest rate environment may be difficult to offset with only regulatory changes.

While keeping rates low for long periods may induce financial stability concerns that we should continue to monitor, a major argument for removing monetary policy gradually is the uncertainty about whether inflation can pick up from its lower-than-expected readings over the past year. This concern is understandable. But I believe that, for several reasons, such concern is now moderating.

First, the annualized core PCE inflation rate over the past three months has been 1.9 percent, a rate substantially above the average over the past year. While the 3-month rate is, of course, quite volatile, we know that the 12-month rate of inflation was distorted by what looks to be temporary relative price changes earlier this year.

Second, while a number of wage and compensation measures have been rising gradually over the past several years, the employer costs for employee compensation—a series derived

from the ECI source data that allows employment weights to change over time—has risen more rapidly. This series is based on a firm-level survey and may be thought of as reflecting the wage bill rather than a wage rate and, consequently, may be a better measure of the actual labor cost borne by firms. Of course, if increases to the overall wage bill were accompanied by a significant rise in productivity—perhaps because employers were hiring more productive workers on the margin—this labor cost increase would be of less concern. But the aggregate productivity data suggest that that has not been the case, and, as a result, I expect that these increases will eventually translate into higher prices.

Third, if the unemployment rate falls as low as the 3.3 percent revised Tealbook forecast inclusive of the tax changes, it seems very likely that wages will begin to grow even faster. Federal Reserve Bank of Boston staff research suggests that the Phillips curve may become steeper as the unemployment gap turns that negative.

In light of the financial stability risks posed by maintaining low interest rates, the increasing tightness in the labor market, and the initial evidence that inflation is firming, my assessment of appropriate policy entails five ¼ point change increases over the course of 2018. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Evans.

MR. EVANS. Thank you, Madam Chair. The comments of my directors and other contacts about economic activity were generally upbeat, but there was still no talk of a meaningful pickup in inflationary pressures. Business demand for capital equipment appears to be strong. Caterpillar, for example, characterized sales last quarter as a "blowout." I also heard positive, though less emphatic, assessments given to me by other capital goods producers.

Consumer spending appears to remain on a solid footing. I heard a number of reports of strong retail sales heading into the holidays. Notably, my director, who is the CEO of Discover Credit, described his November numbers as the best in 10 years. My contacts generally characterized labor markets as healthy but not overheating.

I continue to hear the usual stories about labor shortages, but I did find it interesting that one of my directors, the CEO of a large manufacturing conglomerate, said that none of his businesses were having problems finding workers.

Manpower's CEO was positive about labor markets, both in the United States and abroad. He indicated that they were seeing modest increases in wages across most segments of the market. They were expecting some bigger wage gains in 2018 but no dramatic changes. He also noted that businesses are reacting to upward pressures on wages by increasingly using technology to achieve a better allocation of labor and to manage cost structures.

Similarly, while I heard some comments about higher material costs, no one pointed to any meaningful increase in price pressures. A manufacturing director I mentioned earlier indicated that they had experienced modest increases in input costs and that they had been able to pass these on to their customers. Still, he noted that input costs remain well below earlier peaks. Another commented that their steel costs had risen some, but not by an unexpected amount. Another director reported that, more generally, steelmakers had tried to increase prices in the second half of the year but were unable to make the higher prices stick.

With regard to the national outlook, like everyone, we were hustling this round to figure out an appropriate fiscal policy baseline. Like the Board staff, we used our off-the-shelf assumptions regarding the consumption effects of the personal tax cuts. The business side is a lot harder to figure out. Some not unreasonable assumptions imply big partial-equilibrium

effects on investment demand. On the other hand, my contacts still say that businesses are cautious about expanding capacity. There also may be supply constraints facing some of those who do want to boost spending.

In some sectors, such as heavy machinery, erosion in the supplier base or other capacity constraints, such as shortages of skilled workers, could limit new investment and perhaps boost wages and prices. And, of course, some of the demand may be satisfied by imports.

In the end, we wrote down aggregate real GDP effects that were pretty close to the Tealbook analysis. More broadly, the contour of our overall growth forecast is also similar to the Tealbook. We do, however, see a bit more near-term strength and activity. We also are conditioning on slightly different assumptions for potential output growth and the natural rate of unemployment. Our forecast ends up generating somewhat less resource pressure. We project that in 2020 the unemployment rate will be 1 percentage point below our natural-rate assumption, so about ½ percentage point less undershooting than in the Tealbook.

With regard to inflation, while the past couple of readings on core PCE inflation have been a little better, they really aren't anything to get excited about. I remain convinced that we have a lot of work left to achieve our target over the medium term. I still haven't seen anything to change my view that the underlying inflation trend is currently below 2 percent. I do not take comfort in the stability of some surveys of inflation expectations or in inflation breakevens over this past year. I believe their levels are too low.

Here our bank's DSGE model provides an interesting insight. One equation in the model links the Survey of Professional Forecasters' 10-year PCE inflation expectations to the model's 10-year forecast of inflation, and there's a measurement error. So this is an observation equation. This means that the SPF influences the DSGE model's inflation forecast, though the

two differ to the degree that other equations in the model may suggest an alternative inflation path. This is an estimated model, so past predictive power matters. The model works through these different implications accordingly.

At the moment, the model's inflation forecast for the next 10 years averages about 0.2 percentage point lower than that of the SPF. In other words, the model interprets the poor predictive power of the SPF for medium-term inflation over the past several years as a large measurement error, in the SPF's view, of expected inflation, and this reduces its influence on the forecast. Indeed, even though the model is hardwired to reach 2 percent PCE inflation in the steady state, it currently sees core PCE inflation at only 1.8 percent in 2020 and does not converge to 2 percent until we have all retired from the Federal Reserve. [Laughter] It's got slow dynamics. Of course, this DSGE perspective is just one input into our analysis. In our SEP submission, we have core PCE inflation gradually trending up about two-tenths a year to reach 2.1 percent in 2020. I guess I'm one of the six that overshoots. So it is not a lot different than the Tealbook.

However, to get there, we are conditioning on much more accommodative monetary policy. Still like that? [Laughter] No rate increase at this meeting, two hikes in 2018, and then a gradual path up to 3 percent in 2020. I'll talk more about the rationale behind my policy assumptions tomorrow. For now, let me just say that I see my SEP path as reflecting an important risk-management approach, one that better ensures that inflation expectations get moving back up and eventually to solidify symmetry around our 2 percent target. Reanchoring inflation expectations at 2 percent is clearly a necessary condition for achieving our inflation mandate. Thank you, Madam Chair.

CHAIR YELLEN. President Williams.

MR. WILLIAMS. Thank you, Madam Chair. The news on the economy is very cheery this holiday season. Incoming data since our previous meeting have mostly exceeded expectations in a way that leaves the year on a good note. Real GDP growth will likely come in close to 2.5 percent this year, buttressed by solid gains in consumer and business spending, supportive financial conditions, and an improving global economy. This pace is above the economy's potential growth rate, indicating that the economy has maintained solid momentum even as we reduce policy accommodation.

The underlying strength of the economy is especially clear in the labor market. We're on track to add about 2 million jobs this year, nearly twice the number needed to keep up with the trends in labor force growth. The strong job growth has driven down the unemployment rate to close to 4 percent and moved an array of other labor market indicators well past pre-recession levels.

As labor markets have tightened, nominal wage growth has also crept up about in line with what one would expect on the basis of underlying inflation and productivity growth, as indicated in the briefing chart we saw a little while ago. Of course, with the economic data meeting or beating expectations and financial conditions continuing to strengthen, it is useful to ask if the economic expansion has shifted into a higher gear. Now, on the basis of the available evidence, my tentative answer to this question at this time is "no." One sign that we're still on a moderate growth trajectory of around 2 percent is that gross domestic income, or GDI, has been growing much more slowly than GDP over the past year, almost 1 percentage point more slowly. Indeed, if you take the average of GDP and GDI, which I think is a reasonable way to approach these data when there's a discrepancy, the economy has only grown a little less than 2 percent over the past four quarters, roughly consistent with earlier years in the expansion. In addition,

my contacts see little evidence that the economy has shifted into a higher gear. They report that things feel roughly in balance, with little impetus to slow down or speed up.

Looking ahead, I expect real GDP growth to remain somewhat above potential GDP growth over the next few years. And I've revised up my projected real growth path to account for a little better momentum that the economy seems to be taking into next year and the expected fiscal stimulus coming from the tax overhaul.

On the topic of the tax cuts and their effect on the economy, I largely agree with the analysis by the Board staff. However, there are two factors that will likely attenuate the effects on aggregate spending—we've already had some discussion of this—relative to the estimates reported in the memos.

First, the research literature finds that fiscal multipliers and marginal propensities to consume depend on the stage of the business cycle. They tend to be smaller in expansions than they are in recessions, and that makes sense. In recessions, when spending is more likely to be liquidity constrained, consumers and businesses are more responsive to tax cuts, and in boom times, additional fiscal stimulus can crowd out private spending. In the current state of the economy, the effect of the cuts likely will fall short of the average effect computed from historical experience.

Second, since the election, tax cuts of some kind have been at least partially anticipated, and this has manifested itself in both higher stock prices and greater business confidence. So, therefore, a portion of the total effect of the tax overhaul is already in train and likely built into our baseline view of the economy, at least to some extent, implying less of a "delta" to the forecast than would be the case if the tax cuts were entirely unanticipated.

Taking these considerations into account, I expect the fiscal stimulus due to the tax package to boost the level of aggregate demand by about ¾ percentage point in total over the next three years, compared with the Board's estimate of a little bit more than 1 percentage point. My estimates of the effects on aggregate supply, interest rates, and the dollar are consistent with those of the Board staff memo.

Now, I'm being very specific about these numbers and the quantitative effects of these tax plans. As David Wilcox mentioned, it's worth remembering that major tax overhauls are not frequent, and estimates of their effects come with considerable uncertainty. We'll learn a lot more about the tax cuts as they unfold and as businesses and consumers respond.

Getting back to my numbers in my forecast, I expect real GDP to increase 2.2 percent next year and 1.8 percent in 2019, and this is an upward revision from my September SEP. I expect the labor market to keep strengthening, with the unemployment rate drifting down to 3.7 percent next year and remaining below 4 percent through 2019. In terms of monetary policy, my assumptions about the path of the funds rate is very close to the median path in the SEP that we saw earlier.

With regard to inflation, the latest price data have been encouraging. The incoming data are consistent with my view that much of the year's softness in inflation reflected transitory factors, and the dissipation of these temporary factors along with the hot labor market give me confidence that we will move gradually toward our 2 percent target, which I expect us to achieve in the next two years, well before my retirement from the Federal Reserve. [Laughter] Overall, I view the risks to this outlook as balanced and not unusually large relative to the past 20 years.

In preparation for this SEP round, I also revisited my assessments of the longer-term normal values of key macro variables—unemployment, growth and interest rates. First, I

marked down my estimate of the natural rate of unemployment, or *u**, from 4.8 percent to 4.7 percent, and this reflects just a modification tracking basically standard demographic adjustments and puts me in alignment with the CBO's estimates.

In terms of my thinking about this, I'm less convinced by the argument that inflation is running below the rate implied by our Phillips-curve models. One reason I'm less convinced by that is the presentation we had earlier—it suggested that, if you look at our models, whether of prices or wages, it's not obvious that we've been consistently making downside misses in our forecasts of inflation using our standard models.

The second is a point that many people have made and President Bullard emphasized. If the Phillips curve is really flat, then the implied estimates of the natural rate from these estimates are going to have enormous standard errors. Again, I'm getting very technical, but after President Evans's description of the DSGE model, I'm going to just go wild. [Laughter] I feel free and unleashed here. So the point is that you're basically trying to infer from this very small unemployment-gap slope of the Phillips curve what the natural rate is, and those estimates are going to be very imprecise. So my preference is to move away from looking at those kinds of estimates and really just look at other labor market indicators that we think, at least over history, have provided us with an accurate view of the degree of slack.

I mentioned that I've looked at a lot of these indicators that we've talked about many times, and Chair Yellen has focused on them in past speeches. My favorite, which I talk about a lot, is the one that comes from the Conference Board Survey, in which they ask people if it is easier or harder to get a job. And if you look at the most recent readings on that, they've consistently been right in alignment with what you'd expect if the amount of slack was

consistent with a 4.7 percent natural rate of unemployment. So I feel that the other indicators of labor market slack support a value of 4.7.

In terms of trend real GDP growth, or *g**, I was at the very low end, and I think I still am, of estimates of trend growth. I did raise my estimate from 1.5 percent to 1.7 percent long-term growth. One of the reasons was that I have reassessed my views of the underlying potential growth in the economy. In part, that reassessment comes from the model that Thomas Laubach and Kathryn Holston and I did that estimates potential output using a Kalman filter model, and those estimates have moved up a bit. In addition, I have taken some signal in terms of the behavior of medium-term potential output from taking on the tax cut package in a way similar to that described by the Board staff. So that raised my estimate of the long-run potential growth rate to 1.7 percent.

I've left my estimate of *r**, the natural rate of interest, at ½ percent. Again, I've been looking at all of the models that we use to analyze *r**, whether it's my model with Thomas or the HLW model, along with the term structure model that my colleagues at the Federal Reserve Bank of San Francisco developed. None of these models show any increase in the natural rate of interest through the third quarter of this year. So, basically, my view on what the natural rate of interest is has not changed.

And to go back to what was, I think, a good point made earlier, that with these tax cuts, there eventually has to be some counteracting forces down the road, whether they are cuts in government spending or tax increases. And until we really have a better idea of what those are, I'm going to stick with the view that the natural rate of interest really isn't likely to be boosted by putting this current set of tax cuts in place. I am SEP Respondent No. 8. Thank you.

CHAIR YELLEN. Thank you. President Bullard.

MR. BULLARD. Thank you, Madam Chair. The U.S. economy appears to be growing at a faster pace during the second half of 2017 than it did during the first half of the year. The first-half pace was close to 2 percent, whereas the second-half pace may be close to 3 percent. This is certainly welcome news, and it seems to be corroborated by anecdotal evidence coming from the Eighth District. Our business contacts are generally reporting solid revenue and profitability.

Contacts are concerned about their ability to locate qualified workers. But, for the most part, this seems not to translate directly into wage increases in excess of those observed in recent years. One idea offered by an Eighth District contact is that employers have adjusted work rules and other dimensions in recent years, especially with respect to paid time off, PTO, and flexible work hours.

While the economy is growing faster than expected today, I think it's best to recall that we are many years into the economic expansion, and that estimates of the potential growth rate for the U.S. economy are much lower today than they have been historically. The most likely scenario is that real GDP growth will slow from here to something closer to 2 percent. In that sense, for planning purposes, I think it is best, at this point, to assume we will remain in a low-growth regime over the forecast horizon.

There is some upside risk to this assessment. As we meet today, the Congress is putting the finishing touches on a new tax plan for the United States featuring important changes to the taxation of U.S. corporations. I'm sympathetic to the general aims of the tax package, and I think it will have a positive effect on the U.S. economy.

However, I'm probably more Ricardian in my thinking than most analysts, and, therefore, I think deficit-financed government spending is not very stimulative for real GDP growth. As I

see it, positive effects are more likely to come from supply-side improvements: chiefly, increased business investment that will feed back into improvements in productivity and, therefore, raise the trend growth rate of the economy. This would be an important development indeed, as even small effects on the trend growth rate matter a lot for the well-being of participants in the U.S. economy. A benchmark estimate might be that the tax package could improve trend growth from, say, 2.0 percent to 2.2 percent. While that would be quite important in economic terms, it would be hard to disentangle from quarter-to-quarter variations in real GDP growth rates.

I hold out some possibility that we could see much larger effects of the tax package. This possibility is based in part on my conversations with executives of large, multinational firms. In this scenario, the United States would experience an investment boom in the aftermath of the passage of the tax package, with correspondingly higher real GDP growth and larger productivity effects. This is not my base case, however, but is instead an upside risk.

Whether the economy grows more rapidly than expected may not be all that material for the discussion at this table. The inflation rate remains below target, has surprised to the downside in 2017, and is not expected to increase very materially over the forecast horizon. Any Phillips-curve effects coming from more or less rapid growth are apparently vanishingly small, perhaps zero.

The more important variable from a policy perspective is market-based inflation expectations, a kind of summary statistic for all that is happening in the U.S. economy with respect to price developments. Those expectations are generally low and suggest that markets do not believe the Committee will achieve our inflation target over the forecast horizon or, indeed,

even over the medium term. This suggests that current policy projections are too aggressive to give the Committee a reasonable chance to hit the inflation target in a meaningful time frame.

Let me turn now to comment on another aspect of current monetary policy projections that seems inconsistent with historical U.S. experience. As we know, the nominal Treasury yield curve has been flattening recently, mostly reflecting rising short-term yields in the face of relatively constant longer-term yields. Current trends, including the Committee's SEP, suggest that the yield curve will invert about one year from today. The staff projection includes a yield curve inversion lasting six years in the 2020s, as discussed on pages 8 and 9 of Tealbook A. My projection is more near term and would occur if the 10-year yields trade at current levels while the Committee follows through on dot-plot projections during 2018.

While yield curve inversion is not an infallible predictor of U.S. recession, it did successfully predict recessions over the past 30 years, without any false positives. Furthermore, a large research literature suggests that the yield curve may contain important information about the future of the U.S. economy. At a minimum, I think that this is an issue that has to be taken seriously by policymakers and financial market participants alike.

Of course, the yield curve may not invert. The Committee could be more cautious about raising the policy rate, which would be my preferred response. It could also be that the 10-year yield will begin to rise sometime in 2018 either because real yields rise or because expected inflation begins to rise.

Although these are certainly possibilities, they are not in my baseline curve. With the Committee being as "hawkish" as we are today and the short-run Phillips curve completely flat, I envision inflation expectations staying the same or even falling as a more likely possibility. And with respect to the real rate, the global situation, along with recent trends in 10-year TIPS yields,

seems to argue against rising longer-term real yields. Overall, I think we may have to devote careful attention to yield curve issues during 2018. Thank you, Madam Chair.

VICE CHAIRMAN DUDLEY. I have a quick question on that.

CHAIR YELLEN. Yes.

VICE CHAIRMAN DUDLEY. I don't understand why you think that the yield curve looks set to invert in a year. We don't write down our projections of the 10-year Treasury rate.

MR. BULLARD. I said, "on current trends." If you take the average of the 10-year rate over the past four years and assume it doesn't change—

VICE CHAIRMAN DUDLEY. So if the 10-year rate doesn't move—

MR. BULLARD. And it doesn't move.

VICE CHAIRMAN DUDLEY. Okay, but—

MR. BULLARD. And the SEP goes up.

VICE CHAIRMAN DUDLEY. But the market expects the 10-year rate to drift up, right?

MR. BULLARD. I said, "on current trends."

VICE CHAIRMAN DUDLEY. Okay. If the 10-year rate doesn't move and short rates move up a bunch, you'll get an inverted yield curve. That's really what you're saying.

MR. BULLARD. Absolutely.

VICE CHAIRMAN DUDLEY. Okay.

MR. BULLARD. Yes.

VICE CHAIRMAN DUDLEY. I just want to be clear.

CHAIR YELLEN. Okay. I suggest we take a break. I think coffee is available. Why don't we say 20 minutes. We'll reconvene at 3:20.

[Coffee break]

CHAIR YELLEN. Okay. Let's get started again and go to President Mester.

MS. MESTER. Thank you, Madam Chair. Reports received from contacts are consistent with continued moderate growth in the Fourth District. The December reading of the Cleveland Federal Reserve staff diffusion index measuring the percentage of business contacts reporting better versus worse conditions was 34 and essentially unchanged since our previous meeting. The average reading in 2017 was about 30 compared with under 10 in 2016.

Business contacts remain upbeat. Manufacturing contacts continue to report improving conditions consistent with the generally strong readings in the national and regional manufacturing surveys. Several District steel producers reported strong demand coming from the construction, automotive, appliance, and energy industries, much of it reflecting improving economic conditions rather than response to the hurricane. According to contacts, freight industry activity picked up over recent months and is higher than year-ago levels. They expect this to continue, perhaps a sign that Santa has decided to outsource some of his deliveries to keep up with demand. Indeed, retailers tell us that holiday sales have been stronger than anticipated.

The District labor market continues to tighten. The District unemployment rate stood at 5 percent in October, down slightly from readings over the prior three months, and back to the average levels seen over the past three years. The year-over-year growth in payroll jobs has moved up to an above-trend pace of 1 percent.

Responses to the system's special labor market survey show that the District's labor market is tighter than a year ago. For those firms actively hiring, nearly 80 percent reported they were increasing wages to attract workers in either most or some job categories, compared with 70 percent in last year's survey. There was a similar increase in the share of firms increasing wages for incumbent workers.

Now, some District contacts report that, despite higher labor costs, they don't expect to be able to raise prices because of the competitive environment. But other firms, mainly in the service sector, report that they have been able to increase prices due to increased demand. The Federal Reserve Bank of Cleveland staff's diffusion index of alpha prices is at a relatively high level and has been trending up since 2015.

For the national economy, incoming data suggest that the economy will enter 2018 with increased momentum, with growth over the second half of the year close to 3 percent, up from the 2 percent that has prevailed from 2015 through the first half of the year. Underlying economic fundamentals, including accommodative monetary policy and financial conditions, support growth above trend and continued strength in the labor market. Some type of tax package is very likely to pass, although the details are still being negotiated. The estimates make me expect the tax cuts will likely add ¼ to ½ percentage point to Q4-over-Q4 real GDP growth over the forecast horizon. This is a bit larger than what I had penciled into my earlier SEP submissions. There may also be some effect on the supply side of the economy if firms respond by increasing investment, but I think that's less certain. In view of the range of estimates out there, I view the effects of the tax package as an upside risk to my growth forecast. But beyond the forecast horizon, there are downside risks, because higher fiscal deficits could necessitate reduced government spending.

The basic contour of my outlook remains the same as in the September SEP, but I have edged up my growth forecast and edged down my unemployment forecast in light of incoming information. Over the next couple of years, I expect above-trend real GDP growth of around 2½ percent and the unemployment rate to move further below its longer-run rate.

Now, I have left my estimate of that longer-run rate at 4¾ percent in this round but acknowledge it could be lower. Nevertheless, in view of the strength we have already seen in labor markets, I expect the unemployment rate will move below 4 percent next year, well below most estimates of its longer-run level.

While job growth is well above trend, averaging about 170,000 jobs per month over the past 3, 6, and 12 months, the unemployment rate has fallen to its lowest level since December 2000, and the broader U-6 measures returned to the lows seen in the previous expansion.

Now, in light of the strength in the labor markets, one might have expected to see stronger wage and compensation growth. Both have moved up since 2012, and some measures, including the ECI, have picked up this year. In view of the low productivity growth we have seen over the expansion, I am not sure we should be that surprised by the slow acceleration in wages. A growing number of firms report raising wages and benefits, and both the job openings and quit rates in the JOLTS data are near or above their high points in the previous expansion. If this strength continues, more firms should be spurred to increase wages, and I would expect to see a further acceleration in compensation, albeit in line with productivity growth. Whether wage increases feed through to consumer price inflation remains to be seen. Inflation is lower than it was earlier in the year and is below our target of 2 percent, reflecting a variety of factors. Recently, readings have shown some stability. Year-over-year PCE inflation moved up to 1.6 percent in October from 1.4 percent this summer, and core PCE inflation has been 1.4 percent in three of the past four months.

Despite subdued inflation readings, long-run inflation expectations as measured by the Michigan survey, the Survey of Professional Forecasters, the Federal Reserve Bank of New York consumer survey, and the Cleveland Federal Reserve staff model have been broadly stated.

Reflecting the recent acceleration of inflation readings, reasonably well-anchored inflation expectations, and the current and projected strength in the real economy, my modal forecast has inflation gradually firming over the forecast horizon and reaching our 2 percent goal on a sustained basis in the first half of 2019.

Even if one accepts that the usual inflation dynamics are at work, there are risks to my projection and uncertainty about when inflation will return to goal. On the upside, inflation could strengthen more than projected if labor markets tighten more than expected or nonlinear Phillips-curve dynamics begin to kick in. There might also be an upside unexplained increase in inflation. In empirical models, unexplained shocks—or structural markup shocks in the DSGE model—account for much of the historical variation in inflation. On the downside, continuing to underrun our inflation goal has the potential to undermine inflation expectations, making it considerably harder to raise inflation back to goal.

Now, another possibility is that there has been some fundamental change in inflation dynamics, and that low inflation will persist even if labor markets remain tight and growth remains above trend. Some estimates of trend inflation are below 2 percent. This includes a study coauthored by Federal Reserve Bank of Cleveland staff economist Todd Clark that estimates the PCE inflation trend rate to be about 1.7 percent currently. If we are in this situation, then it isn't clear to me that just leaving the funds rate at current levels will be enough to move inflation expectations, and thereby trend inflation, up to 2 percent on a sustained basis. It would seem to require other actions, such as forward guidance or a change in framework.

Now, conditional on my modal forecast, I am not suggesting we go there. I am merely pointing out that leaving the funds rate low for a long time would likely not address the problem and would be quite risky if it turns out we aren't in this low trend inflation environment. So,

taking into account my outlook and the risks to the outlook and taking into account the lags with which monetary policy affects the economy, I think it's prudent to continue on the path of gradually rising interest rates. The modal rate path in my projection is flatter than in the Tealbook but a tad steeper than the median path implied by a set of monetary policy rules that the Cleveland Reserve Bank maintains on its public website.

I view this gradual upward path as the best strategy for balancing the risk and sustaining the expansion. If we were to instead pursue a flat policy rate path and it turned out there was more momentum in the economy than we think, we could then have to make steeper increases in rates, which could endanger the expansion. Furthermore, leaving the policy rate low for long in the face of a strong macroeconomy could be fueling financial stability risks. These risks appear to be contained so far. There doesn't seem to be excessive leverage, and banks have relatively high levels of capital and liquid assets. However, commercial real estate valuations are lofty, and the combination of low market volatility and equity prices that appear high in relation to earnings, even accounting for low interest rates, suggests that financial stability risks may be building.

Finally, in my view, keeping rates flat in order to raise persistently low inflation is not likely to be effective and could exacerbate these other risks. On the other hand, even though labor markets are strong, there are some upside risks to growth. Pursuing a steeper path also entails risk. If we embark on a steeper path and inflation continues to be very soft, this could lead to an unanchoring of inflation expectations and possible loss of Federal Reserve credibility. So I continue to view the gradual upward path of rates as the best one to manage the risks on both sides, with the slope of that path depending on how economic conditions evolve. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Bostic.

MR. BOSTIC. Thank you, Madam Chair. It seems apparent that this will be the best year for real GDP growth since 2014. Our directors and business contacts continue to report a solid pace of activity and are generally optimistic about the year ahead. Although the sentiment that labor markets are tight and wage pressures are imminent persists, I hear few reports that an actual acceleration of wage growth is occurring. If there is any significant pressure on prices, we aren't hearing about it.

Consistent with the early data on sales, our retail contacts report that holiday season activity has been strong. This extends to the brick-and-mortar part of the market, though it is worth noting that, in that segment, "flat is the new up." I did receive a caution from several of our contacts that last year's holiday sales got off to a fast start as well, only to stall in the final two weeks before Christmas. The view seems to be that the growing influence of cybershopping has affected the timing of the typical consumer's spending, making early returns somewhat harder to read.

Much like everyone else, our focus this cycle was on attempting to dig into the details of the pending tax changes to get a deeper understanding of what they imply for the outlook. Since the previous FOMC meeting, we have had two surveys in the field—our Business Inflation Expectations survey of businesses in the Sixth District and a decisionmaker survey, which is a joint national survey conducted by the Federal Reserve Bank of Atlanta, Stanford University, and the University of Chicago. In both of these surveys, we asked firms how the proposed tax reform would affect their capital expenditure plans for 2018. In the Business Inflation Expectations, or BIE, survey, we also asked how tax reform would affect hiring plans. On business investment, roughly two-thirds of respondents to our national survey, which was in the

field after the House bill had been passed, indicated that the reform wouldn't affect their capital expenditures at all. Just 15 percent said that they would increase their capital spending by 10 percent or more, and those responses disproportionately came from smaller firms.

Similarly, in the responses to the hiring question in our BIE survey, the majority of firms indicated that tax reform would not change their plans. Here, too, positive responses were skewed in the direction of smaller firms. In the case of those businesses with more than 100 employees, almost 70 percent indicated that there would be no change in their hiring plans as a result of tax reform being passed.

The results of these surveys were reiterated in our in-person interviews with a diverse set of business leaders across the District and by our Atlanta and Branch office directors. Contacts generally indicated that cash repatriation and increased profits due to a reduced tax burden would likely go toward increasing cash balances or be spent on debt reduction or stock buybacks. Even among those who indicated that there would be some stimulative effect, many noted that the proposed tax changes would only serve to accelerate, not expand, the current plans. These findings are consistent with the comments earlier by President Harker, and I was wondering if you were looking at my notes. [Laughter]

As a result of this input, I am only marking in a modest boost to my projection's near-term real GDP growth profile. I recognize that the larger real GDP effect in the staff's analysis comes in part from the labor supply response associated with individual tax provisions. I'm not quite ready to take that kind of response on board. As an example of why I'm reluctant, I would cite the fact that, among individuals who earn incomes under $40,000, whose labor supply response to a tax cut I would expect to be the strongest, the CBO and Joint Committee on

Taxation simulations suggest that there will actually be increasing tax burdens over time. For now, I am treating a breakout of tax-reform-related growth as an upside risk to my outlook.

I should note that this modest near-term bump due to tax reform is in the context of a small downward revision in my projection of longer-run growth. My new projection is in line with the staff's longer-run growth projection. But, as I noted, I am not taking on board the staff's near-term rise in potential. That said, I have also marked down my estimate of the natural rate of unemployment since our previous submission round. This judgment is, in part, pragmatic, reflecting the dearth of wage and price pressures amid already high labor utilization rates. The other part owes to a reassessment of the effect of the demographic and technological changes on the labor market that appear to have lowered frictional unemployment.

I have been somewhat encouraged that the past couple of inflation data reports have come in a bit stronger than what we saw earlier this year. My modal expectation is still that inflation will converge to target by the end of next year. But, as I said last time, that is an article of faith. I will have more to say about this in tomorrow's policy round. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Harker.

MR. HARKER. Thank you, Madam Chair. Over the intermeeting period, the Third District continued to grow at a modest pace, with that growth being rather broadly based. The labor market remains healthy, consumers and firms continue to be optimistic, and only our housing sector appears to lack any steam.

Employment growth has slowed a bit, and the region's unemployment rate remains at 4.8 percent. However, initial claims are trending down, and firms indicate that it is increasingly difficult to find workers. Employment growth continues to be robust in mining and construction, eds and meds, and leisure and hospitality.

Warehousing and storage is interesting. While it's still small, it's a growing share of employment, displaying 14 percent growth over the past year. Its share of employment in Pennsylvania, at 1.6 percent, ranks highest in the nation.

In a special Beige Book survey, 59 percent of the firms reported that they will be increasing employment over the next 12 months, while only 9 percent indicated they would be decreasing employment. And 58 percent indicated that there was a lack of qualified applicants, and 46 percent are raising wages for selected categories of jobs. However, only 19 percent are raising wages more broadly.

Manufacturing in our region continues to grow at a more rapid pace than its nonrecessionary average, and the employment subindex in our survey came in with a record high in November. As well, unfilled orders and delivery times are near historic highs, no doubt in part because of hurricane-related bottlenecks. Manufacturers remain upbeat, with planned capital spending near record highs, and, surprisingly, this planned activity appears not to be related to expected tax relief, consistent with what President Bostic just said, and I did not look at his notes. [Laughter]

Planned commercial construction activity is off the charts for our District. The combination of the ethane cracking facility in northwest Pennsylvania that I mentioned at our previous meeting and the Atlantic Sunrise expansion natural gas pipeline in Lebanon, Pennsylvania, will add over $8 billion in planned construction activity within the next five years. Now, to put that in perspective, that's like building eight new Major League Baseball stadiums or one Texas high school football stadium. [Laughter] Sorry, Rob.

Services are also growing, although not as robustly, but the employment index in our survey has rebounded as well. The only significant weakness in the region is that, other than in

Philadelphia, housing construction remains flat, and house prices are only growing at half the national rate.

In our recent survey of firms' inflation expectations, respondents expected inflation of all goods over the next year to rise by 2 percent and expect the price of their own products to increase by just a bit more. In general, nonmanufacturers had higher inflation expectations than manufacturers. Firms also anticipate modest wage growth of around 3 percent over the next year.

Now, for the national economy, the overall contour of my forecast is not too different from that of the staff, with the exception that I do not see the unemployment rate drifting quite so low. I anticipate unemployment bottoming out at around 3.8 percent next year, then gradually rising to 4.1 percent by the end of the forecast horizon. And I factored in roughly 0.3 percent added growth arising from fiscal stimulus over the next two years, yielding 2.4 percent growth next year and 2.2 percent in 2019.

I project both core and headline inflation rising to 1.8 percent in 2018 and then moving slightly above target at 2.2 percent in 2019 before returning to 2 percent in 2020. But my concern with my inflation projection remains elevated. We have seen a bit of strengthening in the inflation numbers over the past three months, but I am still in a "wait-and-see" mode. The low *r** environment continues to give me concerns over our ability to hit our inflation target on average, and that feature significantly informs my policy position. I'll return to that observation in my comments tomorrow. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Madam Chair. The 11th District economy continues to grow at a healthy rate due to a reacceleration in manufacturing activity and continued firming in

the energy sector. Texas job growth is expected to be approximately 2½ percent for 2017. This will be the highest rate of growth in jobs in three years, and, as expected, the effects of Hurricane Harvey on Texas employment growth have proven to be temporary.

The Texas unemployment rate is now down to 3.9 percent. This is the lowest level since the mid-'70s, and while we expect a modest slowing of Texas job growth in 2018 to approximately 2¼ percent, even this, we believe, should push the state's unemployment rate down to below 3½ percent.

In our surveys this month, in our bank's surveys, we specifically asked about labor shortages, wages, and prices. A majority of businesses report challenges hiring workers for skilled and, increasingly, unskilled positions. However, a follow-up with direct discussions suggests that, in terms of unskilled positions, the wage pressure is particularly at the low end, and I mean less than $15 an hour. Several discussions with contacts—and I think this is consistent with what President Evans said about some of his discussions—suggest that if you're a company that employs people and you pay $20 an hour or more and the job has benefits, there is an ample supply of workers and little price pressure. We'll do more work on this in the months ahead. Also, we found that if you're in a smaller city, and we have a number of smaller towns in the state of Texas, there are much more acute labor shortages that companies are dealing with. Not surprising.

In terms of what companies intend to do, a majority report ramping up recruiting efforts, and about half say they plan to increase wages. Respondents say they are hopeful about being able to pass wage increases through to prices, but direct discussions suggest that the jury on this is very much out.

In terms of energy, let me say a few words. As we've said for most of this year, we believe the global oil supply and demand are either in balance or moving close to balance. As you all know, OPEC cut production 1.8 million barrels a day. They agreed to that in December 2016, and these cuts were recently extended. That was expected. We believe that U.S. production is going to end the year at approximately 9.7 million barrels a day, which is an increase of approximately 800 million barrels a day for this year, and we believe the bulk of that increase came from the Permian Basin. We expect net U.S. production will grow by as much as 800,000 barrels a day in 2018, obviously depending on prices. We also believe that the recent turmoil in Saudi Arabia may be creating some upward pressure on energy prices.

Although we're in the high 50s on oil prices, we continue to believe we're still in a fragile equilibrium in the oil markets. We continue to expect a range of prices in the mid-40s to the high 50s, where we are right now, due to the flexibility and price sensitivity of shale production. That is, when prices get to the high 50s, our contacts and energy survey suggest drilling cap-ex increases. This may, in turn, have a damping effect ultimately on prices, and when prices decline to the mid- to low 40s, new drilling cap-ex activity will materially likely decrease.

Because of improved global growth, we are getting more confident that daily global demand for energy is approximately 1.5 million barrels a day. This growth, combined with the rapid decline curve characteristics of shale and the lack of long-lived project investment by major oil companies for the past several years, says to us still that, five to seven years from now, it is much more likely we're going to be in a global undersupply situation with energy price risks to the upside.

We would also note, one unusual thing that's happened since the hurricanes is the gap between Brent and West Texas Intermediate oil. And this is significant because retail gas prices tend to be priced off Brent, and there is now a wide gap between Brent and WTI. We believe this is likely due to, one, some residual effects of the hurricane, and, two, transportation bottlenecks and other issues, which we think are unlikely to persist, particularly as new pipeline capacity is added in the United States. But it's worth noting that these bottlenecks are likely having the effect of elevating refinery margins, certainly, and probably having some upward effects on gasoline prices in the United States. And we'd still be optimistic, on the basis of conversations with our contacts, that some of this gap will trail off in the months ahead into the first two quarters of 2018.

Regarding the national forecast, our bank's economists were expecting 2½ percent growth for 2017. And, yes, in part because of the tax package, we've marked up our growth for 2018 so that we'll have similar rates of growth to what we had in '17 in our forecast. We also expect growth rates to tail off and move below 2 percent by 2020, as do many of you. Better business investment, solid global growth—both provide underpinning to our forecast, as does the expectation of solid household balance sheets and consumer demand.

Expected growth is going to be sufficient to drive the unemployment rate, we believe, below 4 percent this year and well below that in the medium term, as with corresponding improvements in the U-6 measures of labor utilization. By the way, the Federal Reserve Bank of Dallas is number 9 in the SEP responses.

It is our base-case expectation that inflation will gradually firm during 2018, and, in the medium term, we still believe our base case is that we'll reach 2 percent. Again, as President Bostic said, this is a bit of an article of faith. We are cognizant that when the March 2017

numbers drop out of the trailing 12-month measures, that will also give a little bit of a boost, and we think we'll see a gradual improvement in the 12-month Federal Reserve Bank of Dallas trimmed mean inflation rate, which now stands at 1.6 percent.

We, however, are cognizant that because of the structural headwinds of technology-enabled disruption and, to a lesser extent, globalization, progress may be slower and more uneven than our base-case forecast. However, it is clear to us that cyclical pressures are likely building. To reinforce this point, though, about the headwinds, our direct discussions with business contacts continue to suggest that business pricing power is being increasingly challenged and product and service gross margins are under pressure.

I've talked to many of you about this, and we've agreed that disruption is not new. But partly on the basis of our conversations with contacts, I think the advent of the Internet—the power and ubiquity of powerful computing power—has likely changed the dynamic, so that companies increasingly are seeking to improve gross margins as well as operating profit margins by investing in technology that allows them to replace people and improve productivity. It is also clear from our discussions that the barriers to entry to being a disruptor are much lower than they've been historically.

Our own sense on the basis of discussions is that the corporate tax cuts and expensing of cap-ex will only intensify these trends, and that's what we're hearing from companies we speak with. It is also clear that companies are increasingly looking to merger activity as a way to lower costs, increase scale, and bolster operating margins. Investment in IT has never been more important for maintaining viability for most businesses, and many businesses we speak to have concluded they simply need more scale to afford this expenditure.

Record levels of mergers and acquisitions are being motivated by a desire to deal with current and anticipated levels of disruption; desire for more scale to improve gross margin expenditures and expenditures below the gross margin level; desire to combat new models for selling and distributing products and services; and a desire to be earlier rather than later, to be as preemptive as possible in taking actions that allow the company to be more competitive and potentially survive. And the lesson companies are learning is, if you wait too long to take actions, you may not survive.

Last comment. Our discussions lead us to believe the effect of disruption on the U.S. workforce is significant. In particular, companies we speak to certainly believe—and we observe them becoming—more productive. The issue is, what's happening to the productivity of workers who are seeing their jobs either restructured or eliminated? These issues clearly are more sensitive to structural reforms than they are to monetary policy, but there's no question that, increasingly, improved early childhood literacy, improved college readiness, and improved workforce development are becoming more and more essential. If the United States is going to find ways to improve productivity, we need to improve along these measures. There's no easy fix here. This will take years. But the measures we observe suggest the United States is lagging, and it's certainly lagging behind our global competitors. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Quarles.

MR. QUARLES. Thank you, Madam Chair. The economy continues to perform well. Growth in the second half has shown a solid pickup. The reports received from the various Districts that have reported so far have obviously, anecdotally, been even stronger than the numbers would show. The labor market remains strong. Unemployment in October and November has been running close to its low at the beginning of this millennium. With all of the

caveats that the staff had regarding their experimental job growth series, nonetheless, that is evidence that job growth may even have been somewhat higher. And if we hadn't had some stabilization in the labor participation rate over the past period, the unemployment rate would be even lower than we are currently seeing.

Recent data on inflation have turned out to be a touch stronger than expected—still lower than we would want, but the recent data are consistent with my view that it is too early to give up on our established framework for understanding inflation. I'd characterize recent weakness as a surprise that should be expected to fade, rather than a mystery that necessitates a complete reexamination of macroeconomics. [Laughter]

I think that growth will remain relatively strong next year, in part supported by the tax package that's working its way through the Congress. That should provide a boost to real GDP growth both in the near term, by pushing up aggregate demand, and in the longer run, as increased investment and higher labor force participation will contribute to stronger potential GDP growth. But as more workers are drawn into or remain in the labor force, I'd expect the tax cuts to have only a small effect on the unemployment rate and, with the expected increase in the productive capacity of the economy, only a muted effect on inflation.

Although, in particular, I think the effect of the tax cuts on capital expenditure could be a bit more pronounced than I think some others are expecting, on the basis of the comments that we've heard so far. Investment has been fairly robust this year, but we are coming out of an extended period of particularly sluggish investment demand. So there may be a bit more room for growth along this dimension than the staff analysis suggests.

I want to flag—not because I necessarily disagree, but just because I want to flag what the staff projects—that I do think there's a very high level of uncertainty about what the

consequences of the change in the bill in the pass-through tax rate are going to be. We have very little experience with extremely significant tax reform packages, but we have virtually no experience with changing the pass-through rate.

I think that the structure of business has changed more than people are aware of as—legally, what is done through corporations versus what is done through pass-throughs. There has been a significant change, particularly over the course of the past 15 years, in how significant parts of the economy are legally structured. The ability to change your structure, if that changes, is particularly strong. So I think the potential for both unexpected magnitude of predicted effects and unexpected effects coming from the change in the pass-through rate are particularly strong.

The box in the Tealbook on the inversion of the yield curve in the staff forecast provides an extremely coherent explanation of why the staff forecasts an inverted yield curve. But it still left—for me, at least—unanswered questions about the consequences of the inversion on the forecast. Those are as important to me as they are for Presidents Kaplan and Bullard, and I don't know whether that's because in the staff's framework, the slope of the yield curve has no implications for the forecast. In my view, you know, if we're predicting that the yield curve will remain inverted until my daughter in middle school has almost graduated from college, that would have very negative effects on bank profitability.

And has the staff incorporated any effect of that hit to the profitability of the financial sector into their assessment of the outlook, or even in relation to financial stability? More generally, I would argue that in formulating monetary policy and the economic forecasts that support that policy, it is important that we take account of the role that the financial sector plays in transmitting our actions to the broader economy. And six years of an inverted yield curve would have, I think, a significant consequence for the transmission mechanism that I'm not

certain has really been factored into the outlook of the staff. And that thought is independent of how much weight you put on the staff forecast of an inverted yield curve, which I would simply note, in closing, is importantly premised on a federal funds rate path that is far steeper than is actually projected in the SEP.

CHAIR YELLEN. Thank you. President George.

MS. GEORGE. Thank you, Madam Chair. Our District contacts remain optimistic, expecting hiring to strengthen in the coming months across most job categories. Reports also point to firms increasingly raising wages to attract entry-level workers, then facing pressure to raise wages for other staff. District manufacturing activity continues to show expansion, and the region's exports increased significantly this year, driven by demand for ag products. Activity in the service sector also remains solid, and District housing market indicators are steady. With the recent increase in oil prices, we've seen more drilling activity and improved optimism among businesses connected to the energy sector.

The District's ag sector, however, continues to face challenges due to weak farm incomes and low commodity prices. Since our previous meeting, our contacts are reporting growing concern about the prospects for renegotiation of trade agreements, as exports make up a large share of total farm income. In particular, Canada and Mexico appear to be exploring stronger bilateral trade agreements with other countries, including some that would represent increased competition for U.S. ag exports.

With respect to the national economy, I made some modest adjustments to my outlook for the economy to take on board, for the first time, the implications of fiscal policy. While some uncertainty remains about the underlying details of the potential tax changes, it does seem likely that we will see changes affecting household and business taxes. As a result, my forecast

reflects these effects, with modest increases in output growth, slight declines in the unemployment rate over the next three years, and only a negligible effect on inflation.

With the economy projected to grow at an above-trend rate over the next three years and further modest declines in the unemployment rate compared with my previous SEP, I expect growth to moderate back to its trend rate in 2021 and for the unemployment rate to bottom out at about 3.8 percent. In light of this stronger outlook for the real economy, I've kept four rate increases for next year and penciled in an additional increase in 2019.

Data released during the intermeeting period continue to suggest that the economy is growing at a healthy above-trend rate. The disruptions in employment growth following the hurricanes have been smaller than expected, and, importantly, the most recent reading on third-quarter GDP suggests robust spending by businesses on new equipment. Labor market indicators show few signs of remaining slack. The unemployment rate is lower than any time during the previous expansion, and broader measures of slack, such as the percentage of prime-age workers who want a job but are not in the labor force, are near their pre-recession levels. High levels of consumer confidence and continued modest wage gains should continue to support household spending in the period ahead.

Across all income groups, the University of Michigan consumer confidence measure is either at or above its pre-recession level. In addition, expected wage growth continues to rise for all income groups. Although these expectations of future income increases remain somewhat modest, I find them consistent with slow growth in labor productivity.

Inflation, of course, remains low and stable, with more recent readings moving up. Over the past three months, core PCE inflation has risen at an annualized rate of 1.9 percent, supported by housing services inflation, which has trended higher to an annualized rate of about 3½ percent

over the past six months. And nonpetroleum import prices, which tend to lead changes in core goods prices, have started to rise over the past year.

My staff looked at the effects of the weak inflation readings earlier this year on longer-term inflation expectations. Using the most recent data issued by the Survey of Professional Forecasters, they found that most forecasters did revise down their core PCE inflation forecast for 2018, suggesting that they expected that weaker inflation readings could persist. Yet despite this downward revision for next year, these same forecasters have not, on average, measurably lowered their five-year, five-year-forward inflation forecast. Specifically, my staff found no significant statistical relationship between changes in the forecasters' 2018 inflation forecast and changes in their five-year, five-year-forward forecast. This finding gives me some comfort that longer-term inflation expectations look to have remained anchored despite weaker-than-expected inflation readings earlier this year.

Finally, I, like others, appreciated the Tealbook box on the implications of a flattening yield curve. Recent research by my staff suggests two additional factors to those highlighted in the Tealbook. One is related to the gradual approach to policy normalization, and the other is related to the introduction of a policy rate path in the SEP. While our statements have provided transparency about expected future policy actions, my staff's analysis shows that the communication has tended to lower term premiums in longer-term bond yields. Likewise, the introduction of the federal funds rate forecast in the SEP coincided with a significant decline in uncertainty about future policy rates.

Currently, the market-implied uncertainty for one-year-ahead policy rates is about half the average level seen during the 2004–07 tightening cycle, which, according to my staff's research, would imply much lower term premiums. It's also likely that a large balance sheet

continues to put downward pressure on long-term interest rates. If, however, long-term rates remain unresponsive to further increases in the funds rate, we will certainly need to evaluate our policy rate path and perhaps also our balance sheet normalization strategy, considering the implications of an inverted yield curve for financial conditions and intermediation. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Acting President Mullinix.

MR. MULLINIX. Thank you, Madam Chair. I'd like to begin by thanking the staff for their helpful memos on tax cut effects and the updated Tealbook forecast. Now, I acknowledge the difficulty that comes with estimating such effects, but nonetheless, I agree with the staff that the growth effects are likely to be small and temporary. In fact, in our submission, the projected effects of the tax cut are smaller than in the updated Tealbook forecast.

Our view is that real GDP growth will be higher by 0.1 percent in each year from 2018 through 2020. In addition, I think it fair to be concerned about risks to the medium- to longer-term outlook arising from the higher path for the stock of government debt potentially leading to materially higher long-term interest rates. These higher rates could offset some or all of the positive supply-side effects of the tax cuts.

With GDP growth above trend in our projection, labor markets should tighten further. Information coming from our District, with unemployment running at 4 percent, is consistent with that view. We continue to hear from businesses that qualified labor is difficult to find and that it is increasingly difficult to meet customer orders as a result. For example, several executives in the trucking business report that labor shortages limit their ability to expand activity. In fact, they cannot use all of their fleet. In fact, some of their trucks sit idle because

they cannot find or retain qualified drivers despite raising their wages since 2015 by up to 30 percent.

Our staffing agency contacts inform us that the problem is broader and is being experienced across a number of occupations. After returning from an HR conference, a regional president of a national staffing firm reported that everyone was saying the same thing: "We can't find workers." The increasing difficulty of finding qualified workers also shows up in our hiring survey. In response to this, the number of firms that are raising their starting wages, mainly for specific jobs, has increased again this year. A notable difference to previous years' surveys is that more firms are now reporting that they raise wages for existing employees also. Across the board, our contacts and our staff support the need, and President Kaplan's call, for heightened emphasis and focus on workforce development.

Finally, our inflation projection is 1.9 percent next year for both headline and core inflation. I would note that the latest reading on core inflation is consistent with the view I've heard from many of you that the low monthly rates of inflation we observed earlier this year are likely to prove temporary. Accordingly, with labor markets tightening further and with fiscal stimulus kicking in, I believe that inflation is likely to rise a little more rapidly than the Tealbook expects. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kashkari.

MR. KASHKARI. Thank you, Madam Chair. With regard to the local economy, the labor markets for the Ninth District continue to be strong. In October, unemployment for Minnesota was 3.3 percent and only 2.3 percent for the Minneapolis–St. Paul metro area. Average hourly earnings growth remains strong in Minnesota, rising at about a 4½ percent pace for the state and a 5 percent pace for Minneapolis–St. Paul. Nonetheless, there are modest

pricing pressures. At the December retail polls, all respondents reported final prices for their products increased 3 percent or less over the past year.

In the national economy, there is continued moderate growth. It may just be noise, but we saw an uptick in productivity, 1½ percent year-over-year from Q3. Consumers and firms do seem optimistic. Tax reform, as others have noted, now does seem likely to happen, and it should stimulate some investment and some additional employment. It might be expected to add inflationary pressure, but so far we've seen little visible response of inflation expectations.

For the labor market, we continue to see strong job growth nationally, which is very welcome. Ongoing job gains have significantly narrowed racial and gender disparities in employment and unemployment rates. For example, unemployment rates for African Americans and Hispanics are now below their pre-recession levels. Labor force participation rates have also grown significantly in recent years, especially for women and for African Americans. It's becoming clear that the Great Recession had a large effect on labor force participation dynamics. People were slow to leave the labor force when things got bad, and now that the labor market is healthy, they are slowly coming back. Part of this slow-moving cyclical pattern likely reflects a gradual process of first more and then fewer people applying for disability benefits.

Most importantly for me, there's no evidence of wage pressures building yet. Average hourly earnings are stable at around 2½ percent over the past two years. The employment cost index is also rising at a modest 2½ percent annual rate. Adjusted for the BLS estimate of labor productivity growth of 1½ percent over the past year, labor costs are growing only around 1 percent, not likely to generate much cost-push inflation. Continued strong job growth coupled with a lack of wage growth is hard to reconcile with the idea that we're at maximum employment. So there's potentially room for further LFP growth.

You know, one anecdote others have commented on—I always do this. I asked businesses, "Are you able to find workers?" Most often, they say, "No, we can't find workers." My next question is always, "Are you raising wages?" Usually, "No, we're not raising wages." But to the extent they are, it's low-end, entry-level workers. The third question I started asking businesses is, "Tell me when you can remember when it was easy to find workers. When were we not in this environment?" The answer I get most often is, "2009 and 2010." And that's a reminder for me that we're in a market economy. Prices are going to adjust until demand and supply meet, and when is the environment that businesses are not going to be complaining? When we have massive labor oversupply. It seems like in every other state of the economy, they're probably going to be complaining that they can't find workers at the price that they want. And so to me it always goes back to, let's look at the price as a very important signal on where supply and demand are.

Now, the core 12-month PCE inflation rate remains low at 1.45 percent on a 12-month basis. This is a large shortfall relative to our target of 2 percent. I agree the October number was stronger, but one month is not much of a signal about trend inflation. Interestingly, the 10-year Treasury yield actually fell on the October CPI announcement. Measures of inflation expectations remain low. Market- and survey-based measures are little changed since our previous meeting, despite stronger monthly numbers and despite the surprising news on tax reform. I would have thought that you'd see survey- or market-based measures move on that.

Globally, inflation continues to run low. We talked about it with the staff. Core inflation is stable at around 1 percent in advanced foreign economies.

With regard to financial indicators, the stock market remains strong, in my view, reflecting in part low long-term interest rate assumptions and expectations of corporate tax cuts.

Now, just to build on what President Bullard was saying about the yield curve flattening with the higher 2-year yields but no upward movement at the long end, the 10-year–2-year yield spread is now only 58 basis points, the lowest since 2007. I appreciate the commentary in the Tealbook about the yield curve, and I accept the fact that it may be "apples and oranges" to compare where the term premium is today with its pattern in past cycles. But I do think there's information contained in the fact that we're raising rates, that this new tax reform is now likely to pass, and the long end isn't moving. That tells me that markets are either pricing in lower *r** or they're pricing in low or potentially falling inflation expectations. Either of these is information that I think we should take seriously as we think about the future path of policy.

In summary, the economy is performing well, though inflation remains significantly below target. In my judgment, we've likely underestimated labor market slack and continue to do so. Persistent weak inflation and weak inflation expectations are reinforcing each other. Past tight monetary policy and expectations of continued tightening are adding to this. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Brainard.

MS. BRAINARD. Thank you, Madam Chair. Since our previous meeting, incoming data have done little to resolve the disconnect between the strong labor market and economic activity on the one hand and stubbornly soft inflation and nominal wage growth on the other. However, the high likelihood of sizable fiscal stimulus, coming at a time when the economy is already in the vicinity of full employment, represents a material change to my outlook.

With regard to growth, underlying momentum remains robust. In particular, business spending on equipment and intangibles is projected to increase at an 8.5 percent annual rate in the second half of the year, contributing 0.8 percentage point to overall GDP growth. This is a

very sharp contrast to last year, when it flatlined in response to earlier oil and foreign shocks. Consumer sentiment remains buoyant, and personal consumption expenditures should continue to reflect strength in the job market and in household balance sheets.

The momentum here at home is bolstered by a synchronized expansion abroad, which is a welcome shift from the strong headwinds that emanated from abroad in previous years. Global expansion looks set to remain on a solid track in coming quarters, albeit with some moderation after the very rapid increases we saw earlier in the year.

Despite the sustained improvements in activity and labor markets, Japan and the euro area are still falling well short of their inflation objectives. As a consequence, monetary authorities have been at pains to emphasize that policy is set to remain accommodative for an extended period. This suggests some risk of an appreciation of the dollar, which could weigh on achievement of the Committee's inflation objective. So far, however, we've instead seen some further weakening of the dollar.

Adjusted for trade shares, the dollar's depreciated about ½ percent since our previous meeting and about 6 percent so far this year, partially unwinding the earlier more than 20 percent appreciation we had seen over the previous two years. This is also reflected in financial conditions that remain very accommodative by historical standards—a prominent theme in my discussions with market participants.

Equity prices are up nearly 3 percent since our meeting and 18 percent so far this year. Corporate bond spreads remain below longer-run averages, especially in the case of high-yield bonds, for which spreads are near historical lows.

Although the flattening of the yield curve since the outset of the year has attracted a lot of attention, the market participants I've spoken with attribute it to a very low inflation risk

premium and a low level of the long-run neutral interest rate, along with strong global demand for long-duration fixed-income assets at a time of rising shorter-term rates. As a result, they didn't see the flattening as a signal of rising recession risk, in contrast to the past tightening cycles, but I agree with Presidents Bullard and Kaplan and George—and, I think, President Kashkari and Governor Quarles—that this bears careful monitoring.

With regard to our policy objectives, the numbers on payroll employment released last week suggest momentum continues at a solid pace, smoothing through storm damage. The unemployment rate remained flat at 4.1 percent. Other margins of slack continued to tighten, and participation held flat at levels that exceed earlier estimates of its trend. Overall, the prime-age employment-to-population ratio remains 1 percentage point below the peak it reached in early 2007. Improvements can be seen across all demographic groups, including those that traditionally face challenges. This development is especially welcome.

Nonetheless, the latest data provide little indication that a tighter labor market is feeding through to an acceleration in wages. The latest reading on average hourly earnings for November amounts to a 2.5 percent increase over the past 12 months compared with a similar amount over the preceding 12 months.

This disconnect is even greater with respect to price inflation more broadly. Over the 12 months through October, core PCE price inflation was only 1.4 percent, ½ percentage point less than the preceding 12 months, when unemployment fell ½ percentage point at levels that many judged to be at or beyond full employment. We'll receive key information on consumer prices for November tomorrow.

As we look over the past five years, core inflation has systematically fallen short of our 2 percent objective. While transitory factors have played some role this year, various empirical

analyses conclude that persistent factors are also at play. In particular, a variety of measures suggest that underlying inflation—the slow-moving trend that exerts a strong pull on wage and price setting behavior—has moved below its pre-crisis levels, contributing to the ongoing shortfall of inflation from our objective. That conclusion is suggested by estimates using time-series models, longer-run expectations given in surveys, and market-based measures of inflation compensation.

To take just a couple of examples, the Federal Reserve Bank of Cleveland's 10-year inflation expectations measure is down a bit more than ½ percentage point from its pre-crisis level, and the latest readings in the Michigan consumer surveys continue to show inflation expectations at subdued levels, which is not contradicted by the New York Fed Survey of Consumer Expectations. Even the Survey of Professional Forecasters' latest 10-year projection of CPI inflation is lower than in the pre-crisis period.

With the Phillips curve widely estimated to be extremely flat, this step-down in underlying trend inflation makes it harder to achieve our inflation objective than before the crisis. And, at a time when the long-run equilibrium rate of interest is also estimated to be quite low, every ¼ point of additional buffer matters.

With that in mind, I want to finish by highlighting the likely shift in the stance of fiscal policy, which is the most significant change to my outlook since we last met. With the House and Senate tax bills now in conference, there's a substantial likelihood that a large deficit-financed tax cut will be enacted. In addition to a 1 percentage point increase in the projected deficit over the next few years and a 5 percentage point increase in the debt-to-GDP ratio, the staff estimates that a House–Senate compromise might boost growth about 0.3 percentage point

or 0.4 percentage point per year over the medium term, with about one-third of this coming from an increase in potential output.

Depending on whether a delay in the corporate rate cut relative to the immediate expensing of equipment makes it into the final version, the response could be a bit larger and more front-loaded, possibly presenting a small upside risk to the outlook. Of course, the point made earlier by President Harker—and, I think, also by President Williams—suggests risks in the other direction.

Overall, however, it's hard to know ex ante how much of an effect is likely to be seen in business cap-ex as opposed to, for instance, funding stock repurchases. Even so, with financial conditions highly accommodative, solid underlying momentum in domestic demand, and well-entrenched global growth, the prospect of sizable tax cuts should provide some additional impetus to demand and, in turn, labor utilization. Coming at a time when most observers put the economy at full employment, this should feed into the outlook for inflation and could provide support for a firming in inflation expectations, depending on how the public expects the Committee to respond. That, of course, is the subject for our discussion tomorrow. Thank you, Madam Chair.

CHAIR YELLEN. Thank you very much. Governor Powell.

MR. POWELL. Thank you, Madam Chair. The economy has continued to expand at an above-trend pace, with the available data pointing to growth of about 2½ percent this year. The unemployment rate has continued to fall more rapidly than expected, and inflation has remained below the 2 percent objective. Accommodative financial conditions have supported demand as the dollar has moved down over the course of the year, reversing some of its big move up in

2014 and ’15, and as equity prices have surged and credit spreads narrowed. My outlook has strengthened somewhat since our previous meeting, as I will discuss.

The labor market, by most indicators, suggests we are now at full employment. Indeed, the unemployment rate is now below all of our individual assessments of the natural rate. Surveys of business and household assessments of labor market conditions also appear consistent with an economy that is operating near full employment.

A couple of measures are sending more ambiguous signals. One is wage growth, which has remained relatively subdued although broadly in line with the pace of productivity growth. Another is prime-age labor force participation, which remains below pre-crisis levels, a shortfall that may reflect secular as well as cyclical factors.

The incoming data on inflation have tended to be disappointing this year, and I continue to concur with the staff’s assessment that transitory factors largely account for the decline in both overall and core rates, while I also realize that this is far from certain. In this regard, I take some signal from the incoming data on prices for September and October, which do suggest that inflation may be turning up, albeit just very, very gradually.

With regard to the outlook, with still-accommodative financial conditions, solid incoming data, and fiscal stimulus arriving, the economy seems poised for continued above-trend growth. I found the staff analysis of the likely economic effects of the emerging fiscal package to be helpful, and I have included similar effects in my forecast.

The current versions of the bill include tax cuts amounting to about 1 percent of GDP per year over the next several years, which should provide a moderate boost to demand. There should also be some positive supply-side effects, although these are likely to come in more

gradually. And, of course, there is still uncertainty regarding the final provisions of the bill and even greater uncertainty about its effects on the economy over time.

But above-trend growth of real GDP should lead to a further decline in the unemployment rate. My unemployment rate projection is between that of the median SEP path and the lower trajectory in the updated Tealbook forecast. This further tightening of labor market conditions gives me some comfort that inflation will stabilize around our 2 percent objective over the next couple of years.

I see two prominent risks to this outlook. The first is that we might be underestimating the degree of tightness ahead in the labor market. The second is that inflation might take longer than we anticipate to reach 2 percent on a sustained basis.

On the first risk, it's worth recalling that in five of the past six years, the unemployment rate has fallen more than the Tealbook had projected in the preceding December, with an average downside miss over the six years of 50 basis points. Now, that's not to say that what's past is prologue, although it may be, but rather that these things are inherently uncertain. And the pattern is similar for the SEP median forecasts over the period.

If growth is about as projected in the SEP, this experience does suggest that the unemployment rate could again surprise to the downside, declining into the mid- or even the low 3s, like the Tealbook path. In any case, holding all else equal, the median SEP path does implicitly embed the assumption of a meaningful uptick in labor force participation on top of the above-trend performance already assumed in the Tealbook, a similar acceleration in productivity growth, or both. These would all be highly desirable results but are far from assured.

And so, does it matter? You know, a significant sustained unemployment undershoot into the mid- or low 3s would have real benefits, such as better job matching, increased human

capital, and higher incomes. But there would also be risks. In particular, we could see an excessive buildup of inflationary pressures over time, reflecting either lags or nonlinearities in the Phillips curve. There may be no such reaction, but I say there are risks. And, of course, the natural rate of unemployment could be lower than current estimates, although it seems to me unlikely that it would be materially lower than 4.1 percent, today's level of unemployment.

But the labor market may not be as tight as it appears. And, as a result, the main other risk that we face is that we may remove accommodation too quickly, potentially aggravating the persistent shortfall in inflation. Indeed, as discussed at the past several meetings, the ongoing softness in inflation this year raises real concerns about its underlying trend. The challenge for the foreseeable future will be to appropriately balance these two risks, as we will discuss tomorrow. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you, Madam Chair. So, in New York, we're with everybody else. We continue to anticipate that the economy will grow at an above-trend pace in 2018. Consumer spending should be well supported by solid income gains and buoyant financial market conditions, and investment spending should continue to rise as businesses seek to economize on the ever-scarcer supply of labor. At the margin, the fiscal package should provide support to both of these sectors.

Now that a tax cut package looks highly likely, we have factored that into our modal economic forecast for the first time. That having been said, and despite its likely cost—$1.5 trillion over 10 years on a static basis, and much of that front-loaded—we don't see the package as having a strong effect on the economic growth trajectory, for several reasons. First is one that President Williams pointed out, that some of this is already built into expectations. But

beyond that, I think it's important to note that the incidence of the tax cuts falls mainly on the corporate sector and higher-income households. So that implies to me that much of the tax reductions are likely to be saved, not spent.

Second, the effects are likely to be further reduced because many of the provisions are temporary rather than permanent. So, although the provisions may ultimately be extended, I think the lack of clarity about whether that will actually occur should attenuate the effect.

In addition, with respect to the corporate sector, I don't judge investment spending as being very sensitive to the cost of capital. What's been interesting over the past decade or so is, we've had this very low interest rate environment. People we talked to in businesses about what their hurdle rate is said it hasn't changed at all. It's still around 15 percent. And I think if you actually look at the reduction in the effective tax rates for corporations, it's actually much smaller than the reduction in the actual statutory rate. People are estimating that the reduction in the effective corporate tax rate is about 4 percentage points. So I don't think that the reduction in corporate tax rates is going to have a large effect on capital spending.

The last thing I'd like to talk about is the fact that I think this legislation is also going to generate some frictional cost due to the fact that there are going to be large regional disparities in terms of the effect. For example, given the likely loss or significant reduction in the state and local income tax deduction for households and those in states with high income tax rates, they're going to be disadvantaged under the legislation. And I think this could, presumably, have consequences for people to live in these states or purchase housing in these states. You know, given the differential effect of the legislation, we probably have too much high-cost residential real estate in New York and California. And that suggests one potential adjustment path would

consist of lower real estate prices and weaker residential investment in those states over the medium term.

Lastly—I said I was done, but I'm not [laughter]—there is no free lunch. In other words, when I think about this tax legislation, I try to divide it into two pieces. There's the tax reform piece, a more efficient tax regime that can give us lasting benefits to growth, but then there's this fiscal stimulus piece, and on that part there's payback. There's no free lunch on that part. And I think it would be useful to go through this—once we get the legislation, to try to parse how much is tax reform, moving to a more efficient tax regime, versus how much is just fiscal stimulus, for which there's going to ultimately have to be a payback.

The thing I am particularly worried about is, as far as I can see, the United States is already on an unsustainable fiscal path even before this legislation, and this legislation just exacerbates that. So, on the basis of that piece, I'm anticipating over time that we're going to see the effect on—it's going to show up in interest rates and higher bond market term premiums. The markets today are completely relaxed about fiscal sustainability, but I don't think that condition is going to last over the longer term.

So putting it all together, we're bumping up our modal forecast of real GDP growth a couple of tenths of a percent in 2018 and in 2019, and we're pushing down our unemployment rate projections slightly. Compared with our September projection, our overall GDP forecast in 2018 goes up more, but that's mainly because we judged the economy as carrying a bit more forward momentum into the new year than we previously anticipated.

On the prices side, we continue to anticipate that inflation will move upward toward our 2 percent objective over the medium term. Sequentially, we've already seen, as others have noted,

a slight increase in core PCE inflation. I agree it's not much to hang your hat on, but it's better than the opposite outcome.

In addition, the labor market is tight, and this should translate into higher wage gains in the year ahead. People have looked at the relationship between wage gains and state unemployment rates, and it's not a strong relationship, but it certainly looks, on average, that states with lower unemployment rates actually do see higher nominal wage growth. So that tells me that the relationship between labor market stringency and nominal wage growth still remains intact. I take some signal from that, that there is actually a Phillips curve out there, and at some point we'll actually see that manifest itself.

I also expect that wage gains will ultimately feed through into prices, but I do want to acknowledge that the linkage appears to be quite different for goods versus services. Our staff has taken an analysis of this, and they find that, in the case of manufactured goods, prices do not appear to be sensitive to wage costs. So if wage cost goes up, it doesn't really flow through into manufactured good prices. In contrast, higher wages are associated with higher services prices. So that difference could, I think, reflect several factors. First, manufactured goods prices are probably determined globally rather than locally. Second, there remains significant excess capacity in U.S. manufacturing and elsewhere.

I think it's also very interesting—we're at a very tight labor market, but we actually have plenty of manufacturing capacity. The capacity utilization rate in October was 76.4 percent. That's 2 percentage points below its average over the past 44 years, starting in 1972. So there's a real asymmetry between the tightness of the labor market and the tightness of manufacturing capacity.

Also, for manufacturers' goods, there may be more scope for substituting capital for labor or for lowering labor costs by importing labor-intensive intermediate goods. If that were true, then this would tend to damp the pass-through of higher wage costs to manufacturers' goods prices.

Now, in terms of monetary policy, while the shortfall of inflation on a year-over-year basis from our 2 percent objective clearly pushes on the side of patience, I find that this is offset by a labor market that looks to be in the vicinity, or even beyond the vicinity, of full employment. In an outlook for continued above-trend growth, it should cause the labor market to tighten further, which continues to be supported, in turn, by very accommodative financial market conditions. It's noteworthy to me that by most measures, financial market conditions today are even easier than when we began to remove monetary policy accommodation in 2015.

Finally, I would give more weight to the recent inflation trend if I actually thought this was causing inflation expectations to decline further. Although inflation expectations do appear to have declined a few years ago, more recently I would judge the survey- and market-based measures as being broadly stable. If that wasn't the case, if they were falling right now, I would take a lot more signal from the fact that inflation is underperforming in relation to our 2 percent objective. In that vein, in the Federal Reserve Bank of New York's consumer expectations survey for November—which came out on Monday—the three-year median inflation expectations remain steady at 2.8 percent. So there's really no trend visible there. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Well, my thanks to everyone for a thoughtful discussion of the outlook and risks. Let me wrap up the round with a few comments on incoming data and recent fiscal and financial developments. On balance, recent readings on inflation and

employment have not materially altered my views about the outlook and appropriate policy. Although the 12-month measure of core inflation remains disquietingly low—well below our 2 percent objective—the recent monthly data have been consistent with the staff's expectation that inflation will pick up early next year once it's no longer held down by last March's exceptionally low reading.

This expectation is buttressed by the news received from the labor market. Payroll gains, rather than moderating further, have remained solid, on average, over the past three months at 170,000, well above the pace consistent with stabilizing the unemployment rate over time. In addition, the unemployment rate has fallen more than I anticipated back in September and, at 4.1 percent, now stands almost ½ percentage point below my assessment of its longer-run sustainable level.

Other utilization indicators, such as the broad U-6 measure, also point to a further noticeable tightening in labor market conditions, although wage gains, as many of you have emphasized, show only minimal upward drift. Finally, real GDP appears to have continued to expand somewhat faster than potential output in the second half of the year, suggesting that further declines in the unemployment rate in coming months are quite likely.

In light of these real-side developments as well as my assessment that inflation is currently being held down by factors whose influence will likely prove transitory, I remain reasonably confident that inflation will move back up to 2 percent over the next two or three years in the context of a strong labor market even if the recent price data haven't shown much progress toward this objective. For this reason, I consider it appropriate to take another step in reducing policy accommodation at this meeting. Furthermore, recent fiscal and financial developments suggest that a somewhat steeper path of the federal funds rate over the next few

years may be called for. My September SEP submission did not incorporate any new fiscal initiatives, in part because the prospects for one being enacted any time soon seemed relatively low. However, major changes to the tax code now appear to be in the offing.

Adjusting the outlook for the changes proposed in the House and Senate bills is difficult because the modifications under consideration by the Congress are complicated and have uncertain macroeconomic effects. In addition, important differences between the House and Senate bills have yet to be reconciled, so we do not yet know for certain what provisions actually will be enacted. Nevertheless, it seems likely that fiscal policy will provide notably more macroeconomic stimulus over the next few years than I previously anticipated.

As was discussed in the staff memo, the tax changes envisioned in the House and Senate bills would influence the medium-term outlook through several channels. Both bills would directly boost after-tax personal income materially over the next few years through various provisions. And although high-income households—who have, presumably, a low marginal propensity to spend—would see the bulk of the gains, consumer spending should be boosted modestly. Both bills would also reduce the corporate income tax rate to 20 percent, introduce full expensing for equipment, and modify other business tax provisions that would lower the cost of capital and increase corporate cash flow, thereby stimulating business investment. In addition to boosting aggregate demand, directly increased business investment would also boost real activity indirectly by modestly raising the capital stock and the level of potential output over the next few years, thereby increasing expected future income and sales and, hence, actual spending.

Theoretically, a reduction in personal tax rates could also boost potential output through an increase in labor supply, although I, too, am skeptical that the provisions under consideration would generate even the small effects assumed in the staff's analysis.

As the staff memo noted, lower corporate income taxes and a more favorable treatment of pass-through income should also stimulate household spending by raising asset valuations. Presumably, most of the boost to wealth coming from the proposed tax changes is already reflected in equity prices and helps explain their marked increase over the past year.

My September SEP submission had already factored in the spending implications, noted by President Williams and the Vice Chairman, of the increase in equity wealth up to that point. But I hadn't factored in the almost 7 percent rise in stock prices that's occurred since September. This latest increase, if it were to persist, would modestly boost consumer spending growth over the next few years, as households tend to adjust their spending gradually in response to an increase in net worth. As for other financial conditions, the changes in long-term yields and the exchange rate that have occurred since our September meeting have been small, and so they have only minor implications for the outlook.

In light of the additional stimulus arising from the proposed changes to fiscal policy and the recent increase in equity prices, I now anticipate that a modestly faster pace of policy tightening will be appropriate over the next several years in order to prevent the economy from overheating. Even so, my outlook for real activity is now somewhat stronger, on net, than in my previous SEP submission, with a level of real GDP in late 2020 up about ½ percent. I also anticipate that the unemployment rate will run a little bit below 4 percent over the next three years, about 0.2 percentage point below my previous forecast. My price outlook is unchanged, and I anticipate that inflation will move up to 2 percent over the next two or three years.

As I noted a few moments ago, considerable uncertainty attends any assessment of the medium-term macroeconomic effects of the changes to fiscal policy now apparently in train. On the one hand, with so much of the increase in after-tax income appearing likely to go to high-

income households, the boost to consumer spending over the next few years might turn out to be surprisingly small. Also, firms, which already have large reserves of liquidity available to invest, may prove unusually reluctant to increase their capital spending in response to tax cuts. On the other hand, some analysis suggests that the stimulus to business investment due to a lower cost of capital could be considerably larger than assumed in the staff's baseline estimates. If so, the medium-term demand and supply effects could be noticeably greater than they anticipate. In light of this uncertainty, the Committee may need to adjust its assessments of the outlook and of appropriate monetary policy appreciably over time as the actual macroeconomic effects of the tax changes emerge. Furthermore, fiscal policy will be only one of the factors shaping the outlook, and it may not prove to be one of the most important.

If the real neutral rate is currently close to zero, as some estimates suggest, then a few more increases in the federal funds rate should be sufficient to remove the policy accommodation still in place. Accordingly, if we raise the target range tomorrow and continue on a gradual tightening path next year, I would expect to see employment growth moderating over the course of the year, accompanied by a pickup in inflation. Under these conditions, perhaps three hikes in 2018 might be appropriate. Of course, if employment growth does not slow, then a faster pace of tightening would likely be appropriate, particularly if inflation moves up as expected. However, it's also essential that we continue to monitor inflation. And if inflation remains soft, particularly if employment growth moderates, then fewer rate increases might be called for. So, as always, appropriate policy will depend on the incoming data and their implications for the outlook.

So let me stop there and remind you that we will have a reception beginning at 5:00 p.m. downstairs in the atrium in honor of former Board Vice Chairman Fischer. Everyone here—all

participants and all of the staff attending this meeting—is invited to attend the reception. And we will convene tomorrow at 9:00 a.m. Thomas will then begin his monetary policy briefing. And we do get the CPI tomorrow morning, and David will give us an inflation update. And then we'll have the policy go-round, of course. So thanks very much, and we stand adjourned for now.

[Meeting recessed]

December 13 Session

CHAIR YELLEN. Good morning, everybody. Let's get started. David, would you like to lead off by discussing this morning's news?

MR. WILCOX.[4] Sure. We have a preliminary translation of the CPI into PCE space. It's just a few basis points shy of what we had been expecting. I don't have the detail in front of me that I normally would have later in the day, but the core CPI increased 12 basis points in November. For what it's worth, we'd been expecting 16 basis points. The published number will round to one-tenth. After translating it into the PCE price index and taking account of the PPI that we received yesterday, we estimate that the core PCE index increased 8 basis points in November relative to our expectation of 13 basis points. The top-line PCE index increased, we estimate, 24 basis points in November, 3 basis points shy of our expectation. On a 12-month basis, the core PCE index, we estimate, increased 1.5 percent in November. That rounds to the same figure that we had in the Tealbook projection.

I believe you all will be writing down Q4-over-Q4 numbers for 2017, and our own forecast for the core PCE index was 1.5 percent. That remains at 1.5 percent on the basis of this morning's news. The topline total PCE index we had forecast for Q4 over Q4 would be at 1.7 percent, and, again, that remains unchanged in light of this morning's release.

To the extent that we can tell on a very preliminary basis, it appears to be that the downward surprise, such as there was, was in the core goods area.

CHAIR YELLEN. Any questions for David? [No response] Okay. Seeing none, let me call on Thomas to deliver the policy briefing.

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

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

At the risk of precipitating President Kaplan's discussion about the yield spread, the focus of my briefing is going to be on that very topic. And I guess it's an understatement to say that several of you have remarked on the flattening of the yield curve since you began raising the federal funds rate two years ago—and especially since the beginning of this year. The light-green line in the upper-left panel shows the behavior of the yield spread between the 10-year Treasury note and the 3-month Treasury bill since the early 1970s. Although the spread has declined by almost 1 percentage point since the turn of the year, it is not unusually low by historical standards. A similar spread currently stands at about the 40th percentile of its distribution since 1971, as noted in a Tealbook box, and about ½ percentage point above the average historical level associated with the onset of recessions, shown by the light-green horizontal line.

That said, a number of commentators have asked what the narrowing of the yield spread might portend for the economy's ability to withstand further removal of monetary policy accommodation. From the perspective of the expectations hypothesis, an inverted yield curve implies that the current short-term interest rate exceeds the average level that investors expect to prevail over the next 10 years, provided term premiums are not negative. As the shaded bars in the panel highlight, since the early 1970s, a negative term spread has always been followed by a recession.

Many empirical studies have built on this regularity by using the term spread to predict recessions. As reported in the upper-right panel, when a regression that relates the spread to the event of the economy being in recession at any point over the next four quarters is used, the current level of the term spread implies a nearly 40 percent probability of such an event. As shown by the red line in the middle-left panel, this probability is up from about 15 percent since you began raising interest rates. Here I am showing the probability of the economy being in recession at any time during the next four quarters; the Tealbook box reported a substantially lower probability of being in a recession four quarters from now.

A substantial likelihood of a near-term recession seems at odds with ongoing robust employment gains, high levels of household and business confidence, expectations of somewhat more rapid economic growth following the anticipated passage of the tax package, and signals from stock prices and risk spreads. One possible way of resolving these different signals is to note that the relationship between the term spread and the business cycle may have changed as term premiums have declined. The dark-green line in the upper-left panel shows the term spread after subtracting the 10-year term premium, as estimated by the Kim-Wright model, from the 10-year yield to obtain a direct comparison between the current short-term rate and the component of the 10-year yield reflecting expected future short-term

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

rates. This adjusted term spread currently stands a full percentage point above the average level previously associated with the onset of recession, the dark-green horizontal line. As shown by the blue line in the middle-left panel, when this adjusted spread replaces the raw term spread in the recession probability model, the probability of a recession over the next four quarters is currently estimated to be very low. However, this model did not indicate as high a probability of recession in 2000 and, especially, in 2007 as the model using the unadjusted spread.

Term premium estimates are quite model dependent, and the expectations component of the 10-year yield derived from a term structure model different from the Kim-Wright model might produce a higher probability. An alternative approach is to combine the unadjusted term spread with other measures of financial conditions to assess the likelihood of near-term recession. A memo sent to the Committee in March 2016 noted that the excess bond premium developed by Simon Gilchrist and Egon Zakrajšek, shown in the middle-right panel, is a useful indicator because it tends to rise in the periods shortly before the onset of recessions, as investors demand higher compensation for bearing credit risk. This premium has declined notably following a spike in early 2016 and currently stands near the lower end of its historical range. As indicated by the green dashed line in the middle-left panel, the inclusion of both the unadjusted term spread and the excess bond premium in the regression model generates a probability of recession of around 7 percent.

As noted in the lower-left panel—and I'm afraid it becomes evident that I'm cribbing from Governor Brainard's notes—recent conversations with market participants do not reveal heightened concern regarding the decline in the term spread. Contacts attributed the compressed spread in large part to the continued low level of the 10-year yield, which in turn reflected not only a low expected longer-run value of the federal funds rate, but also a low inflation risk premium and persistent demand for duration from investors in an environment of low yields globally and low volatility. In light of these factors, several contacts expressed the view that the slope of the yield curve might not be as effective an indicator of recession risk as in previous economic cycles.

The lower-right panel turns to some key considerations for your policy decision at this meeting. In light of most indicators pointing to continued expansion, and with payroll gains still running at a pace consistent with further tightening in the labor market, you may see the economy as having sufficient momentum that another step toward removing policy accommodation is warranted at this meeting. Even though inflation remains low, you continue to see it approaching your objective over the next two years. As Bob Tetlow noted in his briefing, almost all of you expect that the tax package will boost economic growth modestly in the next couple of years. With the unemployment rate projected to decline well below your estimates of its longer-run normal level, you may see staying on a gradual path of removing policy accommodation as appropriate to balance the risks of continuing to miss your inflation objective and an overheated labor market. Alternative B addresses both concerns by retaining the emphasis on carefully monitoring inflation developments while also conveying that, although the labor market may strengthen somewhat

> further in the near term, the Committee doesn't see a need to actively pursue an even tighter labor market. Alternative C sends a message of greater urgency to contain further labor market tightening by stressing the need for growth in output and employment to slow to sustainable rates. Alternative A, by contrast, expresses sufficient concern about the risk that recent low inflation readings might continue that it is implicitly willing to tolerate a larger undershoot of the unemployment rate below its longer-run level so as to forestall a decline in inflation expectations.
>
> Thank you, Madam Chair. That concludes my prepared remarks. The November statement and the draft alternatives are shown on pages 2 to 13 of the handout. I will be happy to take questions.

CHAIR YELLEN. President Williams.

MR. WILLIAMS. Thank you, Madam Chair. I have a question. I thought Thomas's analysis was very interesting about the change in the term premium and how to interpret these slope-of-the-yield-curve models. But I guess what worries me—I'm picking up on Governor Brainard's remarks yesterday—is these comments by market participants in which they actually attribute the fact that we have a flat yield curve to a very low long-run funds rate, or *r**, and low global yields. Of course, those are two reasons why we have to be more worried, I think, about our ability to manage recessions or the possibility that a shock would actually put us into recession. So when I read the reasons for this, it actually makes me a little bit more worried about how to read a flat yield curve.

I guess my "takeaway" from this is that I agree that the fact that the term premium has shifted, partly because of quantitative easing in the United States and abroad, tells us that maybe these standard historical relationships have shifted. I'm not as, maybe, encouraged by this 2 percent number with the adjusted spread, because the reason for this flattening of the yield curve is probably actually, in part, a negative thing, in terms of the increased possibility of a future recession. So that was my reaction. I don't know if there was a question there, but— [laughter].

MR. LAUBACH. No, that's fine. I agree that a low longer-run federal funds rate is not necessarily a reassuring piece. On the low global yields, I would point out that there are, of

course, a number of major central banks that are still engaged in asset purchases. And Steve Kamin, in the past, presented results regarding potential spillovers of that to U.S. yields, which look pretty sizable. So the "low global yields" point may not be just a "low global long-run r^*" point, but also, in part, still spillovers of policy accommodation that we anticipate will, at some point, go away. So that would be a factor that, over time, would be expected to lift long-term rates.

MR. WILLIAMS. Thank you.

CHAIR YELLEN. President Evans.

MR. EVANS. Thank you, Madam Chair. A quick follow up: I thought that Governor Quarles's comment yesterday was really interesting when you were talking about how various business models might be affected by the flatness of the yield curve—banks' in particular, but other firms' as well. And that got me thinking—I came in with that question, too.

One issue would be, I guess, as we continue to increase the funds rate—and I know Vice Chairman Dudley has mentioned this before, quite some time ago—if the yield curve doesn't increase enough, then maybe we have to raise the funds rate more quickly, expecting that would work its way into the pricing of the 10-year rate, and that could steepen it. So short-run monetary policy is one avenue. President George mentioned yesterday, I believe, additional SOMA sales could also push up the 10-year rate.

At the Conference of Chairs meeting, I thought there was a very interesting presentation by the IF group that talked about, as the ECB begins to exit from their asset purchases, I thought the effect on the U.S. 10-year rate was on the order of 75 basis points, so it was really quite large. I had not been anticipating or paying attention to that. But that would be another factor that would lead to a steepening yield curve.

So I guess my question is, of all of these factors and others that I haven't mentioned—short-term policy, foreign asset purchases—which of these factors is most likely to help us benignly exit this flat yield curve without a recession, if that's possible?

MR. KAMIN. I could make one response apropos of the international influence. I think 75 basis points is in the neighborhood of what we would regard as the "all-in" effect of QE abroad on our term premium.

Now, in the period ahead, we're expecting that the upward pressure on the term premium as foreign central banks exit to be much slower than the effect as they entered QE. In our projections, we don't have the ECB and the Bank of England actually starting to run down their balance sheet until, like, 2021 or 2022, and then only slowly. And we actually don't have a year specified for when the Bank of Japan starts to run down, or even stops adding to, its balance sheet. So we think, in the long run, foreign central banks will exit from QE, and that will create some upward pressure, but we don't expect that to happen soon or quickly.

MR. LAUBACH. For what it's worth, in the case of your portfolio runoff, we currently think that it's adding about 12 basis points to the term premium per year, roughly. And another potential factor that came out of the conversations with market participants points to low inflation risk premiums. Arguably, if inflation became more anchored symmetrically around 2 percent, I could see that there'd be a slight reversal of those very compressed inflation risk premiums, because risk will be a little less skewed to the downside.

MR. EVANS. Thank you.

CHAIR YELLEN. Questions? President Kaplan.

MR. KAPLAN. I'd just make one other comment. If you gave me, without knowing all of the facts, a hypothetical that the shape of expected real GDP growth was 2½ or maybe

something close to 2½, trailing off down to trend growth of 1.8—some would think even lower—I would have said to you that, as a market participant, I would expect shorter rates to be a little higher, and longer rates to be lower because they're priced off that longer-run growth. And while liquidity has some effect on this, the overall shape, if you said I got a short-term bump, but in the medium term and longer term, it's going to be trailing down, I would expect that would flatten the yield curve or create a different yield curve shape. And that kind of is the fact pattern we have, and we're telling the public that that's the fact pattern. And I think market participants kind of agree with that analysis. So it strikes me as rational, you know—what we're seeing, a little bit.

MR. LAUBACH. I agree. Unfortunately, we don't have really much historical precedent to point to that, right? Logically, you would think, in a time when the term premium is pretty compressed, close to zero, and as you move to neutral, the yield curve should go flat. But, again—as also pointed to in the historical data, of course—there is this unpleasant correlation between a flat yield curve and the onset of recessions.

MR. POTTER. None of that implies the 10-year rate should stay at 2.4 percent. The 10-year rate needs to move up.

MR. KAPLAN. Right. I agree with that. I'm just talking about the shape of the curve—

MR. POTTER. The shape's too flat.

MR. KAPLAN. —at whatever level you would think that kind of fact pattern would suggest. And I agree with you. We were talking about, what will market participants do? If you have a flat curve—the reason we haven't, historically, at least in the United States, had extended inversions is, market participants said, "I'd rather buy at the short end of the curve than the long end of the curve. If you want me to buy at the long end, you've got to pay me. And if you want

me to buy private corporate debt, you'd better really pay me a good spread, because I can earn more short." And, as a businessperson, I don't want to keep paying that, unless I'm very pessimistic about the future. So we'll have that discussion as we go, I'm sure, this next year.

MR. WILCOX. Could I muddy the waters just a little bit? [Laughter]

CHAIR YELLEN. Sure.

MR. WILCOX. A couple of considerations. If all elements of long-term rates were created equal, then, for a given funds rate, a steeper yield curve is kind of a two-edged sword for what one would expect for the pace of real activity. On the one hand, it could be a positive, as Governor Quarles pointed out, if a steeper yield curve is a plus for bank profitability and increases their willingness or wherewithal to extend credit to nonfinancial actors. On the other hand, I started by positing, for a given funds rate, a steeper yield curve. Well, that means higher long-term interest rates, and we think that, in many respects, it's longer-term interest rates that are important for spending through things like mortgage rates or bond rates for investment—that sort of thing. So that's one consideration. There are elements that could go either direction there.

The other consideration I would mention is that it could be that not all elements of long-term rates are created equal in terms of their influence on spending. And—I think Michael Kiley is here. He had some research earlier, a few years ago, suggesting that the term-premium piece may have less influence on aggregate demand than the expectations-component piece of it.

So these issues that you're raising have a variety of complex crosscurrents involved in them.

CHAIR YELLEN. Further questions? [No response] Okay. Seeing none, let's begin the round with President Williams.

MR. WILLIAMS. Thank you, Madam Chair. I'll try not to muddy the waters. [Laughter] I support alternative B.

I stated at the previous meeting that I would need to see a sizable downside surprise in the data to change my mind about the need for a rate increase today. In fact, the data have come in even stronger than I expected overall. The economy has been growing well above the potential rate, despite being buffeted by various natural disasters. We're already well past our full employment goal, and the tax package being finalized in the Congress will likely modestly boost growth over the next few years. Overall inflation was held down earlier this year by transitory developments affecting a few categories of goods and services. And, as these developments loosen their hold, I expect the continued tightness in the labor market will push inflation back toward, and in fact a little beyond, our target in the coming years.

In adjusting the stance of policy, we've agreed to take a balanced approach to dealing with misses to our dual-mandate goals. In this regard, it's important to note that inflation is currently undershooting our longer-run goal by as much as unemployment has fallen below its natural rate.

In my forecast, as well as in the Tealbook's and in the SEP medians, these misses become increasingly imbalanced as the unemployment rate drops below 4 percent and inflation moves closer to target. This growing imbalance calls for a gradual increase in interest rates over the next two years. A rate hike at this time is an important step toward normalizing policy under these circumstances. It also leaves us well positioned to respond to new developments. Against this backdrop, a continued gradual pace of rate increases, with contingent adjustments if either side of the risks materializes, is consistent with a commitment to a balanced approach toward our dual mandate.

If the economy evolves as expected, I envision three rate increases in the coming year and an additional three in 2019, with the funds rate eventually reaching 3 percent in 2020. I should note that since I still view 2½ percent as the neutral federal funds rate, my projection does include some overshooting of *r** to slow an economy that will have far exceeded potential and, in fact, a modest overshoot of our 2 percent inflation target in 2020. Thank you.

CHAIR YELLEN. Thank you. President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. I support alternative B. With inflation firming and the unemployment rate likely to fall well below what is sustainable, removal of accommodation at this meeting is appropriate.

If, as the Tealbook assumes, the unemployment rate falls well below 4 percent and total and core inflation move toward 2 percent, I believe we will need to recalibrate the market's assumptions regarding further tightening. Currently, the CME implied probability of tightening is less than I am assuming. I hope the statement and the SEP will start the process of moving the market to a higher likelihood of more significant tightening this coming year. At this point, with already strong growth and further fiscal stimulus on the way, I would be concerned if the market does not begin to place a higher probability on a March increase, with several more increases to follow. Further delays in the gradual process of removing accommodation would make it quite likely that we will need to move more rapidly as inflation converges to our target but we move further below a sustainable unemployment rate.

It is notable that in the optimal control exercise with balanced weights, the interest rate path is dramatically higher than the assumptions in the staff forecast. While I am not advocating the path provided in the optimal control exercise with balanced weights, it does highlight the

potential risks to achieving both elements of our dual mandate if we do not pick up the pace of the removal of accommodation somewhat.

Finally, the difficulty we have experienced in achieving our dual mandate when we have little room to lower the funds rate highlights the possibility that our current policy framework may not provide sufficient insulation from negative shocks in the low-inflation environment, especially when equilibrium rates are also low. While there probably is not sufficient time to develop a full discussion of the framework and our current inflation target for the January meeting, I would welcome such a discussion at a future date. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Bostic.

MR. BOSTIC. Thank you, Madam Chair. I support the policy action in alternative B. However, I continue to worry that my forecast of inflation is overly optimistic. And that implies a cautious, data-dependent approach to any further policy tightening next year.

I found it interesting that a number of participants thought the suggested reordering of the inflation language in paragraph 4 was unhelpful. I actually like the proposed change, because I think that it is important for the Committee to make as clear as possible that it really does view its inflation objective symmetrically. I thought that the change in order, even with no change in words, would attract attention and lead to a commentary at the press conference, which would be quite helpful in making the point.

As you all know, despite the Committee's policy efforts, inflation has averaged well below 2 percent for a protracted period. Our forecasts, too, tend to have inflation returning to our target from below, with relatively little overshoot. Consequently, and as emphasized by several participants at the previous meeting and at this meeting, it is possible that the public's expectations are starting to settle on the 2 percent objective being a ceiling rather than a

midpoint. That, I think, is not the Committee's intention, and it's my view that we should take as many opportunities as possible to make that point.

As I mentioned at the previous meeting, I think it would be useful, at some point soon, to revisit how we formulate and communicate our inflation objective. January is when we look again at our Statement on Longer-Run Goals and Monetary Policy Strategy. That might be an appropriate time to consider changes to reinforce our commitment to a symmetric 2 percent objective for inflation over the longer term. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Bullard.

MR. BULLARD. Thank you, Madam Chair. The Committee is poised to raise the policy rate today despite having made essentially no progress toward our 2 percent inflation goal over the past two years. Two years ago, our inflation narrative was essentially the same as it is today. The economy is heating up. Inflation will slowly return to target because of Phillips-curve effects, despite our estimates of those Phillips-curve effects as being very minor.

Today we are threatening to raise rates faster in 2018, doubling down on a theory that hasn't worked over the past two years. Observers might be forgiven if they think we're not that serious about achieving the inflation goal.

We can also view the current situation in terms of price-level targeting. Results in the research literature suggest that price-level targeting or, alternatively, its close cousin, nominal GDP targeting, is optimal monetary policy.

Deciding on a price-level path is sensitive to the starting point, but let's start at 1995, when the Committee can be interpreted as implicitly adopting and achieving a 2 percent inflation target. From 1995 to 2012—a period of 17 years that included two recessions—the Committee kept the United States on a 2 percent price-level path, implicitly following the price-level

targeting policy. Since 2012, however, we have fallen off this path, arguably following suboptimal policy, so that we are now about 4½ percent or so below the price-level path. Inflation would have to run above 2 percent for several years to return us to the price-level target.

Again, staying on the price-level path is arguably optimal monetary policy, according to research with some standard models. This has given me some pause about our current policy. We have missed the inflation target to the low side for six years in a row. We should be hitting it, on average, over that long a period.

Let me turn now to the neutral level of the policy rate. I think we're at the neutral level today. The key consideration here is the short-term real rate of interest, *r**—or what I've called *r*† in order not to pollute the excellent work of Laubach and Williams on this topic. The one-year ex post real yield declined on trend by about 700 basis points from the mid-1980s until today. In the short run, we can influence this real rate with our policy. But its longer-run trend is driven by fundamental factors that are out of our control.

In calculations we've done at the St. Louis Fed, we divided these fundamental factors driving the longer-run trend into three components: labor productivity growth, labor force growth, and a global demand for safe assets. Each of these factors could be viewed as being in either of two states: a high state or a low state. Let's examine all three.

Productivity growth looks like it remains in the low state. You can look at the Kahn and Rich productivity growth model on the Federal Reserve Bank of New York website. There have been improvements recently in labor productivity growth. But that's only from very low levels, so it still looks like productivity growth is in the low state. According to the model, the probability is still in the 90 to 95 percent range that we're in the low productivity growth state.

For labor force growth, is it in the high state or the low state? A look at the data suggests you can make a case that labor force growth has been picking up, perhaps because of very strong labor markets in the United States that are bringing marginally attached workers back into the labor force. So I'm a little more agnostic on that dimension, about whether we're in the low state or the high state for that fundamental factor.

As for global demand for safe assets, that demand seems to remain extremely high. That drives yields lower, and I see no prospect for exit over the forecast horizon on that dimension.

Altogether, with productivity growth low, labor force growth ambiguous, and global demand for safe assets very high, that suggests that *r*† remains in negative territory. If we then adjust for output inflation gaps, the current policy rate is within the recommended range, but we are getting to the upper limits of the range that's recommended by this model. The upper limit would be 150 basis points if labor force growth remains in its low state, and 200 basis points if the labor force growth is high.

So we're okay for today as far as a neutral policy rate is concerned. I'm not sure we want to be at the neutral policy rate, because inflation is below target. That suggests we're not putting the upward pressure on inflation that we think. And in 2018, if we go higher, we're going to blow through these upper bounds, and we're going to be putting arguably downward pressure on inflation at a point at which inflation hasn't yet got back to target. So I think we're too "hawkish" for 2018. The bottom line is, we're in a low-real-rate world that we're, I think, still adjusting to as a Committee, and we're likely to remain in that world.

This way of thinking about the neutral policy rate means there's less emphasis on mean reversion than is typically the case around the table here. A mean-reversion model says that there's only one long-run outcome and you must be trending back to that outcome, however

slowly, and therefore rates have to rise. But in the model I described, the fundamentals have to switch to their high states in order to get movements on the real rate, and, to the extent that we don't think they're going to switch over the forecast horizon, there'd be no reason to move. So how you want to interpret the real rate really amounts to the question of how you want to view the mean-reversion issue.

This is also why I think the yield curve may be an issue in 2018. We think as a Committee that real rates will rise and the policy rates will rise with those real rates as the economy continues to improve, but the market thinks otherwise at the long end, and that's creating a conflict in the yield curve.

For today's policy, we have alternative B on the table. I have several elements of this that I'd like us to think about. I take it as given that we're going to go with alternative B today, but I do think we need to think about paragraph 4. I prefer the paragraph 4 from alternative A, which crosses out some of the language about the need to remain accommodative and to continue raising the policy rate. If we don't do something about this as we get closer and closer to the neutral rate—or I think we're at the neutral rate today—then I think we're going to go too high on the funds rate and sending too "hawkish" a signal to markets.

I have a traditional central banker side to me: I have been in this business for 25 years. I appreciate that the market is letting us move at this meeting. It's already been priced into markets. So, in that sense, I do think that we should go ahead with our intended move today. So most of what I'm talking about is the outlook for 2018. I also appreciate we have a transition going on for the chairmanship. This is not a good time to try to surprise markets with a surprise move here at the table.

I also think that, in 2018, we need to fix the SEP because of the September signaling problem. When you get to the September part of the SEP, you're basically saying whether you're going to raise the rates in December, because there's essentially only one meeting left. This is the third occasion in a row when we basically signaled in September that we were going to raise the rate in December. The data have gone with us on all three occasions, and that's worked out fine. But I think, one of these years, it's not going to work out so well for the Committee, and it's unnecessary. What you should really be doing in every SEP, as other central banks do, is give a 4-quarter and 8-quarter and 12-quarter projection from now on, and it shouldn't be tied to the calendar year. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Brainard.

MS. BRAINARD. Thank you, Madam Chair. The disconnect in the signals we've received over the past few quarters—between continued strengthening in the labor market and the step-down in inflation after many years of below-target performance—has posed a conundrum for monetary policy. But the high likelihood of sizable and relatively front-loaded fiscal stimulus while the economy is at full employment tips the balance of considerations, in my view, and gives me greater confidence that the signals may move in consistent directions again next year.

If we see a resolution of this tension next year, as I hope, this will make navigating the path ahead somewhat more straightforward, although likely not easy. Our coming decisions will need to balance, on the one hand, the ongoing expansion in the real economy to levels beyond common estimates of full employment with, on the other, inflation that may well continue to run below our longer-run objective over the next couple of years.

In my SEP submission, I've threaded this needle by including gradual increases in the federal funds rate over the next several years. My hope is that the path will effectively achieve two objectives: convincing the public that we are committed to achieving inflation of 2 percent, on average, over time while, at the same time, avoiding excessive overshooting and possible financial imbalances. I should note that my projected path slightly overshoots my projected long-run federal funds rate. This appears to be the case for many others' paths as well.

Like President Bullard, I believe the "sell-by date" of the forward guidance in paragraph 4 has long since expired. I would favor removing, in particular, the reference to the federal funds rate being "likely to remain, for some time, below levels that are expected to prevail in the longer run." I would favor removing that now or in the near future.

As the Chair noted yesterday, with today's increase, we may indeed be within striking distance of neutral, especially as inflation is 50 basis points below that long-run nominal level on which the long-run neutral rate is premised. Of course, while my central view is that modest further increases in the funds rate will be appropriate, we should be attuned to the possibility of proceeding differently in either direction. The appropriate path will be informed by risk-management considerations on both sides as well as by incoming data.

If, for example, labor market tightening was to continue at an accelerated pace and asset prices were to move up sharply further, boosting demand even more, we may want to consider a steeper trajectory. On the other hand, if the anticipated pickup in both actual and underlying inflation fails to materialize over the course of next year, we may need to signal a more gradual approach. There is historical evidence that policymakers have found it difficult to guide unemployment gently higher when the labor market tightens to unsustainable levels, and there is also evidence from other jurisdictions about the perils central bankers face when they allow the

public's persistent experience of under-target inflation to become embedded in lower levels of longer-run inflation expectations.

While the shortfall in actual and trend inflation in the United States may be modest today, we should keep in mind the examples of Japan and now the euro area, where it appears that longer-run inflation expectations are lower than they are here. We should move to bolster longer-run expectations while we have the opportunity—that is, when the economy is doing well—to avoid the risk of a further step-down in expectations during the next cycle, when we will likely once again be pinned at the effective lower bound on short-term interest rates. This is an approach that may be described, perhaps, as opportunistic reflation. But that's a theme that we will return to potentially in the future. For now, I support alternative B. Thank you.

CHAIR YELLEN. Thank you. President Harker.

MR. HARKER. Thank you, Madam Chair. I support alternative B at this meeting, but I'm somewhat disappointed with the removal of the paragraph 4 language that placed additional emphasis on actual inflation behavior. We have been consistently wrong about inflation returning gradually to target, and I think additional emphasis on inflation's actual behavior is warranted. I would suggest adding language into future statements if inflation continues to disappoint.

With a December increase in the funds rate, I am inclined to be rather patient regarding future policy moves, and I have reduced my view of appropriate policy to two rate hikes in 2018. I have become increasingly concerned about inflation remaining persistently below our 2 percent target. Even if patience implies that inflation will eventually exceed the target, that may not be a bad outcome. It will reinforce the message that 2 percent is a point target and not a ceiling.

Additionally, overshooting the target would give us the operational flexibility to change our approach to conducting monetary policy in a low-*r** environment.

I've emphasized in previous statements that, in a low-*r** environment with a symmetric loss function, there exists the potential problem that average inflation will be less than the 2 percent target. Hence, inflation expectations could be less than 2 percent, making it more difficult to reach 2 percent inflation on average. One possible change that could ameliorate the problem is adopting an asymmetric loss function, as suggested in a recent paper by Gust, López-Salido, and Meyer. Another would be to raise the inflation target and perhaps revisit the target every five years, as the Bank of Canada does. That would give us the flexibility to adjust the target in light of new information on the evolution of medium- and longer-run economic fundamentals. A third possibility might be the adoption of price-level targeting, as suggested by others and as suggested recently by Presidents Evans and Williams.

Those are just a few options, and at this point, I'm not saying which option I prefer. But I would urge us to start a serious discussion concerning the pros and cons of our current framework as well as the various alternatives to it. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Evans.

MR. EVANS. Thank you, Madam Chair. I do not support raising the federal funds rate today. I think our decision today is a close one and a judgment call, but I don't think achievement of our symmetric 2 percent inflation target will be well served by once again raising the funds rate while inflation substantially underruns 2 percent and inflation expectations are too low to be consistent with our symmetric objective.

Since October 2014, our FOMC statements have repeatedly mentioned that inflation expectations have moved down, and I see little or no evidence of their recovery. I think the

100 basis point tightening we've made to date has been gradual enough to accommodate continued inflation improvements, but I worry that additional moves at this point in the inflation cycle may not leave enough accommodation in place for us to be confident of lifting inflation to 2 percent. Leaving our target at 1 to 1¼ percent today would better support a general increase in inflation expectations. This would increase the likelihood that inflation will rise to 2 percent, and perhaps beyond, and thus provide more support for the principle that our inflation objective is indeed symmetric.

As I've argued often in recent months, I think our crucial longer-run strategic focus should be to reinforce the public's faith that our inflation objective is symmetric. This would be an excellent time to incorporate such emphasis into our actual policy decision.

Combined with an expected increase in aggregate demand due to fiscal stimulus, a funds rate pause until mid-2018 would likely improve inflation expectations notably. Such a pause also would better allow the Committee time to assess the progress of incoming inflation data.

The Tealbook and many around this table argue that the drop in core inflation this past spring was probably transitory. Waiting until at least the middle of next year would give us the chance of seeing whether this is true. I hope it will be the case, and a gradual pace of rate increases could resume in either June or September with a more confident belief that inflation would reach 2 percent over the medium term.

I've described my views of the risks associated with the evolution of inflation and inflation expectations at a number of meetings, so I won't repeat those arguments now. But, in light of the strong consensus supporting continued rate hikes while core inflation underruns our 2 percent objective, I recognize that other participants are weighing the costs and benefits

differently. Of course, I've also given much thought to the other risk-management aspects of my policy recommendation, and I want to state my views on these very explicitly now.

So, what if Evans is seriously wrong? What if inflation takes off to 2½ percent, appears on its way to 3 percent, and long-term inflation expectations also rise noticeably? An easy answer would be for me to say we can simply raise rates, keep raising rates, and make sure that we raise them enough so that inflation stays within an acceptable range. But I also know that many who argue for raising rates now also have a risk-management perspective. Many argue that there would be great value in ensuring that the unemployment rate does not undershoot the natural rate by so much that policy eventually would have to generate large increases in unemployment, large enough to seriously threaten continued economic expansion. According to this perspective, maybe the better policy would aim to avoid triggering a recession in the future by continuing our gradual policy tightening today. And that view has been expressed already this morning.

This is a serious argument, which I wouldn't presume to dismiss. But I think these fears are stoked by our historical experience in the 1970s and early 1980s. And I believe that these episodes are less relevant today than our conservative, inflation-fighting memory leads us to think. Those periods when the FOMC kept raising interest rates to get inflation under control had two key characteristics. Cyclical inflation was rising when economic resources were under great pressure, and inflation already was much too high and had been for some time. That is, those past Committees were fighting both cyclically rising inflation and an unacceptably high longer-run inflation trend.

Today our problem is different. We face low inflation and low inflation expectations. Some cyclical upturn in inflation would actually be welcome, at least for another 50 to 100 basis

points. After all, a welcome increase to 2 percent or a bit beyond is what a symmetric 2 percent objective should mean after almost eight years of undershooting. And even if core inflation went to 2½ percent by 2020, which I view as unlikely, we shouldn't be so troubled. It wouldn't be a large overshoot, and it would helpfully reinforce our symmetry principle.

Now, hypothetically speaking, what if we follow my prescription and keep the target range at 1 to 1¼ percent today and then, in six months' time, find that inflation and unemployment have moved a lot and additional policy tightening is needed beyond my expectations? In that case, I believe it would be sufficient that we gradually increase the funds rate modestly above the neutral rate—say, 50 basis points—and then wait it out. In this scenario, we wouldn't have to do the radical tightening done in the past. We would have to fight only half of our historical inflation battle. We do not need the extra restraint to bring down trend inflation. And such a modestly restrictive policy setting is unlikely to jeopardize continued economic expansion or the desired upward adjustment in trend inflation unless there's more fragility than we expect.

I would publicly communicate this policy of setting the funds rate at the long rate plus 50 basis points in the following way: "Our currently restrictive setting should be adequate to reduce inflationary pressures gradually and return inflation to target over the medium term. The Committee would carefully monitor actual and expected inflation developments relative to its symmetric 2 percent inflation goal to assess if further action is warranted in either direction."

At this point in my argument, some around the table might say, "We've never conducted monetary policy this way." That might be right. But that's because, in most previous episodes, inflation was very much above our objective of a low and stable rate. That's simply not the case now. Today the low starting point for underlying inflation and inflation expectations means that

we would need to provide only modest restrictiveness to fight a cyclical upturn of inflation in the 2½ to 3 percent range, if that's the situation we're facing.

To sum up, I think there are important risks to consider on both sides of the ledger. But after weighing all of the risks, I still come down thinking that we are best served by putting policy on hold for a few more months in order to gain a better assessment of the inflationary environment. I do not support a rate hike today. I prefer more accommodation that would provide better support for the achievement of our symmetric inflation objective. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Mester.

MS. MESTER. Thank you, Madam Chair. I support alternative B and the statement as written.

The economy is ending 2017 with some momentum. Growth is expected to remain above trend. Labor market conditions are strong and are expected to continue tightening, with the unemployment rate falling further below most estimates of its longer-run rate. Inflation remains below our 2 percent goal, but it has stabilized in recent months, and I project it to rise back to 2 percent over the next couple of years, albeit gradually. Taking into account current economic and financial conditions, the medium-run outlook, and the risks associated with the outlook, I view a 25 basis point increase in the funds rate today as an appropriate step in fostering our dual-mandate goals of maximum employment and price stability.

I continue to view the gradual removal of accommodation as being the best strategy for sustaining the expansion and balancing the risks to our dual-mandate goals, with the actual path of the funds rate dependent on how the economy evolves. The statement language in alternative B gives this message, and I think it's appropriate.

For the first time in several years, there are some salient upside risks to the forecast. The tax cuts have the potential to increase growth more than projected, and labor market conditions could tighten even more than anticipated, putting upward pressure on inflation. On the other hand, it's difficult to project inflation, and the fact that it's run below target for some time, even in the face of a tight labor market suggests it could remain low. There are now also some nascent signs of building financial stability risks, including "lofty" commercial real estate prices and high stock market valuations.

The possible alternative paths that the economy could take mean we'll have to be nimble in making our policy decisions. It would be risky for us to focus only on the undershoot of inflation and ignore the projected undershoot by the unemployment rate of estimates of its natural rate, even though those estimates are imprecise.

Similarly, we need to recognize the limitations in our ability to forecast inflation and the possibility it could remain below our goal for longer than we expect. And we'll also need to monitor our normalization of our balance sheet and how it's affecting the economy.

But despite the uncertainty about how the economy will evolve, I think it's important to be transparent with the public. We need to give them our best sense of the economic outlook, the risks, and what we think appropriate policy will be in response to the outlook and risks. And we need to do this even though there's uncertainty about the policy rate path and the path can be expected to evolve depending on the economy. I think that we're up to the challenge and that we'll have plenty of opportunities to hone our craft in the coming year, albeit without someone who's been one of our master craftspersons. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Quarles.

MR. QUARLES. Thank you, Madam Chair. I support alternative B as written. I expect a continued gradual path of increases in the federal funds rate, as inflation moves past the transitory factors that have been holding it back and as the labor market remains relatively tight.

The prospect of tax cuts hasn't materially affected my outlook for the path of policy rates over the next few years. I'm not expecting much additional inflationary impetus that might call for a steeper rate path, as increases in potential output and in labor force participation should work to keep price pressures in check.

In the longer term, higher potential growth is likely to push up the natural rate of interest, and this should relieve some of the pressure of operating monetary policy so close to the interest rate's lower bound. In that regard, I would direct everyone to look again at the speech that former Governor Fischer gave in October of last year, in which he traced out the implications for *r** of various economic shocks and, using the staff's FRB/US model, he showed that a persistent cut of 1 percent of GDP in taxes should boost *r** by about 40 basis points.

A bit on inflation and price stability. Reiterating what I said at the previous meeting, I think we have to be careful about just how hard we want to push to inch inflation up a few tenths of 1 percent. I fully recognize the importance of maintaining well-anchored inflation expectations and the need for symmetry around our target. But, in thinking about symmetry about how we approach our target, I try to imagine how we would react in a world in which inflation was hovering with no obvious momentum at 2½ percent, a little above our target, while unemployment was above our estimate of the natural rate—say, at 5.1 percent—with clear upward momentum. I think it's fairly obvious that we would, in a symmetrical approach, react in the opposite direction to the way we're reacting now, gradually and appropriately, and that if

we think about symmetry with regard to the whole situation, as opposed to simply one element of the situation, we would think differently about whether we are behaving symmetrically now.

Two minor points—maybe not so minor. With regard to the September SEP, I want to agree with President Bullard on the signaling issue. I have little experience with it, so take that for what it's worth. But it does make logical sense to me that we should be changing the time frame over which we're projecting in September. But while wanting to maintain a symmetrical approach to my support for President Bullard's comments, I also would like to say that, without wanting to attach magical properties to any particular talisman, I do find the inclusion of the Taylor (1999) rule diamonds in exhibit 3 of yesterday's presentation of the Summary of Economic Projections to be helpful. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Madam Chair. I support alternative B as written. With the unemployment rate at 4.1 percent and with expectations of solid near-term real GDP growth, I think we're on a course that will take us well past full employment over the next year and in the medium term.

Cyclical forces and inflationary forces are building, I believe. I do think that these forces will help offset at least some of the structural headwinds that I've talked a lot about—technology-enabled disruption and, to a lesser extent, globalization—but we'll have to see how that unfolds.

I believe that, at this moment, excesses and imbalances in the economy are likely manageable. But I also believe that excesses and imbalances are likely to build over the next year. Excessive commitments by firms and households have the potential to produce outsize responses when growth moderates, as we expect in the out-years, and these commitments will

need to be unwound in the future. And I think the tax plan will exacerbate these factors, potentially.

I've also spoken about elevated levels of today's real asset and financial markets versus historical measures. That does not mean the valuations can't get fuller—I would guess they can, and they well might—but it does suggest the need for heightened vigilance, so that we monitor buildup of leverage and/or other imbalances associated with historically high levels of valuation.

So, as I take all of that into account—and consistent with our Statement on Longer-Run Goals and Monetary Policy Strategy, which we reaffirm every year and we did earlier this year—I'm looking at the size of the current and potential full-employment overshoot and balancing that against the size, timing, and trend of the likely inflation undershoot. And when I balance both of those, I'm convinced that taking a step today and removing accommodation gives the FOMC the best opportunity to stay with a strategy of removing accommodation in a modest, gradual, and patient manner. From a risk-management point of view, I think this gradual and patient approach—if we can avoid getting "behind the curve" and having to play catch-up—gives us the best opportunity to extend the recovery and the expansion of the U.S. economy, which in turn will also likely give us the best chance to achieve price stability on a sustained basis. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President George.

MS. GEORGE. Thank you, Madam Chair. I support an increase in the target range for the funds rate at this meeting. This action would represent a continuation of gradual policy adjustments promoting our objective for long-run sustained growth.

The proposed language in alternative B, I think, appropriately justifies today's policy action based on economic conditions, but it stops short of describing the medium-term outlook

for employment and inflation. While inflation is expected to move gradually toward the Committee's target, the outlook also anticipates that labor market conditions will deviate further from their long-run sustainable levels. As we move into 2018, it would be appropriate, in my view, to revisit the language that describes that outlook at one of our future meetings, perhaps along the lines of paragraph 2 in alternative C, which more effectively ties the policy action to the medium-term outlook.

With the growing deviation in the unemployment rate over the forecast horizon from its longer-run level, our projections point to a slowing of economic growth below trend, with unemployment eventually rising to its longer-run level. This has been a challenging needle for policymakers to thread in the past. It certainly may be the case that this time will be different. But, with the funds rate remaining below levels that are expected to prevail in the longer run, combined with a very large balance sheet only gradually shrinking, we will likely need to wrestle with this communications challenge over the next few years and explain future policy actions in light of such forecasts. Thank you.

CHAIR YELLEN. Thank you. Acting President Mullinix.

MR. MULLINIX. Thank you, Madam Chair. I support alternative B and a rate increase today, and, as in my September submission, my SEP has four funds rate increases in 2018, similar to the Tealbook baseline. I also project unemployment to decline below 4 percent in the next three years. With the further tightening in labor markets, the low level of the real funds rate, and the improved core PCE numbers for the past two months, it is difficult to see a downside to this policy rate path, assuming, of course, the data come in as projected over the forecast horizon.

I will briefly mention one concern, in connection with the gradual increase in rates, that has received some attention—the behavior of the yield curve. I am sympathetic to the argument found in the analysis on pages 8 and 9 of Tealbook A. While there is a historical relationship between yield-curve inversions and recessions, that correlation is driven in large part by episodes in which the FOMC either fell "behind the curve" or was in danger of falling "behind the curve" and felt that it had to push up rates aggressively in the face of rising inflation. In contrast, in the baseline forecast, we seek to remove accommodation gradually, while keeping inflation expectations stable in the context of a persistently low term premium.

Of course, there's always a possibility that we will fall "behind the curve" and need to push up rates rapidly, tipping the economy into a recession and generating another episode in the inverted-yield-curve–recession relationship. I expect that the gradual increase embedded in the Tealbook baseline and my SEP submission manages the risk of falling behind and will help avoid that outcome.

In closing, professionally and personally, it's been a high honor to serve the Fifth District as interim president and as a member of this Committee. And thank you, Madam Chair, for your leadership over these recent years.

CHAIR YELLEN. Thanks so much, Mark. President Kashkari.

MR. KASHKARI. Thank you, Madam Chair. I support alternative A. I have not supported rate increases this year because I've not seen much evidence that inflation is actually climbing toward our 2 percent target.

Since my first dissent in March, there have been strong employment gains that have continued, but there's been little evidence that these job gains are translating into either nominal wage growth or inflation. This makes me think that we are still likely below our maximum-

employment objective, and that inflation expectations are likely significantly below our target. I, therefore, continue to believe that we should not raise rates further absent evidence of a sustained increase in inflation toward our 2 percent target or a move up in inflation expectations. Raising rates will only slow job growth, imposing real cost to the U.S. economy. It'll also damp nominal wage growth and inflation and increase the risk of inflation expectations slipping further.

These are arguments you've heard me make before. The one new argument, which got a lot of attention at this meeting, is the flattening of the yield curve. I share my colleagues' concerns about that. First of all, I agree with the comments that President Williams made this morning about market participants' views. I didn't find them very satisfying, saying "Oh, we're not worrying about the flattening. It just means there's a low longer-term *r** or low inflation risk premium." I'm concerned about both of those things, and I think we all should be, too.

Second, I found the discussion this morning somewhat confusing to me about what's happening with the yield curve. I know we're going to talk about it more next year. I don't think it's that complicated. I think we are raising interest rates in the absence of inflation. So we're pushing up the front end, and we're putting a lid on inflation expectations on the back end, and we're causing the flattening of the yield curve. That's how I interpret it. It seems like it's pretty straightforward, but I'm open to learning more, and it's something I'm going to be very focused on next year. Thank you.

CHAIR YELLEN. Thank you. Governor Powell.

MR. POWELL. Thank you, Madam Chair. I will support alternative B as written.

Incoming data indicate that the labor market continues to tighten and that inflation appears to be bottoming out. With solid real GDP growth here and abroad and fiscal stimulus arriving, we seem to be on track for at least a couple of more years of above-trend growth, and

on that path, the unemployment rate is likely to continue to fall. With further declines in the unemployment rate, I see it as likely that inflation will stabilize around the 2 percent objective over the next couple of years. And I also see these conditions as supporting a rate increase today.

As I mentioned yesterday, I see a risk that, conditional on growth being about as set forth in the median SEP path, unemployment may move significantly lower rather than flatten out as reflected in the median SEP unemployment rate path. Such a decline could be accompanied by excessive inflation pressures, which could require us to tighten policy more aggressively, potentially threatening the longevity of the expansion. I hasten to add that I currently see no signs of labor market overheating or of building inflation pressures. To the contrary, the other main risk I see to the outlook is that inflation will remain below target longer than we anticipate.

In practical terms, I see a need to balance the risk of an overheating economy against that of stubbornly too-low inflation, and I continue to view a gradual approach to removing accommodation as appropriately balancing these two risks. A gradual pace of interest rate increases will allow us to make a better assessment of the degree of labor market tightness as well as the underlying trend of inflation.

I want to conclude by returning to the question that President Bullard posed yesterday regarding the utility of including the Taylor (1999) rule as part of the dot plot in Bob Tetlow's presentation yesterday, and I have a couple of things to say. First, we often say that simple policy rules can provide a useful benchmark for assessing the appropriate stance of policy, and, to me, the application of the Taylor (1999) rule in Bob Tetlow's briefing was a nice example of that. Of course, we wouldn't want to chain our policy to a rule, but rules like Taylor (1999) do

embody principles of good monetary policy. As a result, I do find it useful to see how our SEP policy rate paths compare with rule prescriptions given our economic outlooks.

In particular, I do see one useful "takeaway" from Bob's presentation—not so much from the level of the rule's prescription—which I find hard to work with, because of risk-management concerns and uncertainty regarding the level of the intercept—but more from the fact that the deviation of that prescription from the median SEP path increased 50 basis points for 2018 and 2019 between the September and December meetings. And that wider gap raises the question to me whether, conditional on the other aspects of the forecast being realized, the pace of rate hikes might need to be a bit faster than is currently implied by the median dots. Of course, the answer to that question will ultimately come from the incoming data, and we will, I'm sure, remain open to moving faster or slower, depending on data and risk-management considerations. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you, Madam Chair. I support alternative B as written. With respect to the Federal Reserve Bank of New York's interest rate projections in the SEP, we've made only very minor changes relative to where we were in September. For example, we still have three 25 basis point hikes penciled in both for 2018 and for 2019.

That said, at the margin—in view of the strength of the economy, the tightness of the labor market, and buoyant financial market conditions—the risk, to me, seems to be on the side of a more rapid pace of rate hikes than that. Also, if, as we were to continue to remove monetary policy accommodation, we continue to see financial conditions remaining buoyant, that would push me to revise up my estimate of r^* and our longer-term federal funds rate forecast. But I'm not quite there yet.

I want to talk a little bit about the yield curve, so I guess I'll have the last word, or next-to-last word, on this. Some are concerned by the flattening of the Treasury yield curve. But I don't share that concern. I'm broadly where the staff is. I thought the staff's analysis today relayed by Thomas, as well as the related analysis earlier in the Tealbook, was very good. To me, first, the flattening of the yield curve should be expected when we're raising the federal funds rate target. If the yield curve weren't flattening, this would suggest that we were "behind the curve" in removing monetary policy accommodation. So this is normal, as opposed to abnormal.

Second, the yield-curve flattening is not particularly pronounced. As the Tealbook mentioned, this yield spread between the 10-year Treasury note and the 2-year Treasury note is not far from its average over the past few decades at the 40th percentile.

Third, one should expect the yield curve to be flatter than normal, all else being equal, because, as Thomas and others have pointed out, the term premiums are depressed. Now, some of this is due to quantitative easing—both our own actions and the actions of foreign central banks. But some of this may be more persistent. It may be due to the fact that we're in a low-inflation environment. If the perception of the risk of significantly higher inflation has fallen over time, as inflation has persistently undershot 2 percent, then this should result in investors' compensation for inflation risk involving lower term premiums than previously.

Fourth and finally, while an inverted yield curve has typically preceded recessions, I'm not aware of any causal element in that relationship. For example, I don't believe that banks become unwilling to lend when the yield curve inverts and that that then causes a recession. If the curve were to invert in the current environment, it would be because people thought that monetary policy was tight, and that's really the thing that precedes recession. Investors

anticipate, if monetary policy is tight, that the economy is going to slow, and that will be followed by a reduction of short-term rates. That's the mechanism that really causes the yield curve to invert. And those expectations usually turn out to be right because, if they weren't right, the Federal Reserve would keep tightening, and, eventually, it would get the desired outcome. So we do observe that inverted yield curves precede recessions, but I don't see a causal relationship in that.

In this cycle, I expect the yield curve will continue to flatten as we continue to remove monetary policy accommodation, and I expect that inversion could happen earlier than would normally be the case, because term premiums are depressed. But, to me, worrying now that we're committing a major policy mistake by raising our federal funds rate target 25 basis points, to 1¼ to 1½ percent, seems misplaced. Our tightening moves have not yet tightened overall financial market conditions, so why should we expect our actions to exert a significant restraint on economic activity even with a somewhat flatter yield curve? Thank you, Madam Chair.

CHAIR YELLEN. Well, thank you, everybody, for a very good discussion. I think everybody recognizes that we face two different risks in our policy choices—one of concern with allowing the economy to overheat, which could ultimately threaten the sustainability of the expansion, and, just as important, one of too-low inflation and, possibly, inflation expectations that are moving down, and taking actions that enhance that risk. And I've heard very thoughtful comments around the table about the need for and difficulty of weighing, judging, and balancing those risks. So I thought it was an excellent discussion.

At the end of the day, I heard considerable support for alternative B as written. So let me ask Jim to now make clear what we're going to vote on.

MR. CLOUSE. Thank you, Madam Chair. The vote will be on the monetary policy statement exactly as it appears on pages 6 and 7 in Thomas Laubach's briefing materials, and it will also encompass the directive to the Desk as it appears in the implementation note on pages 12 and 13 of Thomas's briefing materials. With that, I'll call the roll.

Chair Yellen	Yes
Vice Chairman Dudley	Yes
Governor Brainard	Yes
President Evans	No
President Harker	Yes
President Kaplan	Yes
President Kashkari	No
Governor Powell	Yes
Governor Quarles	Yes

CHAIR YELLEN. Okay. Now we have two sets of related matters under the Board's jurisdiction: corresponding interest rates on reserves and discount rates. I first need a motion from a Board member to increase the interest rates on required and excess reserve balances to 1½ percent, effective December 14, 2017. Do I have a motion?

MR. QUARLES. So moved.

CHAIR YELLEN. Thank you. Second?

MS. BRAINARD. Second.

CHAIR YELLEN. Thanks. Without objection. Finally, I need a motion from a Board member to approve establishment of the primary credit rate by the Federal Reserve Banks of Boston, New York, Philadelphia, Cleveland, Richmond, Atlanta, Kansas City, Dallas, and San Francisco at 2 percent, effective December 14, 2017. It will also encompass approval by the Board of Governors of the establishment of a 2 percent primary credit rate by each of the remaining Federal Reserve Banks, effective on the later of December 14, 2017, and the date such Reserve Bank informs the Secretary of the Board of such a request. The Secretary of the Board

would be authorized to inform such Reserve Banks of the approval of the Board of Governors on such notification by the Reserve Bank. Lastly, this vote will also encompass establishment of the rates for secondary and seasonal credit under the existing formulas specified in the staff's December 8, 2017, memo to the Board. Do I have a motion?

MR. QUARLES. So moved.

CHAIR YELLEN. Second?

MS. BRAINARD. Second.

CHAIR YELLEN. Thank you. Without objection.

Okay. Our final agenda item is simply to confirm that our next meeting will be on Tuesday and Wednesday, January 30 and 31, 2018.

This concludes the meeting. I guess many people consider 10:15 too early for lunch. [Laughter] Boxed sandwiches and salads are available in the anteroom for you to consume whenever you regard as appropriate. And there will be, for anyone who wants to stay around, a TV in the Special Library, if you want to watch the press conference, which begins at 2:30.

END OF MEETING