Meeting of the Federal Open Market Committee on
March 15–16, 2016

A joint meeting of the Federal Open Market Committee and the Board of Governors was held in the offices of the Board of Governors of the Federal Reserve System in Washington, D.C., on Tuesday, March 15, 2016, at 1:00 p.m. and continued on Wednesday, March 16, 2016, at 9:00 a.m. Those present were the following:

Janet L. Yellen, Chair
William C. Dudley, Vice Chairman
Lael Brainard
James Bullard
Stanley Fischer
Esther L. George
Loretta J. Mester
Jerome H. Powell
Eric Rosengren
Daniel K. Tarullo

Charles L. Evans, Patrick Harker, Robert S. Kaplan, Neel Kashkari, and Michael Strine, Alternate Members of the Federal Open Market Committee

Jeffrey M. Lacker, Dennis P. Lockhart, and John C. Williams, Presidents of the Federal Reserve Banks of Richmond, Atlanta, and San Francisco, respectively

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

Thomas A. Connors, Michael P. Leahy, David E. Lebow, Stephen A. Meyer, Christopher J. Waller, and William Wascher, Associate Economists

Simon Potter, Manager, System Open Market Account

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

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

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

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

James A. Clouse, Deputy Director, Division of Monetary Affairs, Board of Governors

William B. English, Senior Special Adviser to the Board, Office of Board Members, Board of Governors

Andrew Figura, Ann McKeehan, David Reifschneider, and Stacey Tevlin,[1] Special Advisers to the Board, Office of Board Members, Board of Governors

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

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

Diana Hancock and Michael G. Palumbo, Senior Associate Directors, Division of Research and Statistics, Board of Governors; Beth Anne Wilson, Senior Associate Director, Division of International Finance, Board of Governors

Ellen E. Meade and Robert J. Tetlow, Senior Advisers, Division of Monetary Affairs, Board of Governors

Jane E. Ihrig and David López-Salido, Associate Directors, Division of Monetary Affairs, Board of Governors

Stephanie R. Aaronson and Glenn Follette,[2] Assistant Directors, Division of Research and Statistics, Board of Governors

Penelope A. Beattie,[3] Assistant to the Secretary, Office of the Secretary, Board of Governors

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

Kurt F. Lewis, Principal Economist, Division of Monetary Affairs, Board of Governors

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

Kenneth C. Montgomery, First Vice President, Federal Reserve Bank of Boston

[1] Attended the discussion of the economic and financial situation through the close of the meeting.
[2] Attended Wednesday session only.
[3] Attended Tuesday session only.

David Altig, Ron Feldman, Alberto G. Musalem, Glenn D. Rudebusch, and Daniel G. Sullivan, Executive Vice Presidents, Federal Reserve Banks of Atlanta, Minneapolis, New York, San Francisco, and Chicago, respectively

Michael Dotsey, Evan F. Koenig, Paolo A. Pesenti, and John A. Weinberg, Senior Vice Presidents, Federal Reserve Banks of Philadelphia, Dallas, New York, and Richmond, respectively

Edward S. Knotek II, Giovanni Olivei, and Jonathan L. Willis, Vice Presidents, Federal Reserve Banks of Cleveland, Boston, and Kansas City, respectively

Transcript of the Federal Open Market Committee Meeting on March 15–16, 2016

March 15 Session

CHAIR YELLEN. Let's begin. Welcome, everybody. As for our past meetings, this entire meeting will be a joint meeting of the FOMC with the Board of Governors, and I need a motion to close the Board meeting.

MR. FISCHER. So moved.

CHAIR YELLEN. Thank you. Without objection. Our first order of business is "Financial Developments and Open Market Operations," and I'm going to ask Simon to start us off.

MR. POTTER.[1] Thank you, Madam Chair. I will begin by discussing global financial market developments, and then Lorie will review money markets and operational matters.

Following their worst January since 2009, global risk asset prices continued to exhibit significant volatility over the intermeeting period. The top-left panel of your first exhibit shows that the period can be divided in two. In the first half, risk assets declined sharply, generally continuing the moves seen following the turn of the year. However, since mid-February, risk asset prices have rebounded. Taking a longer view: On net, since the December FOMC meeting, risk asset prices and advanced economy sovereign debt yields are lower, while the U.S. dollar is a bit weaker.

In order to gain greater insight into the price actions seen year-to-date, we asked respondents to the Desk's surveys to rate the importance of various factors that may explain the recent financial market volatility. As shown in the top-right panel, on average respondents assigned the highest ratings to three factors: volatility in oil markets, Chinese FX developments, and changes to the outlook for foreign growth and inflation. As I will discuss in more detail in the next three panels, a reduction in heightened concerns over these factors likely contributed to the retracement in risk asset prices since mid-February, although key sources of uncertainty underlying these factors have not been resolved, and this may suggest the rebound is tenuous. Survey respondents also highlighted foreign central bank policy as a contributing factor, and, over the period, investors increasingly questioned the efficacy of monetary policy at the lower bound in certain developed market economies. I will discuss this later in

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

my briefing. Interestingly, only two respondents mentioned market psychology as an important factor, while one other pointed to reduced market liquidity.

Beginning with oil, the middle-left panel shows that oil prices fell back to multi-decade lows in mid-February, and, amid ongoing negotiations between many producers to coordinate an output freeze, prices were volatile over the period, with an intraday trading range generally between 3 and 6 percent. The wide daily swings in oil prices continued to have knock-on effects across global financial markets, and the correlation between changes in oil prices and a number of risk asset prices remained well above longer-run historical averages. Although oil prices increased over the period to roughly $40 per barrel, they're little changed year-to-date, and the outlook for them remains uncertain. On the supply side, a coordinated output freeze is only speculative at this point, while the outlook for oil demand does not appear to have materially changed. Against this backdrop, market participants continue to expect volatile trading conditions, and options on oil futures suggest price volatility will remain above its post-crisis average in the near term.

Moving to China, the stability in recent weeks in the renminbi–U.S. dollar fixing seems to have soothed market concerns. Over the intermeeting period, the onshore renminbi was little changed against the U.S. dollar, broadly consistent with movements in the basket of currencies that many Chinese policymakers describe as the new exchange rate peg. That said, many investors perceive the recent stability as only temporary, in part because it has required high levels of intervention in foreign exchange markets. The middle-right panel shows that Chinese foreign exchange reserves have declined by over $750 billion since the fall of 2014.

Despite incremental communication in February from Chinese policymakers indicating an interest in renminbi stability against a basket of exchange rates, many market participants are skeptical that this will be delivered, in light of prior abrupt adjustments to the exchange rate policy. Market participants also point to the perceived pressure from capital outflows, the ongoing opacity concerning the exchange rate regime with respect to the U.S. dollar, and the viability of such a regime. Investors still expect the renminbi to depreciate further against the U.S. dollar over the coming year, and options pricing indicates that the demand for protection against surprise renminbi depreciation is near post-crisis highs and well above levels prevailing prior to the August devaluation. Beth Anne will discuss China and oil prices further in her briefing.

While oil prices and the renminbi–U.S. dollar fixing have stabilized in recent weeks, concerns about longer-run global growth prospects or secular stagnation have not receded. The bottom-left panel shows that five-year, five-year-forward real yields in the United States and euro area continued to decline over the intermeeting period. The decline in real yields—alongside persistently low levels of forward inflation compensation—has resulted in a significant flattening in nominal sovereign yield curves, and nominal yields are at or near historic lows.

At the intersection of these three factors, the financial sector has experienced heightened volatility and significant asset price declines since the start of the year. The bottom-right panel shows that domestic and European bank stocks have been notable underperformers, as continued net interest margin compression due to flattening yield curves, energy-sector exposure, and idiosyncratic developments weighed on the sector. Concerns over individual bank earnings and escalated doubts over the ability of certain banks to meet debt obligations exacerbated the steep slide in financial-sector stocks in the euro area, Japan, and the United States. The share prices of some large banks were, at one point, 30 percent below the levels prevailing at the start of the year.

By contrast, some observers point to emerging markets, which have performed comparatively well so far this year, as an indication that financial market concerns have been overblown. However, the relatively strong performance follows sharp declines across EM assets in the second half of 2015. Further, as I highlighted with respect to China, most assume the current stability has been supported in part by active FX intervention and, therefore, question its sustainability over the medium-to-long term.

As volatility in global financial markets rose, expectations for more-accommodative monetary policies from developed-market central banks increased and have only partially retraced in recent weeks. Year-to-date money market futures rates across the euro area, Japan, and the United States have all declined substantially. Further, going into the G-20 meeting in Shanghai, there was increased market chatter about the possibility of coordinated responses across central banks and fiscal authorities as many market participants focused on the international spillover effects and efficacy of monetary policy actions at the zero bound.

At the end of January, the Bank of Japan announced a negative interest rate policy to complement its ongoing asset purchase program, an unexpected change to its policy stance, as Japanese policymakers had previously been adamantly against using the tool. Despite the attempt to provide further accommodation and a short-lived positive response in financial markets, Japanese financial conditions tightened considerably in the weeks after the announcement. The top-left panel of your next exhibit shows that the Japanese yen appreciated over 5 percent versus the U.S. dollar and Japan's TOPIX Index declined 14 percent, on net, in the two weeks after the announcement. Market participants link the moves in market prices in part to inconsistent policy communications, a complicated and unclear tiered system of interest rates on reserve balances, and more-fundamental questions about the efficacy of negative interest rate policy and the remaining capacity of BOJ policy tools to stoke inflation. Indeed, in view of the size of the BOJ's asset purchase program and the operational concerns associated with negative rates in Japan, the main tool remaining with ample capacity appears to be FX intervention.

In contrast, last week the ECB delivered a comprehensive and carefully designed package of accommodative measures, which was generally viewed as surpassing consensus market expectations. As detailed in the top-right panel, the ECB cut the rates on its main refinancing operations, marginal lending facility, and deposit facility, bringing the deposit rate to minus 40 basis points. Further, it added a new series of targeted longer-term refinancing operations, increased the pace of asset purchases, and expanded the list of eligible purchase program assets to include nonfinancial corporate bonds. Unlike the BOJ, the ECB faces self-imposed operational limits related to the share of sovereign issuance it is prepared to hold and a floor on the yields of assets it is prepared to buy. It also decided not to implement a tiered negative interest rate system, which was apparently viewed adversely by a number of market participants.

Despite the unprecedented scale of efforts by the ECB and Bank of Japan to stimulate inflation in a situation in which their policy rate has reached the lower bound, the middle-left panel shows that the forward measures of inflation compensation remain at or near multiyear lows. Following the election of Prime Minister Abe and the subsequent implementation of QQE, Japan had some success in the financial markets in raising inflation compensation. However, with disinflationary forces building in the euro area and more broadly across the globe since the summer of 2014, long forward inflation compensation has fallen even as the Bank of Japan increased its pace of asset purchases and the ECB started a QE program. In the United States, inflation swaps are trading in line with crisis-era lows, although they have shown notable increases in the past few weeks.

The cumulative result of the varied actions by the BOJ and ECB, or perhaps the inability to counteract the conditions prompting these actions, is most evident in the extremely low level of nominal yields in these jurisdictions. The middle-right panel shows that 74 percent of Japanese sovereign debt and about one-half of euro-area sovereign debt are trading at negative yields. These negative yields might be putting downward pressure on U.S. yields through portfolio balance effects. Further, it is unknown whether sustained periods of negative yields will lead to structural changes in financial systems that, in turn, reduce the effectiveness of monetary policy.

The heightened market volatility and perceptions of a fragile domestic economic outlook prompted, particularly in early February, expectations of a much more accommodative stance of monetary policy being provided by the FOMC. As shown in the bottom-left panel, the current market-implied path of the federal funds rate, the dark blue line, remains notably below the path prevailing at the time of the December FOMC meeting, a path shown in the light blue line. Market pricing currently suggests that a less than 10 percent probability is attached to an increase in the target range for the federal funds rate at this meeting, and only one rate hike is fully priced in for the remainder of 2016; the path is still consistent with a very gradual data-dependent approach, with a 50–50 chance of a rate increase at or before the June meeting. These market-implied expectations are generally consistent with the results of the most recent Desk surveys. Thomas will discuss policy expectations further in his briefing.

Following the Bank of Japan decision, market participants began to speculate that negative interest rate policy may be on the horizon in the United States, in part illustrated by a slight inversion of the federal funds futures curve on the morning of February 11, when the value of Eurodollar options that would pay off with negative rates spiked. The Eurodollar option-implied risk-neutral probability of negative policy rates in December 2016 rose from around 2 percent at the start of the year to 12 percent most recently, though it reached as high as 25 percent on February 11. Results in the Desk's surveys similarly reflect a shift in views, with 18 respondents now estimating the level of the federal funds target range or rate at the effective lower bound as less than zero, compared with only 12 in January. However, on average, respondents assign a less than 5 percent probability to negative policy rate outcomes occurring over the next three years.

Fed policymaker comments over the course of February also served to flatten the expected path of the policy rate. Market participants keyed in on comments from Vice Chairman Dudley and the Chair's congressional testimony, which were taken by some as suggesting that financial market volatility could factor into the path of policy normalization. Additionally, Vice Chairman Dudley's comments in early February that U.S. dollar strength could have "significant consequences" for the U.S. economy led to a large and widespread depreciation in the U.S. dollar, which had been continuing to appreciate despite a compression in interest rate differentials, as shown in the bottom-right panel.

Arguably, this arrest in broad dollar appreciation helped with the stabilization in global financial markets over the period, reducing both some downward pressures on oil prices and upward pressure on the renminbi fixing. A key question that remains for market participants, therefore, is the extent to which shifts in U.S. monetary policy expectations have contributed to the stabilization in global financial conditions and, correspondingly, the extent to which the current relative calm would be sustained if expectations for a faster pace of FOMC rate hikes grow or the U.S. dollar starts to appreciate once again.

MS. LOGAN. I'll begin on exhibit 3, with money markets and operational developments.

Our experience during the intermeeting period continued to suggest the operational framework has been effective in maintaining control over the effective federal funds rate. This has occurred without enlarging the Federal Reserve's market footprint or having unintended consequences on financial stability during the financial market turmoil in January and early February. As shown in the top-left panel, the effective federal funds rate continued to print near the center of the target range. I should note that since the previous meeting, we changed the underlying data source for the effective rate to the FR 2420 data and the calculation methodology to a volume-weighted median. This transition went smoothly, with little market reaction and little change in the effective rate.

Treasury repo rates traded at modestly higher spreads to the overnight RRP rate, with the overnight Treasury GCF rate, shown as the red line, printing above the target range early in the period. Treasury bill rates, shown as the light blue line, continued to rise following liftoff as a result of significant increases in net bill issuance. These higher rates on money market instruments contributed to the substantial decline in daily take-up of Federal Reserve overnight RRPs. As indicated by the dark blue line in the top-right panel, daily take-up fell, dropping on occasions to less than $40 billion, which is below what we would have expected even after taking the higher rates on alternative money market instruments into account. Market participants reported that an increase in the availability of private repo, as indicated by the increase in private-sector repo volumes shown in the light blue line, also contributed to the reduced overnight RRP facility usage.

Contacts attributed this combination of increased private-sector repo availability and higher rates to the increase in the amount of Treasury collateral that dealers needed to finance in the repo market. This increase in dealer inventory to finance, shown in the middle-left panel, has been driven by sales of U.S. Treasury securities by foreign central banks in support of realized or expected foreign exchange intervention activity, combined with the sustained positive Treasury net bill issuance, shown in your middle-right panel.

The recent increase in Treasury repo volumes and correspondingly low Federal Reserve overnight RRP facility usage appears to have influenced expectations for future usage. As shown in the bottom-left panel, the Desk's March policy surveys showed that median expectations for six-month-ahead and one-year-ahead overnight RRP facility demand declined by roughly $150 billion. However, respondents largely maintain that demand is likely to increase from current levels later this year, as implementation of SEC money market mutual fund reforms is expected to result in increased supply of cash for investment into short-term high-quality assets.

Although overnight RRP usage declined over the period, we continue to see increases in Federal Reserve reverse repurchase agreements with foreign official institutions—otherwise known as the foreign RP pool—as shown in the bottom-right panel. Recall that the vast majority of the increase in the foreign RP pool since December 2014, shown in dark blue, has been driven by one customer seeking larger dollar liquidity buffers as a precaution against potential global financial instability surrounding normalization of U.S. monetary policy. This customer's increases have occurred gradually and ended in January. A few emerging market accounts have been responsible for the growth more recently amid a desire to increase their dollar liquidity buffers either in anticipation of foreign exchange intervention activity or out of concern over Treasury market liquidity in times of stress.

With regard to the final exhibit, I'd like to update you on recent trends in the foreign exchange reserve holdings of the SOMA portfolio, a summary of which is contained in the top-left panel.

The SOMA portfolio holds approximately $12 billion in euro-denominated and $8 billion in yen-denominated investments, which are invested in sovereign bond holdings and deposits at official institutions. As shown in your top-right panel, total income from the euro portfolio has been trending lower since late 2011. Since the adoption of a negative deposit facility rate by the ECB in 2014, income earned on cash and time deposits held at euro-area central banks has been negative. With the recent further declines in euro-area rates that Simon highlighted, we expect negative overall interest income on the euro portfolio this month. In contrast, we expect income on the yen portfolio to decline toward zero but remain positive. Although yields on Japanese government bonds with maturities out to 11 years are now negative, we currently earn an interest rate of zero on our deposits left at the BOJ.

We anticipate that the negative income on the euro portfolio will fully offset the reduced—though still positive—income from the yen portfolio in April, resulting in negative total SOMA foreign portfolio interest income in U.S. dollar terms. This would be reported publicly for the first time in late May within the April financial statement of the Treasury Exchange Stabilization Fund, which the Desk manages in an identical manner to the SOMA portfolio. It would be subsequently reported in the Federal Reserve Bank of New York's quarterly report covering the second quarter and other Federal Reserve financial statements.

As we have noted previously, we are currently conducting a strategic review of the foreign portfolio investment framework. The goal of this review is to assess and improve the way in which the Desk manages the SOMA's and the Treasury ESF's foreign assets in order to better meet the investment objectives. This strategic review is being conducted in parallel with work to modernize the Committee's Foreign Authorization documents so that they reflect the current operating environment and can be more easily understood by the public. We will be providing a memo to the Committee on the results of the strategic review, including a recommended benchmark investment portfolio, in the coming weeks.

With regard to the domestic portfolio, the Desk is planning to publish the SOMA annual report in mid-April, and the Committee can expect to receive a full copy around the end of this month. In order to demonstrate the sensitivity of income to various factors such as interest rates and the composition of Federal Reserve liabilities, the annual report will include updated SOMA portfolio income projections under both a baseline scenario derived from market expectations and several alternative scenarios. In comparison with the 2014 annual report, the 2015 baseline projection shows a higher level of net income during the normalization process, as shown in your middle-left panel. This is primarily due to a delay in the expected end to reinvestments—resulting in a larger SOMA portfolio over a longer time period—combined with a lower interest rate path, which reduces expected interest expense. In the baseline scenario, the portfolio is expected to reach its steady-state size in the second quarter of 2022, nearly a year and a half later than projected in the previous report.

In terms of portfolio operations, the Desk continued to reinvest repayments of principal on Treasury securities and agency MBS. As shown in your middle-right panel, the Desk completed roughly $37 billion in Treasury rollovers in February, a sharp increase in the monthly Treasury rollovers over the prior three-year period when maturing Treasury securities totaled only $6 billion. The Desk also reinvested

$22 billion in MBS principal payments. The median respondent to the Desk's March surveys expected the Committee to first cease some or all reinvestments in June 2017—shown as the dashed line—two months later than in the January survey. A number of respondents attributed the shift to a flattening in the expected path of the target range.

Finally, we would like to review factors that may bear on the Committee's decision of whether to conduct term RRP operations over March quarter-end. In a memo sent to the Committee and summarized in your bottom two panels, the staff outlined an option to offer $250 billion in term RRPs at 1 basis point over the ON RRP offered rate, split evenly between seven- and two-day maturities.

On the one hand, conducting term RRPs over quarter-end would provide continuity, support the Committee's guidance that it expects to reduce elevated capacity in the ON RRPs fairly soon after the commencement of policy firming, and enhance operational readiness. On the other hand, because ON RRP capacity is currently more than sufficient to meet demand for RRPs over the quarter-end, offering term RRPs will not add to interest rate control. Further, there is the added albeit small interest expense of providing term RRPs at a premium to the ON RRP offered rate.

If the Committee wishes to conduct term RRPs over the March 2016 quarter-end, the instruction to conduct such operations would need to be added to the domestic policy directive, which will be included in the implementation note that is published along with the Committee's postmeeting statement. The Desk would also release an operating statement on term RRP operations on the New York Fed's website, providing the planned schedule and other details such as the allocation mechanism for the operations. The memo you received and Tealbook B show the draft language that would be added to the directive; the memo also shows the draft operating statement that the Desk would release.

To conclude, as we noted in January, as part of each FOMC briefing, we will provide a summary of the results of any small-value exercises from the prior period and preview upcoming exercises. This information is summarized in your appendix, which also notes the results of the TDF test operation performed in February.

Thank you. That concludes our prepared remarks.

CHAIR YELLEN. Thank you. Now, from my own standpoint, I'm not particularly concerned about this because, in either case, the minutes for this meeting can clarify something we have said before, which is that we intend to reintroduce an aggregate cap on the overnight RRP facility at some point, and we intend to phase out the facility when it's no longer needed to help control the federal funds rate. So, personally, this isn't something I feel strongly about. I'm happy to go along with the prevailing view of the Committee.

Before I ask for a show of hands, I'd welcome any comments that you might have. A few people have indicated a desire to comment on this, and anybody else is welcome to join in. Let me turn to the Vice Chairman first.

VICE CHAIRMAN DUDLEY. Thank you, Madam Chair. I don't think it's an earth-shattering decision. If we did one or the other, I don't think we would be putting the republic at risk. [Laughter] But all that said, I do favor the option of not doing term RRPs at the end of the quarter for two simple reasons. One, they're not necessary, in view of the fact that we don't have a cap on the overnight RRP facility. There's plenty of capacity to accommodate any quarter-end demand.

Without a cap, we clearly don't need them now, so the default should be no term RRP for the time being. Once we establish a cap on the overnight RRP facility, then we should revisit this issue. At that time we might decide to have a high cap on the overnight RRP facility. In that case, we might still expect to have sufficient headroom at quarter-end so we can safely continue to forgo term RRP, or we can decide to have a lower cap on the overnight RRP facility, which might necessitate term RRP to ensure sufficient headroom at quarter-end.

A second important reason is that I would prefer that we make the decisions in sequence. I'd have the decision on the overnight RRP cap made first. Then, once that decision was made, I would consider the implications for headroom at quarter-end, and that, then, would drive the decision on term RRP.

Now, some might view this decision not to do term RRP as inconsistent with past practice, as we've done term RRP operations consistently over recent quarter-ends. I disagree with this. In terms of communication, I completely agree with the Chair. I don't think if we forgo term RRP when we have no cap—I don't think it's going to be difficult to explain to anybody. We can make it clear why we're doing so in the minutes. We simply explain that because we don't have a cap, we don't need term RRP right now.

CHAIR YELLEN. Thank you. President Harker.

MR. HARKER. Thank you, Madam Chair. I agree with Vice Chairman Dudley's analysis. Although I think it is not putting the republic at risk, I think it's a close call, and for me there are costs and benefits, obviously, to changing or not changing. I come down on the side of the cost of changing, at least in terms of too many moving parts, until we get sufficiently on our path toward normalization. That seems to be the right thing to do.

CHAIR YELLEN. Thank you. President Lacker.

MR. LACKER. Thank you, Madam Chair. I agree with our Vice Chairman that the term RRP over quarter-end would be superfluous. I've argued that even with a potentially binding cap, it would be superfluous, but we don't have to get into that discussion today. I think changes to the program should go in the direction of parsimony rather than adding bells and whistles. From here on out, we should keep it simple and wind it down. I don't see a need to add any term RRPs even if we reduce the cap. I don't see why we'd add the term RRPs to the mix. We should just keep it simple until we wind it down.

CHAIR YELLEN. Would anybody else like to comment on this matter? Okay. On this momentous question, I'm going to ask for a show of hands. Let me start with, how many people would be in favor of no term RRPs, just use the overnight RRP? [Show of hands] Okay. I think I see 13. And how many people would prefer to offer term RRP? [Show of hands]

MR. HARKER. I'm actually—I would vote for both. [Laughter]

CHAIR YELLEN. Okay. You've got it. I think we have a strong majority in favor of no term RRP. Why don't we incorporate that into the directive, and we'll vote on that tomorrow.

Next, now we have to vote on something. We need to ratify open market operations since the January meeting. Do I have a motion?

MR FISCHER. So moved.

CHAIR YELLEN. Thank you.

MR. WILCOX.[2] Thank you, Madam Chair. I will be referring to the packet labeled "The U.S. Outlook."

A small literature in the medical field shows that in the immediate aftermath of a change to daylight saving time, one can document a variety of small but statistically significant adverse outcomes, including unproductive staring at computer screens and workplace accidents. I have experienced one of these—I'll leave you to guess which—but I hope not to have the other visited on me.

VICE CHAIRMAN DUDLEY. How about FOMC meeting outcomes?

MR. WILCOX. So far as I know, that has not been explored in the literature. [Laughter]

The first panel in your summary exhibit shows the nowcasts of real GDP growth in the first quarter of this year that have been generated around the System. The black line shows the Board staff weekly judgmental forecast, the red line tracks the daily progress of our own purely statistical factor model, and the blue dashed lines show the forecasts from the various models maintained by the Reserve Banks. Through an intermeeting period that was notable for the volatility in financial markets, the news that was relevant to these models had generally pushed them toward a rough consensus that GDP growth this quarter has been steady, if unspectacular, somewhere in the neighborhood of 2 percent.

The Board's dynamic factor model, shown by the red line, briefly became a little more pessimistic about current-quarter growth during the second half of February, but the source of that pessimism was the higher-than-expected reading on the CPI, not the gyrations in any of the financial variables that the model looks at. Since then, the late-February report on consumption expenditures and early-March employment report boosted the model estimate to about 2½ percent. For what it's worth, this model barely flinched in the face of this morning's retail sales release and took its projection down a mere 15 basis points.

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

On the judgmental side, in light of the retail sales release, we were a little more taken aback by that news, and, in response, we have revised down our estimate of GDP growth this quarter from about 2 percent—at the right end of the black line in the panel—to 1½ percent. As you can see from the chart, the 1 percentage point discrepancy between the judgmental and model estimates is relatively wide and will provide an excellent opportunity for growth and learning for at least one of us.

For now, we continue to expect real GDP growth at about a 2 percent annual rate in the second quarter. The main engine of growth in our near-term forecast continues to be private domestic final demand, which we anticipate to increase at about a 2¾ percent annual pace over the first half of this year, supported by still-low interest rates, solid job gains, lagged effects of previous wealth gains, still-favorable readings on consumer sentiment, and what we continue to estimate is a net boost from low energy prices. On the other side of the ledger, we expect a slowing pace of inventory investment to subtract about ¼ percentage point from the growth of real GDP over the first half of this year, and we expect net exports to subtract about ¾ percentage point over that period.

Fueled partly by the recent bout of turbulence in financial markets, concern has increased during the past several months that the U.S. economy might be heading for a recession. The Board's staff recently sent you a pair of memos summarizing our views. One of the memos uses a novel technique to demonstrate that, when it comes to discerning the odds of a recession in the next very small number of months, both nonfinancial and financial variables are informative. On the other hand, if the goal is to gauge the risk of recession as much as a year ahead, financial variables are more useful and nonfinancial ones not so much. As you can see from panel 2, which reproduces some of the results of this exercise, on the basis of the February data that were available as of the time that the memo was closed, the model viewed the probability that the economy would be in recession at some point over the coming year as having risen since December, from very low levels to about their unconditional mean, which, in this model, is about 15 percent (as shown by the dashed line). For what it's worth, my colleague Travis Berge was able to rerun the model this morning using updated information, and the difference in probability estimates is imperceptible. I would note, however, that different models can generate markedly different results. For example, Alessandro Barbarino showed in his briefing yesterday that a model he maintains put the probability of two consecutive quarters with decreases in real GDP as being essentially nil at present. By contrast, the *other* memo that was distributed to you last week focused on the movements in a measure of investor sentiment, the so-called excess bond premium constructed by Gilchrist and Zakrajšek, and showed that the estimated cumulative probability of the economy entering into recession sometime over the next 12 months had risen sharply and was above 40 percent in February.

In the end, our own view of where the domestic economy currently stands and where it is headed is relatively little changed from where it was in January. The two most recent employment reports point to a pace of improvement in the labor market about in line with our expectations. Folding in this morning's retail sales news, the recent indicators of aggregate spending and production have been a little below our January expectations. But the main metrics of financial market conditions that we look to in setting the medium-term projection are now a little more accommodative, on net, than at the time of the January Tealbook, importantly because the turbulence that peaked around mid-February appears to have largely gone into remission for now. Still, in our view, the events of the intermeeting period validate our assessment that the risks to our outlook for real activity remain weighted to the downside, particularly because the capacity for countercyclical monetary and fiscal policy—both here and abroad—seems more limited than has been the historical norm.

Panel 3 reproduces a new exhibit from the Tealbook that gives estimates of the short-run real natural rate of interest from three models that are currently part of the System's DSGE modeling project. The natural rate of interest is defined here as the real risk-free interest rate that would obtain in the absence of nominal wage and price rigidities. The shaded region in the panel shows the range of estimates across the three models, while the solid line gives the median. In the wake of the Great Recession, all three models see aggregate demand as having been hit by adverse shocks that pushed the natural rate into negative territory; the effects of those shocks have been wearing off, but only slowly. For the past few quarters, the median estimate has hovered right around zero. Over the next several years, however, the median estimate of the short-run real natural rate from these models rises very gradually, reaching about 1 percent at the end of 2018.

The next two panels provide an overview of the medium-term outlook for real activity. As you can see from panel 4, our forecast of real GDP growth is marginally weaker in the near term but a shade stronger in 2017 and 2018, mostly because of the improvement in overall financial conditions since January.

As shown in panel 5, our unemployment rate projection is almost indistinguishable from the January Tealbook through late next year but creeps a little lower in 2018, reaching 4.3 percent at the end of that year, three-tenths below our January forecast. Part of this downward revision reflects the slightly stronger GDP growth in 2017 and 2018, but part also reflects the fact that in this round we reduced our estimate of the natural rate by one-tenth, to 5 percent, which lowered our projected path for the actual unemployment rate an equal amount.

The panels on the next page summarize the inflation forecast. As you can see from panel 6, we marked up our projection for total PCE price inflation in the first half of the year. About half of this revision reflects a higher projected path of energy prices, while the remainder mainly owes to the fact that—as can be seen in panel 7—the January reading on core inflation came in higher than we expected. This upward surprise to core inflation was largely attributable to several erratic components—including the nonmarket component—where price changes in a single month have historically carried little signal about future inflation. In addition, due to the residual seasonality that is present in the data, we tend to discount high core inflation readings that we see in the first part of the year. Finally, the January jump in core goods prices that we saw seems difficult to square with declining import prices. In light of these considerations, therefore, we left our core inflation projection beyond the near term about unrevised. Tomorrow morning we will receive the February CPI report, which, together with today's PPI data, will give us a better—but still incomplete—idea of what PCE price inflation was last month.

Panels 8 and 9 reproduce two exhibits from the new inflation monitor that we intend to include regularly in upcoming Tealbooks. Thus far, as indicated by the black lines in these two panels, we still have made only small revisions to our total and core PCE price inflation projections since December. The upside surprise in the core inflation reading for January shows up in panel 9 as the yellow-shaded box in the stack for 2016; as you can see, we have neither extrapolated that surprise forward nor assumed that it will be reversed. We have revised down our forecast of core inflation in 2017 and 2018 by about one-tenth since December, partly because of the small adjustment that we made this round to our estimate of underlying inflation. As we discussed in a memo that we sent to you earlier this month, some market- and survey-based indicators of longer-term expected inflation, such as the Michigan survey's measure of longer-term expected inflation shown in panel 10, have moved down noticeably over the past couple of years. In light of the accumulation of evidence since we last adjusted our assumption regarding underlying inflation in June 2014, we judged that a small downward adjustment of 5 basis points better balanced the risks.

Finally, as Alessandro noted in his briefing yesterday, the latest data provide little sign of labor compensation having accelerated. Under our interpretation of wage dynamics, which was discussed in a memo that you received last fall, the relatively flat contour of hourly compensation growth in recent years is attributable to a slowdown in trend productivity growth that has largely offset the effects of a continued reduction in labor market slack. Over the medium term, we continue to expect that compensation gains will pick up gradually.

Beth Anne will continue our presentation.

MS. WILSON.[3] Thank you. I'll be referring to the materials titled, cleverly, "The International Outlook."

Financial markets have taken us on a wild ride since your December SEP round, and many of the twists and turns along the way have been foreign. Much of the market stress appeared to reflect underlying concerns about the pace of global growth. Is the Chinese economy slowing sharply? Did the dropoff in oil prices reflect a collapse in global demand? Has monetary policy lost its mojo? Against this, we received a steady stream of economic data that, while not brilliant, didn't signal an acute dropoff in performance.

That said, as seen in panel 1, we have again been surprised on the downside. In December, we were expecting some moderation in Q4 foreign growth. In the event, the step-down was somewhat greater than anticipated. Interestingly, it was not

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

concentrated in the emerging market economies, or EMEs, where, except for a few cases like Brazil, growth, though unspectacular, held up fairly well, including in emerging Asia. Instead, our Q4 misses were concentrated in the advanced foreign economies, or AFEs, where we saw sharp dropoffs in Canadian and Japanese growth and less momentum in Europe than we had been anticipating.

We have taken some signal from this weakness in putting together our forecast for this year. In particular, although we appreciated the irony in previous forecasts of Europe being a relatively robust part of our outlook, we have now revised down our projection for the euro area and the United Kingdom noticeably. The revision reflects recent incoming data and greater financial stresses, especially in the banking sector. In addition, we have built in some drag that arises from rising political uncertainty, including the risk of "Brexit."

In assessing the strength and risks to the global outlook, we wrestled with how to interpret the Sturm und Drang over the Chinese exchange rate, the volatility in the price of oil, and concerns about the efficacy of monetary policy.

The depreciation of the renminbi against the dollar (the black line in panel 2) and clumsy communication by Chinese authorities in early January reverberated negatively across global markets, and markets were calmed after the Chinese restabilized the renminbi against the dollar and, effectively, against the trade-weighted basket (the red line). We had not bought into the view held by some that the earlier renminbi weakening signaled a collapse in Chinese growth. We do, however, have Chinese growth slowing from almost 7 percent last year to 6¼ percent this year and 6 percent in 2018. Over the next year, we assume the Chinese achieve a relatively flat path for the renminbi against the dollar and the basket. This currency forecast reflects several factors: recent communications by authorities that have stressed the goal of exchange rate stability, waning outflow pressures as repayment of external debt winds down, China's significant foreign exchange reserves and huge current account surplus, and authorities' recognition of the economic and credibility costs that would follow from a disruptive devaluation. But, as Simon has pointed out, there are downside risks to this exchange rate forecast, especially if growth does not pick up after this quarter.

This stability of the renminbi contributes to our forecast of a stable dollar, shown in panel 3. After appreciating sharply in early January on flight-to-safety flows, the dollar has depreciated against most currencies despite significant easing by AFE central banks and as concerns about global growth have lessened. On net, these moves have left the value of the broad real dollar remarkably little changed since December. For the period ahead, we see the dollar appreciating against the AFE currencies as markets are surprised by the extent of monetary policy divergence between the United States and other advanced economies. This appreciation is almost fully offset by some dollar depreciation against the EME currencies.

The early-year market tailspin was also fueled by concerns about a lack of floor on oil prices, as both spot and far futures prices (panel 4) fell sharply further.

Although spot prices have recovered, far futures prices remain down since December, signaling that market participants expect very low oil prices to persist. Much of the volatility of late seems to be linked to news on supply, including incoming data showing rising inventories and robust production, and the waning and waxing—possibly waning—of OPEC members' willingness to commit to production limits. Even so, swings in oil prices have been strongly positively correlated with U.S. equity prices and forward inflation compensation. This elevated correlation appears to be importantly reflecting a greater sense of uncertainty about the global outlook.

In our baseline, we assume that oil prices follow the futures path, rising ever so slightly over the forecast period but following a lower trajectory than in December. This lower trajectory led us to shift down our near-term growth forecast for commodity-producing countries—in particular, Canada and Mexico—but still supports the broad recovery of growth abroad.

The fact that oil prices are not expected to fall further also contributes to our expectation of a gradual rise in global inflation (panel 5). That said, the inflation environment looks more concerning than before: We have a somewhat weaker outlook for growth; inflation data have disappointed in some AFEs; and there has been a downshift in market-based measures of inflation compensation, which we are not willing to wholly discount. Although we might expect central banks to look through the decline in energy prices, these other developments have spurred greater monetary policy accommodation in Japan and Europe, as discussed by Simon, and since December we also built in more accommodative future policy—with a more gradual rise in rates for Canada and the United Kingdom (panel 6), some additional easing by the Bank of Japan (not shown), and a much larger balance sheet for the ECB (panel 7).

However, the adverse market reaction in the wake of the Bank of Japan's shift into negative interest rates, the Riksbank's further cut into negative territory, and the most recent ECB announcements have raised questions about the effectiveness of further monetary policy easing. As Simon detailed, in the aftermath of the BOJ announcement in late January, the yen appreciated, inflation compensation measures fell, and bank equity prices plunged. In the case of the ECB, press conference comments by President Draghi ruling out further rate cuts led equity prices to decline and bond yields and the euro to rise. That said, to borrow from Mark Twain, we think reports of the death of monetary policy have been greatly exaggerated. Although the market reaction has been disappointing, it is premature to judge the outcome of recent actions. Part of the negative response to the BOJ's decision appears to reflect the fact that participants were caught off guard by earlier BOJ statements ruling out negative rates and were thus left scrambling to adjust. And the ECB appeared to undermine the strength of its actions by seeming to limit itself for the period ahead. Financial markets have been quite volatile, and these initial reactions may fade. Even traditional monetary policy takes time to transmit, and it will take some time to understand and adjust to these more unconventional polices. But the experience has been a cautionary one. In the face of continued tepid growth and persistently low inflation, central banks are being stretched to design ever more complex and experimental policies that pose increasing challenges in terms of communication, implementation, and transmission.

Should monetary policy tools prove to be weaker than we anticipate, the costs of a downturn become greater. As discussed in your next exhibit, in the forecast we took a stand that the adverse market moves earlier this year were not a harbinger of a sharp step-down in global growth. But we would not completely discount such fears. In particular, in the Tealbook, we present estimates of recession probabilities for the world economy on the basis of indicators of global macroeconomic activity and financial market conditions. As outlined for reference in panel 8 and shown in panel 9, our estimated probit model appears to signal the cyclical slowdowns in the world economy since the 1970s, showing increases in the estimated probability ahead of recessions. Because of the deterioration in macroeconomic and financial conditions through February, the estimated probability of recession has risen, pointing to downside risks to the global outlook.

In the Tealbook, we looked at the implications for the United States of a global recession with and without effective foreign monetary policy actions. As described in panel 10, in both scenarios, foreign economies experience sharply tighter financial conditions and declines in confidence, and foreign central banks respond with monetary stimulus. In the first scenario, policy stimulus both boosts domestic demand and depresses the value of the currency. As seen by the red line in panel 11, despite this stimulus, foreign GDP growth falls to 1 percent, compared with around 3 percent in the baseline. As a result, the broad real dollar (panel 12) rises 4 percent, and U.S. growth (panel 13) slows, leading to a somewhat lower trajectory for the federal funds rate (panel 14). In the next scenario, measures implemented by foreign central banks prove ineffective at stimulating domestic demand, with the boost to GDP coming through the exchange rate. In this case, foreign GDP growth falls into negative territory, and the broad real dollar appreciates almost 9 percent. Consequently, U.S. real GDP growth slows to below 1 percent, and the federal funds rate follows a much shallower path than in the baseline.

So what do we make of all this? The wild ride I alluded to at the beginning has, in many respects, left us close to where we started, but changed for the journey. We are a bit more uncertain about the trajectory of the global economy; a bit more unsettled about the path for global inflation, including how well anchored inflation expectations are; and a bit more wary about the efficacy of monetary policy abroad to achieve its targets.

Thank you. Bob Tetlow will now proceed.

MR. TETLOW.[4] Thank you, Beth Anne. I will be referring to the packet labeled "Material for Briefing on the Summary of Economic Projections."

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

Exhibit 1 summarizes your economic projections, which, as you know, are conditional on your individual assessments of appropriate monetary policy. As shown in the top panel, a substantial majority of you project that real GDP growth this year will be at least a bit above your assessments of its longer-run rate and anticipate real output to either grow at about the same pace in 2017, or to decelerate, before converging toward its longer-run rate in 2018. Overall, the medians of your projections for real GDP growth this year and next are a bit above the median projection of 2 percent growth in the longer run. As shown in the second panel, all of you see the unemployment rate declining to, or below, your estimate of its longer-run value by the end of this year, and most of you expect the unemployment rate to decline somewhat further in 2017. As can be seen in the third panel, on the heels of headline PCE inflation of just 0.5 percent last year, the median of your projections moves up to 1.2 percent in 2016 and 1.9 percent in 2017. Most of you project that headline PCE inflation will reach the Committee's objective by 2018, and all but three of you expect inflation, in that year, to be within 0.1 percentage point of 2 percent. As the bottom panel shows, almost all of you expect core inflation to increase gradually over the course of the next three years.

Exhibit 2 compares the medians and ranges of your current projections with those in the December Summary of Economic Projections as well as the March Tealbook. As can be seen in the top panel, your median projections for real GDP growth in 2016 and 2017 are 0.2 percentage point and 0.1 percentage point lower, respectively, than in December. Most of you revised down projected growth this year. Only a few of you anticipate some making-up of this shortfall in subsequent years. As the second panel shows, the median of your forecasts for the unemployment rate is a bit lower in 2017 and 2018 than in December. However, many of you also reduced your estimates of the longer-run normal rate of unemployment, and, thus, although a dozen of you expect the unemployment rate to undershoot its longer-run level this year, that is fewer of you than was the case in December. Even so, the median of your unemployment gaps for this projection is the same as in December.

Many of you made substantial downward revisions to your projections for total PCE inflation this year, leaving the median projection, shown in the third panel, down 0.4 percentage point from December's value. In contrast, most of you did not change your projection for total PCE inflation at longer horizons. This in part reflected, as several of you noted, an expectation on your part that the effects of lower oil prices would fade. As indicated in the final panel, the median path for core PCE inflation was little changed from December. For both inflation measures, the medians of your projections are a bit above the staff forecast, as has been the case for some time now.

Exhibit 3 provides an overview of your assessments of the appropriate level of the federal funds rate over the forecast horizon and in the longer run. The medians of your funds rate projections, indicated by the red lines in the top panel, stand at 0.9 percent at the end of 2016, 1.9 percent at the end of 2017, 3.0 percent at the end of 2018, and 3¼ percent in the longer run. Since December, most of you have revised down your projected path for the federal funds rate over the next three years. Seven participants reduced their estimates of the longer-run federal funds rate by

¼ percentage point, and no participant raised his or her projection of the appropriate level of the federal funds rate for any forecast date. Among the reasons you cited for a more gradual pace of increases in the federal funds rate were a tightening in financial conditions since December, lower energy prices, and reductions in your estimates of longer-run growth or the longer-run normal unemployment rate. Almost all of you project that, at the end of 2018, the appropriate level of the federal funds rates will still lie below your individual judgments of its longer-run level.

The red diamonds in the upper panel of exhibit 3 show the medians of interest rate prescriptions based on a non-inertial Taylor (1999) rule, taking as given your projections for core inflation, the unemployment gap, and the longer-run nominal federal funds rate. Comparing these to the same chart for December, displayed in the lower panel, shows that the median prescription for the end of 2016 shifted down 60 basis points, about the same as the shift in the median of your federal funds rate projections. By contrast, for 2017 and 2018, the downward revisions in the federal funds rate prescribed by the Taylor rule are small to negligible and notably less than the reductions in the median of your projections.

Exhibit 4 shows your assessments of uncertainty and risks surrounding your economic projections. As shown in the figures to the left, your views regarding uncertainty have not changed in a material way since December. Almost all of you judge the level of uncertainty about your individual projections for GDP growth, the unemployment rate, and inflation as broadly similar to the average levels over the past 20 years. In contrast, your assessments of the risks to GDP growth, the unemployment rate, and both headline and core inflation have shifted adversely since December. As shown in the panels to the right, about half of you now see the risks to real GDP growth as weighted to the downside—up from just three in December. Four of you now see risks to the unemployment rate as skewed toward higher unemployment—two more than in December—while two of you continue to see risks weighted toward lower unemployment. Your explanations pointed to favorable labor market news over the past three months as a reason why the increase in pessimism regarding the risks to unemployment was less widespread than for real GDP. You also cited financial market and global economic conditions, on their own or coupled with the limited capacity—or willingness—of policymakers to respond to economic disturbances, as part of the reason for the change in your assessments of risk. On inflation, 11 of you indicated that the risks to your headline inflation forecasts are skewed to the downside, up from 7 in December; all but 1 of you saw the same tilt to the risks for core inflation. Many of you noted the deterioration, or an absence of improvement, in indicators of long-term inflation expectations as contributing to increased downside risks for inflation, while some pointed to the further declines in energy prices.

For the remainder of this briefing, I will build on material in exhibit 4 by reviewing the history of your assessments of uncertainty and risks, beginning with the first SEP that included your assessments of appropriate policy in January 2012. Exhibit 5 shows a diffusion index of your assessments of uncertainty by projection date. The index is constructed as the fraction of respondents who said that uncertainty at the time was higher than the average level over the previous 20 years, minus the fraction of respondents who said that uncertainty was lower. Several observations are worth noting. First, participants have never collectively judged uncertainty for any variable to be lower than average. Second, assessed uncertainty regarding real GDP growth and the unemployment rate began at high levels and has been largely on a downward trend since. For the two inflation measures, you were less unified in viewing uncertainty as high initially, and the subsequent decline in the indexes was not maintained, presumably because of a sequence of oil price declines beginning in mid-2014. Finally, uncertainty surrounding headline and especially core PCE inflation forecasts has undergone a modest rebound in the past two years, with the rebound in uncertainty regarding core inflation occurring even though downward pressure on prices was arguably contained within noncore prices, and labor market conditions had continued to improve.

Exhibit 6 provides a similar exercise for the risks associated with your forecasts. Over the period shown, risk perceptions have nearly always been skewed to the pessimistic side. But whereas the pessimism for real variables has diminished over time, or at least until 2015, the opposite has occurred for inflation. Your assessments for both headline and core PCE inflation, which in 2012 showed roughly no skew, have turned somewhat pessimistic over the past several years. Of note, some of this degradation in risk assessment coincided with a period of stronger-than-potential output growth and above-trend employment gains and started before oil prices began their marked decline in mid-2014. The indexes differ very little across the two inflation measures, suggesting that some participants have regarded risks emanating from noncore sources, such as energy prices, as affecting the risks to both core and headline inflation in a similar fashion.

Thank you. That concludes our presentations. We welcome your questions.

CHAIR YELLEN. The floor is open for questions for any of the presenters. Okay, let me start off with a question for David on consumer spending and your reaction to this morning's retail sales release. You said that the judgmental forecast has had a very substantial downward revision. It looks like a larger downward revision than seen in other comments this morning. You also mentioned, I think, that the Board model doesn't react very much, or substantially less. Could you talk a little bit more about that data release and what you saw in it that led to such a significant change?

MR. WILCOX. In the current quarter, our basic approach is to attempt to mimic, as much as possible, the construction methods that the BEA will use in putting together GDP.

We're trying to process the information in a parallel manner to the way that the statistical agency will use it to put together the GDP estimate. We're attempting to, for example, build in an assessment of serial correlation. So, for example, there is a slight tendency of big moves in one direction in retail sales to be a little bit offset in subsequent months, so our reaction on the judgmental side takes that into account. It's not very large.

The main surprise here in this morning's release is not actually the estimate of growth in February. It's the January estimate, which was totally extraordinary. I didn't mention in my remarks that, according to our sector specialist, that revision was in the leftmost 1 percentile of revisions of retail sales from the prior month. So it was really a very large, very unusual statistical event.

The revisions were quite widespread across categories of spending. They were in general merchandise stores, in the personal and health-care areas, and in food services, so it wasn't that there was an anomaly in one particular area. We took our judgmental estimate down about ½ percentage point, and the statistical black box model that I referenced took it down about 15 basis points, so by about one-third as much.

We're still, to be honest, gaining experience with how that model reacts. One of the reasons why I was interested to show it is that it does have a little greater variance, actually, as you can see in that top panel, in its release revisions over this one episode than the judgmental process has. I don't know at this point which is going to prove more accurate. The sad fact of the matter is that both its estimate and ours are well within the 70 percent confidence interval. I think it does suggest that the momentum of aggregate demand was just a little bit less than we had thought in our Tealbook projection. Whether it's just a tiny bit, as the model suggests, or more substantial, as our judgmental operation would suggest, is yet to be seen.

I think that's about what I know at this point. I have no reason to discount the retail sales reading. The second estimate is based on a much wider sample of selling institutions than the first one is, so it should be a more complete estimate. But, as I say, there is a fundamental puzzle. This was a very big revision.

CHAIR YELLEN. You're assuming that services is also moved down?

MR. WILCOX. No, we made no adjustment to the services. The retail sales release only covers goods that are sold through stores.

CHAIR YELLEN. But you get that big—

MR. WILCOX. We get that big of a reaction just from this.

CHAIR YELLEN. Just from this.

MR. WILCOX. That's right. As I say, it was a very big event, statistically speaking.

CHAIR YELLEN. Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you, Madam Chair. I have a question for Beth Anne, or an observation that you could comment on. In exhibit 2, chart 9, you show a relatively high probability of recession. You also express your worries about the effectiveness of monetary policy. We've had chronic misses on the foreign growth outlook over the past few years. So it raises the question, do you think we are too optimistic about the growth forecast in exhibit 1, or do you think that that's the modal forecast and there's a big skew in terms of probability density to the downside? That's the question. And I have a little trouble reconciling chart 9 with the idea of accelerating global growth. Should I have that problem?

MS. WILSON. We will always be worried about global growth. So it's true, we have had serial downward revisions, and I personally think it is probably more risk skewed to the downside than it is to the growth trajectory. But it is harder and harder to tell stories on the upside of what the risks could be. One of them might be that over this time, part of our downward revision has come because we have underestimated the costs of low oil prices on oil-producing economies, especially Canada and Mexico, which have a very high trade weight for us. Research that we have done here and that others have done has suggested that it could be that the boost to consumption is delayed, and that we should be seeing that. So we view that as one upside risk to our forecast.

And then, to look at the elevated probability, that's come down a little bit with the more recent data that we've gotten, including some good IP data from the euro area today, and some diminution of financial stresses, but it still remains high. One reason it might be elevated is because we look at that estimate using an average across the whole period for global growth. If you have, like you suggested, some secular trend down in potential output in these economies, that may be overindicating a recession when we are seeing lower growth. That said, the growth we got in 2015 on average was very, very low for the global economy, and it's hard to imagine that it would stay that low.

VICE CHAIRMAN DUDLEY. I, for one, found your presentation pretty sobering.

CHAIR YELLEN. President Williams.

MR. WILLIAMS. Thank you, Madam Chair. I have a couple of questions on the outlook and the presentation of the outlook for David Wilcox. One is on the inflation data. In reading the Tealbook and listening to your presentation, you put in a word of caution about overinterpreting the January PCE price index reading. I am reminded of a comment that Governor Brainard made at the U.S. Monetary Policy Forum, which I thought was a great way to say this: that we want to be data dependent but not data-point dependent—so, very much in the spirit of that. I get the fact that we should be careful, that this could be noise. However, I am looking at all of the 12-month changes, and some of the arguments you gave were about residual seasonality. So, 12-month changes may be minimizing some of that. I am also looking at core and other trimmed means, and things like that, which, again, are designed to smooth on the cross-section and on the time dimension here. And when I look at the past 6 months or the past 12 months, it doesn't matter how you look at this—over the past 6 months, core PCE 12-month changes is up four-tenths, market-based core PCE is up five-tenths, and trimmed mean is up three-tenths. Over the past 12 months, it is even larger.

So, how do I put these two together? It seems like you were telling stories about noise in the data versus the idea of "no matter how I clean the data up over the time dimension or cross-section, I kind of get the same answer." That is my first question.

My second question is on labor markets, so maybe it would be good to do that one first.

MR. WILCOX. Maybe I better get this one off the stack. So there has been some pickup across inflation measures, just as you suggest, but we think it is likely to recede in the near term some. Let me just give you one example, and our analysts have parsed this at a very fine level of detail. A notable element of the upward surprise in January, just to give you a little bit of a flavor of the general kind of feeling that you come away with, is that jewelry prices, which is an utterly tiny—

MR. WILLIAMS. It's a huge part of my spending. [Laughter]

MR. WILCOX. I am sure. You hide it well. [Laughter] Jewelry prices increased 4 percent in one month, not at an annual rate, but they were flat over 2015. If I showed you a picture and asked you what piece of data didn't fit, that would jump out.

Now, there is always a danger of making excuses for the pieces of evidence that are inconvenient, and there is a chance that that's going on here. The pattern of the past few years is that we have tended to get upside surprises in the first half of the year. Last year was the first year when we resisted being overly sensitive to those upside surprises in the first half of the year, and that turned out to be the correct judgment. In the prior years, we revised up our estimate, and, retrospectively, that turned out to be a mistake.

Alessandro showed, I thought, quite a striking panel yesterday—I don't know whether you had a chance to take a look at the briefing—that showed the monthly price increases by month over the past 10 years. There is really quite a strong pattern that documents the claim of residual seasonality. Now, you might say, well, if you knew about the residual seasonality going in, you shouldn't have been surprised ex post. And that would be true on average, but it turns out that the timing of when it shows up by month is also quite variable. Last year, I believe, if memory serves, it was the second quarter that was higher than normal. So it is, at this point, a hypothesis. It is nothing we can prove that we shouldn't adjust upward, but it is a hypothesis that is founded on the evidence and the experience of the past few years and supported by the examination of some of these detailed price increases.

MR. WILLIAMS. That is a perfectly reasonable response. But on the 12-month changes—your story is very subtle, then, about residual seasonality. Because if you do 12-month changes, you don't have residual seasonality. So it is really maybe more about, as in the briefing, that this varies over time, and so there may still be some leakage into the data. But that's something we will get a better picture on in the next few months, I am guessing.

MR. WILCOX. That is correct.

MR. WILLIAMS. Okay. My second question is really more of, I think the staff needed a little help with thinking about some upside risks to the outlook, on the basis of my reading of the Tealbook. You know, if you would come to California more often, you will feel better. It's sunnier. It will help you there. One of the scenarios that I was struck by in the Tealbook is actually related to productivity growth. You have productivity growth output per hour this year of 1.7 percent. I am just reading off the table. Last year it was about—a little more than 1 percentage point slower than that, roughly ½ percentage point.

If we were to generate the 2 percent, 2¼ percent GDP growth that we are penciling in and we did a replay of productivity growth last year of about six-tenths—so 1 percentage point less productivity growth than in the Tealbook—where would the unemployment rate be at the end of the year, all else being equal? I am just trying to think through—last year one of the big reasons the unemployment rate fell 0.6 percentage point is that we had essentially no productivity growth. And you all have a very big rebound in productivity growth coming this year.

MR. WASCHER. So let me try to do this in my head.

MR. WILLIAMS. Well, knock off 1 percentage point of productivity growth.

MR. WASCHER. Let's see. I am guessing that would be roughly another ¼ percentage point off the unemployment rate, if I am doing it in my head correctly. So it would be down about 4 percent—but not next year. So next year we would be down around—we have 4.8 currently, so we would be down closer to 4½ percent on your counterfactual, I think.

MR. WILLIAMS. So the total decline would be around ½ percentage point. You have a little bit of pickup in—

MR. WILCOX. I am going to be a little more disagreeable than that and question—the math of what you suggest is absolutely correct. I think the plausibility of the experiment—it feels to me like an artificial experiment to hypothesize that we would get the same GDP growth with that much lower productivity.

MR. WILLIAMS. But we did that last year. We had 1.9 percent GDP growth. We had 0.6 percent productivity growth. I am just saying, if we relived the big data of last year, we would have an unemployment drop of six-tenths. It is not implausible. We did it last year.

MR. WILCOX. It is not implausible. I don't think it's the most likely—

MR. WILLIAMS. Sure. No, I was just trying to think through the scenario.

MR. WILCOX. Right. I don't think it is an evenly balanced probability outcome. I think that's a tail hypothesis. It's an upside risk.

MR. TARULLO. That is what I thought President Williams was saying.

MR. WILCOX. Yes.

MR. WILLIAMS. We had four years of productivity growth of essentially zero. So it doesn't seem that implausible.

MR. WILCOX. Yes. Let me elaborate a little bit on what I'm thinking. For example, next Tealbook we are going to have one of our alternative view franchises, another installment in that, that will point out that, just as you suggest, we have been repeatedly disappointed, gravely disappointed, to the downside, and arguing that maybe we ought to hypothesize a much worse productivity outlook. Now, if we were to adopt that, and we may well move in that direction, we would also move our projection for actual GDP growth down significantly as well. That's the basic point I'm getting at.

MR. WILLIAMS. Thank you.

CHAIR YELLEN. President Bullard.

MR. BULLARD. Thank you, Madam Chair. I have several questions. The first one is on the U.S. outlook—panel number 2, "Recession Probabilities at Various Horizons." During your presentation of this, you said, despite what I think this picture says, that you thought that the recession risks were weighted to the downside. So let me give you a different interpretation of this picture.

These recession probability models actually did fairly well in the 2006–07 time frame, as they did signal that something was amiss in the U.S. economy, and our subsequent recession actually occurred. And I would interpret that as being that the recession probabilities went up to, say, 30 percent when the unconditional probability is about 15 percent. Now, if you look at the current situation, we are either below the unconditional probability or at the unconditional probability. So if you just wanted to use these recession probability models to say what the risks were, maybe a sensible thing would be to say, well, we are about where we expect to be in terms of recession probability.

MR. WILCOX. I think that would be fine as far as the information that's available to this model. What this model doesn't know is anything about the capacity of fiscal policy or monetary policy to combat an adverse shock, and that's the basis for our assessment in the Tealbook that the risks are weighted mainly to the downside for real activity. This model also doesn't know anything about the slower trend growth of real output.

MR. BULLARD. Yes. Well, the recession definition maybe changes if you have a different growth rate. Obviously, a more slowly growing economy would have—

MR. WILCOX. I don't know how the NBER will handle their determination of what constitutes a recession.

MR. BULLARD. Okay. I want to turn to the international outlook panels 8 and 9, which Vice Chairman Dudley has already referred to. I want to learn more about this. It says "world recession defined as countries comprising two-thirds of world GDP in recession." Do we literally mean two-thirds of the GDP in the world has had two consecutive quarters of negative GDP growth? I think that's not what you mean, but—

MS. WILSON. We use the Economic Cycle Research Institute dating methodology. It does a sort of NBER-esque dating methodology rather than two consecutive quarters of negative growth, but they're fairly similar. This database covers 22 countries. We actually looked at a few more. But what it does is, we define a world recession as occurring when countries representing two-thirds of world GDP are classified as being in recession by this database's definition.

MR. BULLARD. Right. If China is one of those countries, does it mean China is actually shrinking, or does it mean China is growing at 3 percent?

MS. WILSON. I actually don't know how they do China.

MR. BULLARD. Well, for the ones I've seen, it really amounts to saying global growth slows to, say, below 2 percent.

MS. WILSON. So this is a way of capturing that. Because if the world is in recession, it will pull Chinese growth down as well to levels that we could consider, given its potential, to be weak.

MR. BULLARD. But two-thirds of the countries are not really in recession in the conventional sense as defined inside the United States.

MS. WILSON. To the extent that this mimics the NBER dating process, it would be the countries comprising two-thirds of world GDP, not two-thirds of the countries in the world.

MR. BULLARD. Also, why not just define it as a certain—some global growth rate that you want to call recession, and put a dotted line there?

MS. WILSON. This is one way of doing that. There are different ways of doing that, and we also did some robustness checks. We did a two-thirds measure. We looked at it if it were 60 percent. We looked at it if it were 70 percent. The probability of recession changes, but also the sort of unconditional probability changes, and what you observe in each of those cases, if you varied the definition, was an increase in the probability.

MR. BULLARD. Well, I guess another way to say this—I'm looking at these shaded regions back here, 75, 80, and so on. Global growth has not been negative, except, I think, for a single quarter. So what are these shaded regions indicating?

MS. WILSON. Those shaded regions are regions in which countries comprising two-thirds of the world's GDP are calculated as being in recession. So global growth is—

MR. BULLARD. What is the world GDP growth rate in these shaded regions? I say that it's still positive.

MR. POTTER. Per capita is the issue, I think, a little bit. While countries are growing, population—

MS. WILSON. Yes, it goes back to your question about, is 3 percent for China basically a recession or not.

MR. BULLARD. Exactly.

MS. WILSON. It's not negative. I think we're answering your question in the sense that, no, global growth in some of these cases may not be negative.

MR. BULLARD. I just didn't want the impression to come out to the Committee that global growth is going to shrink with high probability, according to this model, which says 48 percent of a chance of recession.

MS. WILSON. Right. So I wouldn't read this as a literal 48 percent. There are ranges around it reflecting uncertainty. What I would take away from this is that the probability of recession is higher than it would be unconditionally, that economic conditions are suggestive.

MR. BULLARD. I took the black line here to represent the unconditional probability, which looks like 18 percent. The horizontal black line.

MS. WILSON. It's 16 percent, yes.

MR. BULLARD. This number is high. This number is quite high.

MS. WILSON. Right, and there are a numbers of reasons why. It could reflect some sort of structural slowing in growth, which we're not accounting for. But one of the issues is that last year, growth was very weak, unusually weak. Growth as weak as it was globally last year has occurred very few times outside actual recessions or crises.

MR. BULLARD. Well, I've complained about this before for this Committee. I don't think you should come with a recession probability model to this Committee that hasn't been vetted. There's a lot of ways to do these things. There's a lot of ways to cut this data, and this looks like a very scary number. So I'm not sure you should—

MR. POTTER. We asked the dealers and the buy side what they think about the probability that the global economy would be in recession six months from now using the IMF definition. The probability has moved up since we've been asking the question and is just over 20 percent. So that's in the ballpark of this estimate. That's just a subjective one, but it has moved up.

MR. BULLARD. Well, if you want to come to the Committee, come with a memo that summarizes 10 different models of global recession probabilities—and show me how the assumptions matter, something like that.

CHAIR YELLEN. President Rosengren.

MR. ROSENGREN. A lot of this meeting is about how we think about volatility. The stock market isn't dramatically lower than it was at the beginning of the year, and if you look at both the Tealbook forecast and the SEP submissions, we have an unemployment rate that's a little bit lower than what we had before. We have an inflation rate that's roughly the same, and yet we've moved our interest rate projection over the course of this year by a fairly substantial amount. So it looks like the volatility wasn't enough to have dramatically changed our real economic outlook—it doesn't enter the model. A Taylor rule doesn't have volatility in it, so it would be looking just at the inflation and unemployment you're looking at.

How should we process volatility if nothing changed but the mean? One way to think about it is, the risks have changed, but we're looking mostly at modal forecasts of the real economy. And I'm wondering whether our models should be incorporating that volatility, or should the discussion be more about risks that are implied by that volatility? Do you have any views in terms of how to think about volatility, both in terms of modal and then thinking about tails of the distribution, maybe?

MR. WILCOX. Some, but not great. The most direct channel by which volatility enters our baseline projection directly is in our investment projection, in which we have spreads making a modest but noticeable negative contribution in this round relative to previous rounds. We're able, with some effort, to get spreads to enter modestly negatively in our equations for business fixed investment. This is an area, as you know, where there's a very large amount of active research going on. In mid-February, we put out an update to our forecast that had a much more significant downward revision to the outlook on the basis of the volatility that we thought was prevailing at that time.

Now, what remains in the Tealbook is a pretty small shadow of what we showed in February for a couple of reasons. One is, as I mentioned in my prepared remarks, that the turbulence seems to have, to a significant degree, gone into remission. The other is that as we thought harder about the experiment that we had implemented in mid-February, we decided that, all things being equal, just an increase in bond spreads alone was a pretty unusual tail experiment, because what that meant was that all the other financial conditions that we key off are held constant, and that one measure of bond volatility widens out. That turns out to be a pretty far tail experiment. What we saw in February didn't look like it answered to that description. It had the bond spreads widening, but it had a deterioration on a number of other dimensions that were already captured in our standard operating procedure. So we decided that the amount of weakening that we had in mid-February probably overdid it.

This is one of those areas in which I think the intuition that there must be something there makes a ton of sense. We've taken a small step toward building that in when the evidence looks strongest, but other dimensions of it may be at work. We haven't seen it show up in measures of consumer sentiment, though. So households, as best as we're able to capture that, aren't reporting that they're unnerved by the financial developments. The hiring picture still looks pretty good. We've looked hard and have thus far been unable to develop very strong evidence that volatility by itself should be having big effects on our baseline.

So I think that puts us mostly in the camp of thinking that what we're talking about is downside risks. I do think the journey that we went through, from the January Tealbook through a somewhat scary period through mid-February and back, took, at least in my mind, a statement about downside risks in our projection that had felt a little antiseptic, a little theoretical, and put some meat on the bones of how it could be that those downside risks could materialize.

CHAIR YELLEN. Further questions? [No response] I suggest we take a 15-minute break. Coffee is ready. And then we will come back and begin our round.

[Coffee break]

CHAIR YELLEN. Okay, let us resume. And President Williams will start us off.

MR. WILLIAMS. Thank you, Madam Chair. Other than energy producers and exporters, my business contacts remain optimistic. That's probably because of a combination of the sunny skies and the rain we are getting, which is ending our four-year drought. They tell me they generally look through gyrations in financial markets. And with labor income on the rise and the windfall from low gas prices starting to accumulate, there is more cushion in household budgets.

So with the economic data overall meeting or beating my expectations back in December, my outlook also remains upbeat and is essentially unchanged since our meeting in December despite the financial market's downs and ups. Specifically, I have not meaningfully altered my outlook or my assessment of the balance of risks to the achievement of our dual mandate since we raised rates at the end of last year. As in December, I expect real GDP to grow 2.2 percent this year, above my estimate of long-run growth of 1.9 percent.

A lot of the fears from heightened financial volatility that were flashing yellow in January have diminished. Of course, there are still risks to growth from global headwinds. It's important to recognize that policymakers overseas have acted forcefully to mitigate those risks, and there are upside risks on the domestic side, as both consumer spending and housing construction still have room to grow faster than expected.

Another upside risk to the outlook for employment, which I have already made reference to, is that the economy replays its performance of last year. So let's think back to 2015. We added over 2.7 million jobs, we had less than 2 percent growth in GDP, and we saw a 0.6 percentage point decline in the unemployment rate. And this all occurred in the face of very weak foreign demand, plummeting commodity prices, and the sharp appreciation of the dollar. Now, the fact that we got roughly 2 percent growth and 2.7 million jobs, points to two things. One was the resilience of the U.S. economy and labor market, and the other was the fact that labor productivity was so very slow last year—following a trend that we have seen over the past four years. And, as my questions to and discussion with David Wilcox highlighted, I think there is a risk that we could see productivity growth this year be quite slow, which would lead to a much lower path for the unemployment rate.

So it does bring me to the key question, I think, for looking at the economy over the next couple of years in terms of our mandate goal of maximum employment, and that's what's going to happen to productivity growth. Now, my own estimate of potential growth is based in large part on a continuation of the modest trend pace of productivity growth that we have seen over the past decade—that's going back to 2004.

These weak productivity numbers have been particularly disconcerting for many on the West Coast. There is a really strong disconnect between doing the economic analysis concerning productivity and then talking to anybody in Silicon Valley, in the Bay Area, because the pace of innovation in the Bay Area does seem very fast. I haven't seen flying cars or jetpacks yet, but self-driving cars and commercial drones are clearly on their way and are getting to market a lot faster than many expected.

The general reaction in Silicon Valley to the national productivity statistics is denial. The reported data must be underestimating significant gains from the information revolution that they are leading, and this led to the famous Hal Varian quip that we don't have a productivity problem, we have a measurement problem.

So to try to reconcile this disconnect between the data and innovation that feels so fast and is changing so rapidly in front of us, John Fernald on my staff and Dave Byrne here at the Board, along with Marshall Reinsdorf, wrote a paper that they presented at the Brookings Institution last Thursday. And they looked at the contribution of free digital services, like Google, Wikipedia, and Facebook, which have clearly been deeply interwoven into the fabric of everyday life. However, consumers don't pay for these services, so they don't show up in the national accounts. Still, the best estimates suggest that even if we were to somehow come up with prices for these services, they're still such a small factor that they wouldn't offset the drop in productivity growth that we have seen in the past decade.

A second area that they examined is the mismeasurement of prices for IT hardware and software. We know that the measurement of prices of IT and communications equipment are misstated, that, in general, the prices are overstated. But in their paper, in a careful analysis, they find there is no evidence that this overstatement of prices has in any way gotten worse as productivity growth has slowed.

In fact, after doing all of their careful calculations, they think that mismeasurement actually boosts productivity growth more during the late '90s and early 2000s, the period of the tech boom, than it does during the past decade. So, when you adjust the data for the best measures we have of the true underlying quality of these investment goods, the slowdown in business-sector labor productivity since 2004 has actually been larger than is reported in the data.

One of the factors that I think we know, but it's important to emphasize, is that domestic production of IT equipment is a much smaller share of the economy than it used to be. So, if you think about the '90s and the tech boom, we were building a lot of computers and IT equipment. Most of the equipment is now being built abroad, so it shows up in export and import prices. It doesn't affect U.S. GDP and productivity the same way it used to. So, again, I think that's an important factor explaining why the '90s and today are different.

Now, the bottom line of their work is that mismeasurement of innovation accounts for very little of the weakness in productivity growth that we have seen for, now, 11 years. So, in common with the finding in Bob Gordon's work, they view the slow growth as actually being real. It's genuine. It's not an issue of mismeasurement. And the days of 2½ to 3 percent real output growth on a sustainable basis are over, at least for now, and my longer-run projection of productivity growth and potential output recognizes this lower benchmark for what our longer-run potential is.

Also, on the basis of the fact that my view of potential output growth is lower than it used to be, and that this is not a reflection of mismeasurement, it also argues the case that r^* is lower. As in the Laubach-Williams model, there is roughly a one-to-one relationship with the neutral real rate and potential output growth. So my current estimate of r^*, the equilibrium real interest rate, is 1¼ percent, the same as it was back in December.

Looking ahead with above-trend GDP growth this year, my projection has the labor market overshooting full employment by a substantial margin. I expect we will see unemployment at about 4½ percent by the end of the year. But with monetary policy normalization occurring over the next few years, we are going to need to see output growth somewhat below potential in 2017 and 2018 in order to bring the unemployment rate slowly back to my 5 percent estimate of the natural rate by late 2018.

The sustained period of labor market overheating will put upward pressure on inflation and offset some of the lingering disinflationary pressures associated with the pass-through of lower import and energy costs into core prices. The news on inflation, in my view, has generally been good. The January jump in the core PCE to 1.7 percent and the trimmed mean to 1.9 shouldn't be dismissed completely as statistical noise. I would also note that the forces weighing on import inflation from commodity prices and the dollar are diminishing. All in all, I continue to expect to see inflation gradually move back to our 2 percent target by the middle of 2018.

And for those who would like additional reading on my views, I am respondent number 4 in the SEP. Thank you.

CHAIR YELLEN. Thank you. President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. There has been an interesting dichotomy between the real economy and financial markets since the beginning of the year. While financial markets have been quite volatile, U.S. real domestic data have continued to be quite solid. My forecast of real GDP growth over this year is a little over 2 percent, not unlike the average growth we have seen over this recovery. I continue to expect a consumption-led economy that is restrained by lackluster business fixed investment and weakness in net exports, which will be held back by the lagged impact of dollar appreciation and weakness among major trading partners. This modest growth will be sufficient to cause continued improvement in labor market conditions and for core PCE to reach 2 percent gradually.

In essence, my forecast is not that different from my previous SEP submission. In terms of inflation, it remains to be seen how evanescent recent readings on core PCE inflation will be. While I view the lower readings on market-based measures of inflation and some survey-based measures as potentially troubling, the recent data on core PCE inflation and some evidence of very gradual increases in wages and salaries now make me somewhat more confident that we will see some pickup in wages and prices.

A study by my staff looking at various measures meant to capture the underlying trend and the 172 detailed components of core PCE finds a modest increase in the trend for inflation in recent data. In addition, we are already near my estimate of full employment, and we are quite likely to exceed my estimate of full employment over the forecast horizon, though not by the amount assumed in the Tealbook.

If I were to look at the forecast, ignoring financial markets, and based purely on inflation, unemployment, and real GDP readings to date, my view of the economy and appropriate monetary policy would be little changed from my December SEP. However, financial markets have been quite volatile. While stock indexes in Asia have been hardest hit, the S&P had declined notably by the middle of February, although U.S. equity prices in general have recovered much of those losses as of the end of last week. Bank stocks have been particularly volatile. Bank stock prices in Europe were exceptionally hard hit, with declines of 30 percent or more between the beginning of December and the middle of February. Particularly notable was the public announcement by a European finance minister that he was not worried about the financial health of a G-SIB. Such a statement is a fairly reliable indicator that we should actually be worried. [Laughter]

Given the relatively modest change in most domestic forecasts of the U.S. economy, it was a surprising deterioration in the readings from stock prices and CDS of some of our largest banks. While less dramatic than equity price movements in European banks, stock prices for some of our largest banks and some of our banks that are most dependent on wholesale funds declined approximately 25 percent from the beginning of December to the middle of February.

While U.S. bank stock prices and CDS prices have improved quite significantly going into this meeting, I have been surprised by the financial sensitivity of these banks during a time when the real economic data have remained relatively benign. It does make me worry that major banks may be more financially fragile than I had assumed despite the improvements that have been made in capital positions.

In summary, data for the real economy remain satisfactory, while the financial data have been worrisome. So far, it appears that the financial data in the United States are in the process of converging to an outlook more similar to the economic picture we have received on the real side of the economy. I remain concerned that financial stresses emanating from abroad could leave a larger imprint on our economy as we go forward, but I am heartened by the continued progress in labor markets and the evidence so far that we are likely to grow somewhat faster than potential. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Fischer.

MR. FISCHER. Thank you, Madam Chair. Since our decision to raise the interest rate three months ago, we've come through a remarkable period. For nearly two weeks, until the turn of the year, we were able to take satisfaction from the smooth execution of the increase in the federal funds rate and to offer well-deserved congratulations to our New York Federal Reserve colleagues on that achievement.

Then came the financial market turmoil through February 11, reflecting, in part, renewed concerns about the Chinese economy, regarding the effects of declines in the price of oil and other commodities, and about whether central banks were running out of ammunition, and the related question of whether negative interest rates could, by reducing banks' profits, be counterproductive. Our January FOMC meeting and the Chair's subsequent congressional testimony took place in the midst of the market and media turmoil with her message being the right mixture of "steady as we go" and "our decisions are data driven." Then, on Thursday, February 11, the tide turned, and we have now virtually returned to where we were in December in terms of the stock market and the continued strength of labor market performance, along with an increase in the price of oil and a probably temporary increase in inflation but with lower interest rates and the memory of an uncomfortable period of volatility.

So where are we now? We have had two good but slightly mixed employment reports since the previous FOMC meeting. The 172,000 addition to employment in January was well above the amount needed to hire new entrants to the labor force, and the 242,000 addition in February was impressive and should have reduced concerns about a possibly slowing labor market that the January figure might have raised, especially at its first reported level of 151,000.

In addition, labor force participation rates have risen. We had some signs of higher wage growth in January, but these reversed in February, and we've also seen an increase in core PCE price inflation, although the rise reflects, in large part, increases in the prices of volatile components and perhaps also difficulties with first-quarter seasonal adjustment.

The price of oil has risen, perhaps easing fears that inflation expectations are becoming unanchored, as a positive correlation between declining oil prices and measures of inflation compensation appears to have contributed to a decrease in those measures and then to an increase in recent weeks. That is to say, some of the signs of inflation that we've been expecting for a long time may have begun to appear, but hesitantly, implying that uncertainty about their persistence has not been significantly reduced. More generally, the volatility of the volatility we have experienced recently has to some extent increased uncertainty about the external environment in which the United States economy will operate in the next few months and possibly years. That increased uncertainty about the global economy also includes upside risks, among them the results of the strong measures taken by the ECB last week, the first reports that the Japanese consumption-tax increase scheduled for April next year may be postponed, and the impact of the expansionary measures recently decided in China.

Most of all, I take from the experience of the past three months the conclusion that the growth of the U.S. economy is resilient, and that conclusion will be further strengthened if it is supported by incoming data over the next few months. Thus, my uncertainty about global growth has increased, while my confidence about the resilience of the U.S. economy has increased.

Let me also take stock of where we stand in relation to attainment of the dual mandate. We are close to the maximum sustainable level of employment in the economy. The unemployment rate is close to most FOMC participants' estimates of the longer-run normal unemployment rate.

The employment situation has improved for all of the major population groups. The participation rate has turned around and is beginning to increase. These are major achievements, but there is more still to be achieved. There are still more people working part time than would like to, and wage growth has yet to show a sustained pickup.

On the inflation front, the core PCE price deflator for the 12 months ending in January of this year was 1.7 percent per annum. The median 2016 increase in the core PCE deflator projected in the SEP is 1.6 percent, compared with 1.4 percent in the staff forecast, while the median SEP forecast of actual PCE inflation in 2016 is 1.2 percent, compared with 1.0 percent in the staff forecast. The medians projected for 2017 with regard to core inflation and PCE inflation are 1.8 percent and 1.9 percent, respectively, with the staff forecast being 1.6 percent for both.

In summary, with respect to employment, we are very close to our target. With respect to inflation, we are reasonably close to our 2 percent target. And, with the benefit of hindsight, it is becoming even clearer that the divergence between actual inflation and 2 percent over most of 2015 and part of 2014 was primarily due to the effects of the decline in the price of oil and to the strengthening of the dollar.

I'd like to add a few considerations that we will need to take into account as we make our policy decisions at this and future FOMC meetings, and I'll raise these considerations in the form of questions. First, central to our future decisions will be estimates, explicit or implicit, of the impact on the exchange rate of changes in the federal funds rate. One safe but unsatisfactory answer is, it all depends on the context in which we make the decision.

Among the key factors we will need to consider—and here, I'm going through material that was presented earlier by Beth Anne—are possible policy changes in foreign countries in response to our decision and their feedback effects on us. Perhaps we can get some estimates using SIGMA or perhaps rules of thumb of what are the key variables of policies at home and abroad that affect the impact abroad and the resulting feedback effects on us.

As our knowledge of these connections increases, we will learn whether we will increasingly be taking decisions that are influenced by the feedback effects on us of the condition of foreign economies and of their likely policy responses to our policy decisions, a situation that, if it develops, could put us in the place of the Bank of England in the 19th century, whose decisions were taken in the interest of the United Kingdom but were often also interpreted as being good for maintenance of the international financial and monetary system.

Now, these interactions among monetary policies of different countries are complicated and could give rise to game theoretic elements in our and other countries' monetary policy decisions. It may well be that the more monetary policy diverges across the major central banks, the more it may be necessary to agree more clearly on rules of good behavior for central banks operating in the international system. This, of course, is related to the implicit or sometimes explicit agreements on policies that lead to changes in the exchange rate.

Well, it's easy to say that it may be necessary to agree on rules, but there will no doubt be enormous difficulties in reaching any agreement on such rules, and it is interesting that yesterday Raghuram Rajan, Governor of the Reserve Bank of India, also asked to have an agreement on rules for how central banks behave, but I think he was thinking about us as the one that needed to have the rule. [Laughter]

Second, we were certainly justified in downplaying the importance of the stock market declines earlier this year, but we are all aware of the fact that changes in market sentiment can have a self-justifying effect on the economy. Thus, at some point, in the event of a serious and apparently persistent financial market decline, we might find ourselves having to act to stabilize the financial markets in order to stabilize the economy. None of us welcomes the charge that monetary policy contains a "Fed put," but, *in extremis*, there may be a need for such a put, if not in the strict sense of the finance term, then at least in regard to the direction of policy. How should we communicate about such actions, or, as used to be said of the lender of last resort, should we leave such actions shrouded in constructive ambiguity?

Third, what lies behind the current correlations between the price of oil and the variety of financial variables? And to what extent, if any, can we rely on the continuation of these correlations? Presumably, if the price of oil reaches high enough levels, the stock market will cease interpreting a further increase in the price of oil as positive for the economy. But the level at which the interpretation will change is far from clear at this point.

Fourth, how important is it quantitatively if longer-term inflation expectations become unanchored from our target inflation rate? That must depend, in part, on the extent to which movements in longer-term expectations affect short-term expectations or are correlated with them in the many aspects of economic behavior in which short-term expected inflation matters: at a minimum, in the asset markets; in the goods markets, including the effects of expected inflation on investment via the real interest rate; and in the labor market. The staff has recently done some work that goes down this road, but further work would be welcome.

Fifth and finally, in view of the uncertainties we face, what should we communicate about the likely path of policy? On this question I believe we need to bear in mind continually the uncertainty that we face today about the circumstances in which we will have to make future policy decisions. On this question, I can offer at least a partial and a local answer, "local" meaning near in time. We should be careful not to say anything that takes either April or June off the table. We do not know what policies will be appropriate at the times of those meetings, and we should keep our options open. And over longer periods, we should make clear our expectations for future policies, but also make absolutely clear the considerable uncertainty that surrounds them. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Brainard.

MS. BRAINARD. Thank you. I am heartened by the U.S. economic data since our previous meeting, which suggest further movement toward our goals. The labor market continued to strengthen last month, with job growth above 240,000, the unemployment rate holding steady at 4.9 percent, and the labor force participation rate rising noticeably. The turnaround in the participation rate since last summer is particularly encouraging, as it suggests the possibility that labor supply may be more responsive to improved conditions than previously thought, and there may be reasons to believe there is some room for the labor market to improve still further. The employment-to-population ratio for prime-age workers remains 1¾ percentage points below pre-crisis levels. Involuntary part-time employment is still elevated, and wage growth has shown little sign of acceleration.

Inflation has also moved closer to our goal recently. The 12-month change in headline PCE inflation moved up to 1.3 percent in January, while core PCE inflation moved up to 1.7 percent. These moves are encouraging and, if sustained, would be highly reassuring. However, the broader context suggests some caution. The staff projects the 12-month change in core prices to move back down to 1½ percent in coming months, and, of course, a reversal would not be hard to imagine, as core inflation has remained stuck in the vicinity of 1¼ to 1½ percent for the past three years.

Moreover, we can't entirely rule out the risk that this lengthy underperformance of inflation may be having some depressing effect on inflation expectations. Although longer-term inflation expectations of professional forecasters and market participants have remained steady, household expectations have moved lower. In February, 5-to-10-year-ahead inflation expectations in the Michigan survey were 2.5 percent, ½ percentage point below the series longer-run average. Three-year inflation expectations in the Federal Reserve Bank of New York's consumer expectations survey have also moved lower in recent quarters, reaching 2.6 percent last month, nearly ¾ percentage point below the level two years ago.

More notably, both the TIPS- and swaps-based measures of inflation compensation are down about 1 percentage point from mid-2014 and remain at very low levels, with the five-year, five-year-forward TIPS-based measures at around 1½ percent. These indications that inflation expectations may be edging down are concerning and, together with the persistent underperformance of inflation, imply that risks remain weighted to the downside.

With regard to economic activity, the recent data point to continued moderate growth on balance. The pace of consumer spending looks to have slowed a bit recently, but solid job and income growth, together with elevated readings on sentiment and the boost to household purchasing power from low energy prices, should support consumption growth. And the housing sector has also contributed steadily to growth over the past year and should continue to do so.

In contrast, sectors of the economy exposed to the strength of the dollar or the fall in energy prices have struggled. Net exports subtracted about a ½ percentage point from GDP growth in each of the past two years, and staff models suggest that net exports will be a source of another sizable subtraction this year.

The extreme financial difficulties faced by some firms in the energy sector have spilled over into financial markets, in which we saw a pronounced widening of corporate bond spreads. Since the middle of last year, triple-B spreads have increased about 75 basis points, while higher-yield bond spreads have increased substantially more despite the recent improvement.

Bond spreads are a potentially important gauge of financial frictions. They play a powerful role in some DSGE models that explicitly incorporate a financial sector—such as the New York Federal Reserve's DSGE model—and, of course, spreads have proven to be one of the more accurate harbingers of recessions.

Although much of the recent increase is concentrated in energy, which likely weakens the signal for the overall economy, spreads have also increased notably outside the energy sector on net. More broadly, the substantial financial volatility and tightening that we saw from early January through late February was quite sobering.

On net, since that time, financial conditions have eased somewhat and now look less adverse for the U.S. outlook. It's possible these reflect improvements in some underlying drivers. In particular, some have seen recent movements in oil prices as a possible inflection point underpinned by a rumored agreement among some of the major producers.

By contrast, the broader foreign environment remains highly uncertain. What has fundamentally changed on China? The answer is, "Not much." Recent news doesn't materially change the risks concerning China's path forward. Policymakers have signaled a commitment to some more fiscal stimulus this year, but China's data on trade, retail sales, and PMIs have been relatively downbeat. Central bank communication has soothed markets, and the exchange rate has been relatively stable against the designated basket of currencies since Golden Week, but so, too, has the dollar. And the institutional framework and lack of transparency on monetary policy communications, decisionmaking, and even the basic objective function have not changed. Similarly, tough policy tradeoffs remain unchanged. Policymakers confront a sharp slowing in the goods sector, a large buildup in corporate debt, and an apparent surge in demand for foreign assets. A further slowing in growth, continued increases in leverage, and capital outflow pressures, along with a further weakening in the RMB, are all still possible outcomes.

More broadly, sources of economic strength across the globe are few, and sources of weakness relatively greater. Since mid-2014, the IMF has repeatedly revised down its projections of 2015 growth, with these downward revisions now accumulating to 1 percentage point, and incoming data have similarly led the Board's staff to mark down further its projection of foreign growth this year.

Commodity producers and countries with strong trade ties to China face difficult adjustments. Growth in advanced economies remains extremely weak despite recent moves to reinforce extraordinary monetary accommodation. In Japan, activity contracted last quarter, and growth for the year as a whole was only ¾ percent. In the euro area, growth was only 1¼ percent last quarter, and the mixed financial market reaction to recent announcements of further accommodation by the BOJ, ECB, and Riksbank has contributed to questions about whether foreign policymakers might confront limits, or at least tradeoffs, in their policy responses upon reaching a policy-rate lower bound, if additional unexpected adverse developments were to arise.

Weak global growth and low global inflation magnify both the risks and consequences of adverse shocks, and it's not clear whether policymakers across the globe will be able to deploy all of the necessary tools in order to address these risks adequately. As we've seen, this can lead to strong dollar appreciation and increased concern about downside risks to growth globally in financial markets, spilling across our borders.

As I said earlier, recent weeks have seen an easing in financial conditions, supporting a recovery in equity markets and relieving pressure on the dollar, which is now 2 percent below its trade-weighted value earlier in the winter. One thing that has changed is the market's expectations surrounding the FOMC's path. Changes in the expectations surrounding the policy rate path coincide with material reductions in important long-term interest rates, such as mortgage rates and rates for higher-grade corporate bonds. Since the time corporate bond spreads started to rise, OIS quotes suggest that expectations regarding the federal funds rate at the end of this year and the end of 2017 are down close to 35 basis points and 75 basis points, respectively. Current OIS quotes are consistent with one further rate increase this year, while the median of primary dealer and market participants' modal forecasts is of two rate increases. It's thus quite likely that if we were to signal a materially steeper path, we would see a broader financial tightening in anticipation, perhaps reversing all or some of the important easing in financial conditions we have seen in recent weeks. It's thus important that we take into account this endogeneity of financial conditions and their implications for the U.S. outlook as we choose our words and actions in response to the evolution of the economy, a topic to which we return tomorrow. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Bullard.

MR. BULLARD. Thank you, Madam Chair. Information received since the previous FOMC meeting indicates that business conditions in the Eighth District have been mixed. Business contacts report strengthening wage pressures and modest employment growth. However, reports also suggest that first quarter sales were generally unchanged compared with one year ago.

The outlook for local economic conditions deteriorated relative to our December 2015 survey of contacts. Respondents who marked down their outlook generally emphasized the negative impact of relatively low agricultural and energy prices. An uptick in commercial construction activity was the most cited reason for a positive outlook.

District housing market conditions continue to improve. Real estate contacts noted that 2016 has started off well, and they are expecting strong growth. Data on sales, building permits, and prices are consistent with contacts' assessment of the housing market.

I have a few remarks on the national outlook. From the St. Louis perspective, real GDP growth was disappointing in the second half of 2015 and does not look like it will be particularly robust in the first half of 2016. I appreciated President Williams's comments on potential growth earlier. Accordingly, we at the Federal Reserve Bank of St. Louis have marked down our real GDP forecast for 2016 into the 2.0 to 2.5 percent range. This marks the end of a sequence of St. Louis forecasts obtained from our empirical model, which called for at least a several-quarter period of real GDP growth markedly above trend. This lower growth outlook in turn suggests that policy recommendations may be somewhat less aggressive than previously called for in our SEP.

On labor markets, inflation, and the global outlook, however, recent data have been consistent with our previous projections. On the basis of these data alone, I think there is a strong case to be made that the Committee is today more or less where it expected to be last December, and, therefore, that the Committee should be more strongly considering a follow-up increase in the policy rate than we apparently are.

This is an important matter for the Committee, as it reflects on the time consistency of monetary policy. If we did not think we would move in a certain state of the world, arguably we should not have said so via the December SEP. One way to think about this would be that the SEP does not contain all of the variables that are important to the Committee decision.

During the past several months, I have become more concerned about the state of longer-run inflation expectations in the United States. In particular, five-year, five-year-forward market-based inflation expectations fell at one point to a post-crisis low, although they have since recovered to still-low December levels. I am not anxious to push a policy of rate normalization with this type of volatility in an important measure of the credibility of the Committee's resolve to achieve an inflation target of 2 percent.

I have several remarks on this issue. First of all, I appreciated the staff memo on this topic. I thought it was nicely done and a good summary of the issues.

Second, I think I want to comment a little bit on the high correlation between oil price movements and market-based inflation expectations. During 2015, at this table, I argued that we needed to wait for oil prices to stabilize before we could assess the meaning of the inflation expectations measures. However, last November oil prices resumed falling and have been volatile since then. Market-based inflation expectations fell further. In my view, they fell too far for comfort, regardless of whether the oil correlation makes sense or not. And the price of oil correlated with the five-year, five-year-forward inflation rate makes no sense. But whether it's there or not, these inflation expectations measures have simply fallen too far as of, say, mid-February. Generally speaking, across the maturity spectrum, inflation compensation has declined 100 basis points from July 2014. I would regard July 2014 as a satisfactory level for inflation expectations in the United States, so the recent lows were well off that level.

Third, I regard these market-based compensation numbers as good indicators of inflation expectations. In a model, on account of the credibility of the monetary authority, these measures should not change much, especially the five-year, five-year-forward rate. In the real world, the central bank does not have perfect credibility. The TIPS measures could be interpreted as a day-by-day measure of FOMC credibility. During the intermeeting period, the five-year, five-year-forward rate fell below 1.5 percent, a value that I would consider the outer bound of where I'd like to see that number go.

There is a literature, often cited here, based in part on affine term structure models, that attempts to decompose inflation compensation into inflation expectations, a risk premium, and a liquidity premium. I do not find these decompositions very convincing, because there are a lot of ways in which to accomplish the decomposition, with quite different implications for the volatility of the various components. Instead, I'd prefer to interpret risk premiums and liquidity premiums as relatively stable and the overall inflation compensation as a rough barometer of inflation expectations and, hence, of FOMC credibility.

Fourth, I would add that I do not find survey measures very useful because they do not respond very much to incoming data and therefore don't help us much via signaling.

Finally, market-based inflation expectations have rebounded in recent weeks, but I remain concerned that they fell as far as they did during the intermeeting period, and I would like reassurance that they have stabilized during the coming months. In short, I think we ignore market-based inflation expectations at our peril, and we should not downplay movements as much as we typically do. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Harker.

MR. HARKER. Thank you, Madam Chair. Economic activity in the Third District continues to improve, and there are even signs that manufacturing has bottomed out and may be growing once again, albeit slowly. Employment growth is strong, consumer spending remains healthy, and commercial construction continues to grow modestly. Unlike the nation, however, residential construction has weakened, and house price appreciation is a good bit more restrained.

After six straight months in negative territory, our Manufacturing Business Outlook Survey bounced back strongly in March. The general activity index now stands at 12.4, which is slightly above its nonrecessionary average of 9.9. Strength was seen both in new orders and especially shipments. Further, inventories continued to be drawn down, but there's no evidence of any significant improvement in job growth. There's also no evidence of any price pressures, either for prices paid or prices received. Area manufacturers are also significantly more upbeat than they were in February, with the diffusion index for future activity jumping 11 points, to

28.8. As well, all future subindexes reflected a rebound in optimism. As this is only one report and we don't want to be data point dependent, I would not wish to get overly carried away by it. But it does appear that manufacturing in the Third District may have bottomed out and may even be showing signs of slow growth.

Nonmanufacturing activity in the District continues to grow modestly, as reflected by our NBOS headline activity index of 25.6 in February. The index is now only slightly below its nonrecessionary average of 29.7. There is also some evidence of inflationary pressures building in this sector, as the prices-received index increased to 22.4 and continues to remain above the level that is typical in an expansion. Expectations of future activity also rose modestly in February and remain solidly in positive territory.

Our Beige Book contacts report a slight weakening in some sectors in the region, with homebuilding and loan activity declining slightly. Unlike the nation, housing permits actually declined in January. For the three states in the District, house prices continue to rise but at a less rapid pace than for the nation. On the positive side, auto sales remain brisk and commercial construction continues to be a source of strength.

The Philadelphia staff also constructs coincident indexes for all 50 states. The indexes are based on statewide employment growth, unemployment, hours worked in manufacturing, and wage growth. Looking at each state index, we now see seven states that are experiencing negative growth, most of them with significant reliance on the energy sector. That is a higher number of states than we have seen in the recent past, so we analyzed whether this represented a harbinger of a significant downturn in economic activity. We did this by creating a diffusion index using the percentage of states that were growing more than 0.1 percentage point minus the percentage of states contracting more than 0.1 percentage point—and that was computed as a three-month rate. That index stands at 82, which is a very healthy number. Although we have not done any formal statistical work, it appears that one generally needs at least two consecutive quarters for which the index is below 50 before a recession would occur.

For the nation as a whole, the economy looks to be in better shape than it did in our previous meeting. Labor markets remain robust. Consumption appears to be picking up. And, as in my District, manufacturing may well have bottomed out. Further, recent data on inflation, coupled with the findings contained in the excellent Board staff memo on longer-term inflation expectations, lead me to be more sure that inflation expectations continue to be well anchored and that inflation will return to target, although we have the concerns that President Bullard and others have expressed.

My current forecast of the economy is informed by work by Shigeru Fujita on our staff on the effect that the increasing rate of retirement will have on the behavior of labor force participation. He finds that over the next three years, the labor force participation rate is likely to fall 1.2 percentage points because of the increase in the retirement rate resulting from the continued aging of our workforce. The retirement rate continues to decline after 2018, and it is projected to decline 4 percentage points over the next 10 years. His estimates of labor force participation are in line with the estimates made by Aaronson and others here at the Board.

Incorporating the effects of falling participation rates leads me to slightly downgrade my view on employment growth and hence output growth from my previous forecast. The fall in the growth rate of the labor force may place a bit more upward pressure on wage growth, and that could lead to inflation. I regard this as placing more upside risk on my inflation projection, but I haven’t as yet marked up my inflation projection.

To summarize, I still believe that we will see economic activity rebound to about 2 percent this quarter, then grow a bit above trend for the rest of the year. Growth will then gradually slow to a trend-like rate by 2018. This is the same contour as my previous projection, but it takes into account a slightly lower trend growth rate. Thus, I anticipate growth of around 2.3 percent this year and next, falling to 2.1 percent in 2018. I now anticipate that the unemployment rate will drop to 4.7 percent by the end of the year and 4.4 percent by the end of 2017 and remain there in 2018. In light of first-quarter weakness in headline PCE inflation, I forecast that inflation will be 1.2 percent this year and move up to 1.9 percent in 2017 and 2 percent in 2018. I also see gradual firming in core PCE inflation and project that core PCE inflation will be 1.6 percent this year and rise to 1.8 percent in 2017 and 2 percent in 2018. Thus, my forecast is pretty much in line with that as presented in this month's Tealbook. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Madam Chair. I will start, as always, with energy. There will be a time in the future when we won't start with energy. Since the previous FOMC meeting, as Beth Anne mentioned, there was an announcement of discussions of a production freeze between OPEC members and Russia. Our own view is, the actual supply–demand impact of this agreement is questionable, particularly as the parties involved are all operating basically at capacity. And the one party that is relevant, Iran, has explicitly said they will not participate in this agreement and they won't freeze their supply until they reach the presanction production level, which is approximately 3 million barrels a day.

In the previous meeting, I said we thought that during 2016, excess supply would average about a million barrels a day. I said we thought we'd end 2016 with an excess supply of about

500,000 barrels per day, and we thought we'd reach some level of daily supply–demand balance probably by mid-2017. And although there's disagreement, I must say that the data we've seen since the previous meeting are to the downside on all of these measures, and I'll come back to that. We think if we're wrong about being in balance, it will take longer. Here's why.

The International Energy Agency has been very public in saying they are much more optimistic than we are about this forecast. They think we'll end 2016 close to balance, but they're counting on very significant supply reductions in the United States. The issue is, the shale industry in the United States is about 4 million barrels. This is relative to world production and petroleum/petroleum equivalents of about 96 million barrels. And what we've seen so far is, despite substantial cap-ex cuts and draconian cuts further in 2016, supply reductions have been slow to materialize. And when they have materialized, they've been dwarfed by increases of supply outside the United States by Russia, in the Gulf of Mexico, and by Iran. So we're skeptical that we can see enough supply cuts in the last half of this year to help offset what is going on in the rest of the world. And, in fact, our own estimate is that, for all the pain and suffering we've been through, we think global supply will actually increase slightly from 2015 to 2016 and then will flatten from 2016 to 2017.

So why are people, including us, calling for balance? One of the things that we are relying on is, we still expect global demand to grow almost 1.2 million barrels a day in 2016. So even if global supply simply flattens, because of ongoing demand growth, we will eventually get into balance. Here are a couple of other reasons why the price may have firmed recently. We think people in the market probably have an unrealistic expectation that there will be additional OPEC action. We think this is unlikely because the economic incentive of the individual players is to keep pumping. We think there's been some amount of short covering—the financial players have been short this commodity, and they're needing to cover their shorts. The other very significant event that has happened that is very real is, there have been about 2 million barrels of unplanned outages because of pipeline bombings in Nigeria and Iraq. There's some uncertainty as to when those 2 million barrels will come back in the market, as we're waiting for repairs to be made, and we think that has had an effect on firming the price.

Our working range on the price of oil is somewhere between $25 and $45 a barrel. We're right in the middle of that range right now. It would not surprise us to revisit the lower end of that range. We hope we don't, but we think that is a real possibility. Time will tell. And in the meantime, we really do expect we're going to see more price volatility; potentially, downside risks; and bankruptcies, mergers, and restructurings. But a lot of the question is going to be, in light of the draconian cuts that are being made in the United States, how far can those supply cuts go and can they offset what's going on in the rest of the world? And we are still skeptical about that.

Not surprisingly, because of energy and the strong dollar, there are clear headwinds in the Eleventh District. Manufacturing remains weak, and in fact is now in negative growth territory. The services sector is slowing but still growing. Houston is obviously suffering. But Dallas, San Antonio, and Austin are still growing because they're diversified and because there's a continued migration of people and firms to Texas. Housing remains strong except in Houston. And we're now down to the point at which the energy industry in Texas is 2 percent of employment and 10 percent of GDP, and that was 14 percent just two years ago. So this industry obviously is shrinking in its importance. We still expect some positive job growth in 2016 in Texas, but risks are clearly to the downside.

For the nation, our own GDP forecast is very similar to the 2015 outcome. We expect 1.9 percent growth in 2016. We do expect the unemployment rate to continue to decline from 4.9 percent to 4.6 percent during the year even as the participation rate slowly ticks up. We believe slack in the labor market will decline this year. A number of you have mentioned the Dallas trimmed mean. It had been running at 1.6 to 1.7 percent from early 2014 to the end of 2015. It did tick up in January, as President Williams mentioned, to 1.9 percent. We don't know that that will be sustainable, but we will be watching the stability and trend of this measure. We do expect the consumer to remain strong this year because of lower gas prices, a strong dollar, and a strong jobs market.

A couple of comments on non-U.S. events. Much has been discussed already about declining estimates for rates of growth outside the United States, and we view the risks for global growth as to the downside. We are particularly focused on high levels of debt to GDP in developed economies and aging demographics, as President Harker mentioned, not only in the United States, but in most developed economies. We're focused on China, whose growth, as has been said, is slowing. In particular, the structural challenges of overcapacity, high levels of debt to GDP, and transition to an economy that is based on consumer services threaten spillovers to emerging markets in other countries. But we're more concerned, and I'm more concerned, about the financial transmission of potential devaluation, stock market turmoil, and capital flight from China. I'm more worried about that than the underlying economic conditions.

And on that point, we've talked about this before: The S&P 500 derives as much as 50 percent of its profits from outside the United States. We carefully track S&P estimates. They have been steadily and gradually revised down since January 1, and that continues. Part of it is energy, part of it is weakness in financials, but part of it is also the strong dollar and weak non-

U.S. growth. Because of that, we believe we will continue to be vulnerable to periodic bouts of financial market tightening, particularly because, on balance, market participants are overallocated to risk assets. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Evans.

MR. EVANS. Thank you, Madam Chair. The reports on economic activity from my business contacts were similar to January. Manufacturers with international exposure or businesses with a presence in the energy or agriculture sectors continue to struggle. But I heard positive commentary about the U.S. consumer and a few somewhat better reports on construction. For example, my director from Discover Financial Services noted that the gyrations in financial markets and other unsettling news did not have much of an effect on retail sales. On a year-over-year basis, his nominal credit card receipts excluding gasoline have been growing at about a 5 percent rate for several months in a row. My new director from Illinois Tool Works, a large and widely diversified manufacturing conglomerate, reported continued strong demand from the automotive sector. He also said that demand for products used in residential and commercial construction had begun to increase after being flat last year. But on the downside, their product lines related to capital expenditures continued to be soft. Others reported similar news.

With regard to to the economic outlook, the data on spending, when compared with our December SEP, have been broadly in line with our earlier expectation that the labor market has improved somewhat faster, but financial conditions are more restrictive. Balancing these factors, we left our forecast of real GDP growth in 2016 unchanged at 2.1 percent. If you're keeping score, I'm number one in the SEP packet. We're also looking for growth in 2017 and 2018 to average near this 2¼ percent pace. However, our assumptions about potential output growth are somewhat stronger than those in the Tealbook, and we currently see a little more slack in labor markets. Accordingly, our projection does not overshoot potential output as much as the Tealbook forecast.

President Williams may be happy to hear that there is some upside potential to our outlook. A solid labor market and continued low energy prices could lead to stronger household spending than we are expecting, with attendant spillovers to other components of domestic demand. However, we do not see these possibilities as being as likely or as powerful as the downside risks that financial shocks could weigh more heavily on credit conditions, household and business sentiment, and domestic spending than we have assumed. Accordingly, although I think we've written down a reasonable modal forecast, we see the balance of risks to the GDP projection as tilted to the downside.

I want to spend some time now on credit conditions and market sentiment. Two economists on my staff, Marco Bassetto and Luca Benzoni, ran an interesting empirical exercise to calibrate the effects of an increase in risk spreads in terms of an equivalent tightening in monetary policy. For example, how many rate increases is a 50 basis point increase in spreads actually worth? They added a financial conditions indicator to a standard macroeconomic-data vector autoregression (VAR) system that I've used in work with Larry Christiano and Marty Eichenbaum. The VAR analysis measures shocks in these financial indicators and also policy shocks in the federal funds rate.

The analysis compared the effects of each shock on macroeconomic variables to gauge their relative effects. The most interesting results use the excess corporate bond spread index developed by Simon Gilchrist and Egon Zakrajšek. The GZ spread was featured in the Tealbook box and FOMC memos on recession probabilities. From last summer to the end of February, the

GZ spread widened considerably. Marco and Luca use an ARIMA analysis to isolate the unexpected component of this spread widening. This leads them to estimate that the effects on GDP from such an exogenous GZ spread widening would be roughly equivalent to a 75 basis point tightening of the federal funds rate. That's three rate increases.

PARTICIPANT. Or one very big one. [Laughter]

MR. EVANS. Always happy to leave something for the table commentary, I guess. Furthermore, a GZ shock of this magnitude would typically induce an additional endogenous reaction of FOMC policy to limit the damaging effect on GDP growth, and this is an example of influences that Governor Brainard was discussing. In the VAR, this response dictates that the federal funds rate falls about 75 basis points over a year. In the analysis, if the 75 basis point easing was not taken, that would be another exogenous federal funds tightening of that magnitude. In my notes, I mention how many rate increases that is, but I don't think that's necessary now. [Laughter]

Presumably, the reduction in the SEP median path and the market's lower assessment of this path are responses to events like these tighter financial conditions. I can't stress too strongly that these findings are quite preliminary, and much uncertainty surrounds them. But they strongly suggest that the recent financial spread widening is worth multiple federal funds rate increases.

In addition to past financial tightening, a number of our financial market contacts have expressed the view that we could be in store for recurrent risk-off episodes that lead to a downward skew in financial conditions. They see these episodes emanating from ongoing concerns over structural issues in emerging markets and their impact on the global economy. In addition, there are the difficulties around the world in policymakers' ability to address these challenges at the effective lower bound. I share these concerns. Others have mentioned them, too. And these downside risks could, on account of their sources, be with us for some time to come.

Let me finish with our outlook for inflation. The higher incoming data caused us to raise our forecast of core inflation one-tenth this year to 1.6 percent. We then have inflation slowly rising to near target by the end of the forecast period. We see the slightly improved higher outlook for inflation as a good modal forecast, albeit one with the risks tilted to the downside. Although a number of our statistical models expect a good deal of persistence from the recent higher readings on core inflation, we recognize a strong case can be made for the Tealbook's view that the bump-up in some of the PCE price index components will prove to be transitory.

In addition, the persistently low readings on inflation breakevens and downward drift in some surveys suggest that longer-run inflation expectations may have already slipped below our inflation target. At a minimum, they point to a worrisome fragility in inflation expectations and uncertainty about our nominal anchor. Any meaningful reduction in expectations would make it all that more difficult to reach our 2 percent target. This is the biggest downside risk of all to our inflation forecast, in my opinion. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Mester.

MS. MESTER. Thank you. Leading into our January meeting, business sentiment had fallen in the Fourth District. But over this intermeeting period, sentiment has improved decidedly. Overall activity in the District remains consistent with continued moderate economic growth. The Bank's diffusion index of business contacts reporting better versus worse conditions increased 30 points, from minus 16 in January to plus 14 in February. This is the best reading we've seen in over six months. Bankers in the Fourth District reported overall credit demand has increased slightly, with commercial lending mainly financing acquisitions or commercial real estate projects.

One real estate developer reported that banks are becoming aggressive in lending for commercial development, offering longer-term financing and interest rates approaching historical lows. He expressed concern about the ability of some developers to roll over maturing credit obtained during the crisis, because of the high leverage in some of these deals and the decline in appraised value since the bubble burst. The improved sentiment in the District is consistent with the solid and ongoing improvement we've seen in labor markets. The Cleveland staff estimates that District employment grew 1.3 percent over the year ended in January. The District's unemployment rate was 4.9 percent in January, well below the minimum of 5.2 percent reached during the last expansion. The staff's diffusion index of hiring activity increased from minus 1 in January to plus 10 in February.

Now, a broader set of contacts are reporting ongoing signs of labor market tightening, with firms across the service sector saying it's difficult to find and retain workers. Retailers and bankers are now experiencing rising wage pressures for lower-skilled workers. One Branch director, whose firm assists in placing unemployed workers, indicated that her pool of potential workers has shrunk to those whose skill sets leave them difficult to place. The relocation of workers in the energy sector has been slow. Much of the District's employment in the mining, oil, and gas sector is in Appalachia and eastern Ohio, and those areas do not have diversified economies. It seems likely that these displaced workers will need to relocate to other areas to regain employment.

When we've been through a period of very high unemployment, as we have during the recession, sometimes it's easy to forget the types of inefficiencies that occur if the unemployment rate moves too far below a sustainable rate. The kind of unintended consequences of an overly tight labor market is conveyed by a report from one of our directors who's a community banker. Since the start of the year, he's been visiting many of his clients across the region. Mayors in several towns indicated that labor market tightness has become a big enough issue that they've had to pull back on efforts to attract new firms to their towns, which would be valuable to the community over the longer run, because of pushback from incumbent firms who would prefer not to have to face increasing competition for the small pool of available workers.

With regard to the national economy, early indicators suggest the step-down in growth in the fourth quarter of last year and the tightening in financial conditions earlier this year have begun to reverse. Growth indicators suggest a pickup from the 1 percent seen in the fourth quarter. The Cleveland Federal Reserve staff has two nowcasting models that are reported in the Tealbook, and those have been reestimated including the data that have come in over the past week since the Tealbook closed, including today's retail sales report and PPI data. Basically, the nowcasts are now about 0.1 percentage point lower than the estimates reported in the Tealbook for Q1 growth.

Financial condition indexes, which had shown significantly tighter conditions in January, eased in February and March, reflecting the increase in stock prices, narrowing of credit spreads, and depreciation of the dollar in recent weeks. On balance, financial conditions are only a bit tighter than anticipated. These relatively fast moves in financial markets point out some of the challenges in assessing the impact of financial conditions on the medium-run outlook.

On the basis of available data and anecdotal reports from business contacts, in my view, the underlying fundamentals of the U.S. economy remain sound. I've made some changes to my projections since the December SEP submission, mainly regarding my longer-run projections. In particular, I've moved down my estimates of longer-run growth, the longer-run unemployment rate, and the longer-run federal funds rate by 25 basis points each. My longer-run growth and unemployment rate estimates had been on the high side of the FOMC projections. But because of the combination of continued improvement in labor markets, moderate growth, and low inflation, it seemed like it was time for me to move toward the consensus on these measures. I now project longer-run growth at 2 percent, the longer-run unemployment rate at 5 percent, and the longer-run funds rate at 3¼ percent.

In response to incoming data, I've made relatively minor adjustments to my projections over the next three years, and the narrative underlying the forecast remains the same: Namely, growth slightly above trend will generate further improvement in the labor market, and inflation will gradually return to our target of 2 percent over the forecast horizon. My modal forecast has growth picking up to the 2¼ to 2½ percent range this year and next and gradually returning to trend in 2018.

Despite the volatility in financial markets, consumer spending has held up, buoyed by gains in the labor market, low energy prices, and highly accommodative monetary policy. Housing has also shown slow but steady improvement. The gains in consumption and housing will help offset continued weakness in manufacturing in sectors exposed to energy and international trade, which I anticipate will remain challenged in the wake of weak growth abroad. Business investment is something that bears watching, and although it's just one month of data, January's improvement in capital goods orders is a positive sign.

Labor markets are showing continued strong performance. I believe the economy is basically at our goal of full employment from the perspective of monetary policy. With growth above trend, I see the unemployment rate falling below my longer-run rate of 5 percent this year and next before gradually returning to that level by the end of 2018. Since its low point last September, the labor force participation rate has risen ½ percentage point. It's slightly above its longer-run trend, as estimated by the model developed by the Cleveland Federal Reserve and Board staff. Certain measures of underemployment, like the number of part-time workers who would rather work full time, remain at higher levels than before the recession. At the same time, businesses tell us they cannot find workers with the skills they need. I do believe there are longer-run problems, including workforce development issues, affecting U.S. labor markets, and that deep recession and slow recovery have exposed and exacerbated these problems. But it's difficult for me to see how monetary policy can be effective in addressing these remaining issues. And at this point in the cycle, using it to try to do so can be counterproductive because it takes the focus off government programs and policies that would be effective.

The recent data on inflation have been encouraging and consistent with the pattern that has been anticipated by the FOMC. As oil prices and the value of the dollar have shown some stability, both headline and measures of underlying inflation have moved higher. And these moves are not just one month's data. Headline and core measures of CPI and PCE inflation have been moving up over the past year. As one well-respected economist and monetary policymaker, who happens to go by the name of Stan Fischer, carefully articulated in a speech last Monday, "We may well at present be seeing the first stirrings of an increase in the inflation rate."

Stable inflation expectations are an important component of inflation dynamics. Despite some small movements, I view inflation expectations as reasonably well anchored. Long-run PCE inflation expectations in the SPF moved up this quarter back to 2 percent. Moves in the Michigan survey's long-run CPI inflation expectations measure are correlated with changes in oil prices. And according to the Board staff memo, much of the decline in this measure since the second half of 2014 can be accounted for by the drop in gasoline prices. The sharper fall in the New York Fed's Survey of Consumer Expectations is difficult to interpret because this survey is new and its measures expected inflation three years ahead, which may be more heavily influenced by recent inflation movements.

Many of the market-based measures of inflation compensation have fallen by more than the survey measures. An exception is the Federal Reserve Bank of Cleveland's five-year, five-year-forward measure, which is based on a model that incorporates survey measures of inflation expectations as well as market data on nominal Treasury yields and inflation swaps. The Cleveland Federal Reserve measure has been relatively stable at near 2 percent. Like the survey measures, changes in market-based inflation compensation have shown high correlation with changes in oil prices. And in this period of heightened market volatility and flight-to-quality flows into U.S. Treasury securities, I think it's particularly difficult to discern how much of the moves reflect changes in inflation expectations and how much reflect changes in risk premiums or liquidity premiums. So although I agree that it's very important to continue to monitor all of these measures, so far I don't see them as alarming, and the movement up in actual inflation is somewhat reassuring.

Hence, if the real side of the economy continues to perform consistent with my projections, I'm reasonably confident that inflation will gradually move back to our goal of 2 percent, likely by the end of 2017. I see the risks associated with that forecast as roughly balanced, with lower oil prices being a downside risk in the near term but an upside risk in the medium run because they may spur stronger-than-expected consumer and business spending in an environment of significantly accommodative monetary policy. I note that in the chart on page 27 of Tealbook A, which shows the 70 percent confidence interval associated with the staff's inflation projection based on historical staff forecast errors, the risks are tilted to the upside, not to the downside, throughout the forecast horizon and particularly so for 2016.

Of course, my projections are dependent on appropriate monetary policy, which I continue to believe entails moving the funds rate up gradually over the forecast horizon. Because I have moved down my longer-run funds rate projection 25 basis points, my funds rate path is now shallower across the forecast horizon than in my December projections. I acknowledge there continue to be risks to the forecast, but I see them as roughly balanced and not much larger than what we've seen historically. Of course, I also accept the fact that economic forecasts generally have fairly wide confidence bands around them, but I'm not ready to call them "lack of confidence" bands.

The volatility in financial markets is a risk to my forecast. If it were sustained and intensified, it could lead to a sustained pullback in risk appetites among investors, businesses, and consumers. But so far we haven't seen this, and messages from the market can turn around quickly. A related risk comes from developments in the global economy. If it turns out to be weaker than anticipated, this could lead to weaker growth in the United States. The actions taken by several foreign central banks to increase monetary accommodation help to mitigate some of this risk.

It's good to remember that despite the volatility, despite the pain inflicted on the energy sector from falling oil prices, and despite weaker growth abroad, the U.S. economy has proven to be quite resilient. I think this should be the message coming out of our meeting tomorrow. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Lockhart.

MR. LOCKHART. Thank you, Madam Chair. I haven't materially changed my outlook from my December submission. I'm still expecting growth between 2 and 2½ percent for the year, and my submission for this meeting is at the high end of that range. Although inflation could soften a little over the next few monthly reports, I still expect both headline and core inflation will be firmer in 2016 than 2015, and I expect further strengthening in 2017.

I asked my staff to do a side-by-side comparison of a list of data elements to identify where, if at all, important indicators were diverging from the basic economic narrative that informed my December submission. The one element that stands out as weaker is business fixed investment. Otherwise, real economy performance seems to be consistent with my outlook going into the December meeting. My view at that time was that ongoing solid growth of domestic demand would likely override headwinds resulting from the uncertain global environment.

Because the key driver of real-side performance continues to be domestic demand underpinned by growth of consumer activity, today's retail sales report was disappointing. However, even with the February report and the downward January revision, consumer spending remains at a relatively solid 2.7 percent annual growth rate in my Bank's current-quarter nowcast calculation. My Bank's nowcast exercise for the first quarter currently has growth coming in at 1.9 percent as of this morning. As the February data come in over the next several days, the estimate could move, but my sense of the picture reflected in the data since December is, the economy remains on plan, so to speak, with some downside risk.

In my team's outreach to business contacts this cycle, we heard confirming anecdotal reports—or, put differently, we did not hear reports that cast substantial doubt on our basic narrative. Our contacts report that activity remains reasonably strong, with the exception of sectors connected to offshore demand and energy production. Retail industry contacts reported solid consumer activity, with expectations of modest acceleration in retail spending in 2016. Auto sales remain strong, although considerable price discounting and incentives are being used to maintain high sales levels. As regards the labor market, we continue to hear reports that conditions are tightening even as underlying pressure on compensation growth remains light.

So, to summarize the rebound in our tracking estimate for this quarter versus the fourth quarter, we see, on net, positive signals on consumer spending, strength of the labor market, and strong reports from the business community. All of this generally affirms the view that the fourth-quarter slowing was an aberration—more aberration than signal—and the economy in 2016 remains on a moderate growth track.

All that said, to present a complete picture, we did note a slightly more guarded tone in the feedback received from business contacts. Conversations with our directors reflecting their own recent contacts point to an environment of somewhat heightened uncertainty. They attribute this apprehensiveness to the recent financial market volatility. In a survey of business contacts completed last week by my Bank, about 20 percent of our panel of CEOs, CFOs, and business owners indicated they have scaled back their cap-ex or employment plans in response to the recent financial volatility. We don't have good methods of benchmarking this response, so we're just taking note that one in five respondents appears to have postponed, but not canceled, expansion spending. This may explain the weaker business fixed investment data.

My bottom line from all of this is that the spell of volatility experienced in January and early February should be processed in our policy thinking in a way similar to that of last August and its aftermath. It's a bout of nervousness that has raised uncertainty but apparently has not thrown the real-side economy off track. Just as the October meeting last year was too soon to be comfortable with that conclusion, this meeting may be a little too early to draw such a sanguine conclusion. The data calendar has not lined up propitiously with the timing of this meeting, but by the April meeting we will have more information—although, to be fair, not the first-quarter GDP report, unfortunately. And I will have more to say about the positioning at the April meeting in the next round. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President George.

MS. GEORGE. Thank you, Madam Chair. Weakness in the ag and energy sectors continues to weigh heavily on the Tenth District economy, and growth has diverged between states that are dependent on these sectors and those that are not. Farm income is expected to weaken modestly in 2016, marking a third consecutive year in the current downturn. Demand for credit continues to rise. And despite reduced cash flow, balance sheets continue to be bolstered by high farmland values, which have only modestly declined.

In energy-dependent parts of the region, the downturn in the energy sector has spilled over to other segments, such as consumer spending and residential construction activity. The financial condition of many District energy firms has also continued to deteriorate. In recent weeks, credit ratings have been downgraded, including a four-notch downgrade to one of the largest energy companies headquartered in the District, pulling its debt below investment grade for the first time. District manufacturing and export activity continues to contract, and our manufacturing index has fallen to its lowest level since the financial crisis.

With significant layoffs in energy, anecdotes from our District contacts, however, suggest some of the workers are finding other jobs. Nationwide, I would note the number of jobs lost in this sector since September 2014 has outstripped the number of job losses in this sector during the Great Recession. However, analysis by my staff suggests that energy-sector workers appear to have had an easier time finding employment over the past year than they did during the recession, and at better wages. Other than ag- and energy-intensive areas, the District economy is performing well, with employment expanding, wage growth strengthening, residential construction activity accelerating, and leisure and tourism improving. One of our directors, who is from a major railroad shipping company, reported declines in energy-related shipments but also noted improving activity in automobile, chemical, and lumber shipments.

On the national outlook, my forecast has changed little since our previous meeting. Despite another bout of volatility in global financial markets, which has at least temporarily dissipated, I expect growth to step up from about a 2 percent rate in the first half of the year to 2½ percent in the second half as the drags due to energy-related investment cuts and inventory overhang run their course. The outlook for consumer spending looks particularly solid to me in light of the recent data on consumption and employment. Hiring appears to have somewhat more momentum than I expected, and there is now clearly some upside risk to my medium-term growth forecast if wages rise more than expected as firms compete to fill their openings. With the quits rate back to its pre-recession average and the hires rate just slightly below its pre-recession average, I agree with the Tealbook's assessment that the employment gap is essentially closed.

Another positive labor market development has been the increase in labor force participation of prime-age workers over the past six months. My staff has looked at this prime-age cohort that transitioned from being outside the labor force to being employed in 2015 and found that reentrants were more likely to be highly educated. Although this is a positive development for labor markets, the available pool of such potential workers is limited. So as this well-educated, flexible pool of workers shrinks, employers will need to curtail hiring or dig more deeply into the pool of the unemployed for new hires. I suspect it will be a mix of both. So I have lowered my unemployment rate forecast in the medium term, although I still anticipate employment growth to slow from its current pace in the future because of slower growth of the working-age population.

Of course, there are risks to this outlook originating both domestically and abroad, and I remain attentive to these expectations. Appealing to the wit of the late Alfred Kahn, my staff, too, has been evaluating whether the economy will experience a "banana" in the near term. I knew there was a risk to this kind of a joke.

MR. TARULLO. It's no longer a risk, Esther. [Laughter]

MS. GEORGE. I know. I've gotten the answer that I worried about there.

I continue to watch signals stemming mostly from the energy sector and the effect on financial conditions as well as elevated levels of inventories. However, the positive slope of the Treasury yield curve and strong job growth relative to the slower underlying trend due to demographics do not seem consistent with the near-term, broad-based downturn. And although foreign growth could certainly disappoint or be an ongoing source of concern, modal forecasts are for it to strengthen in 2016.

Regarding inflation, although the strong reading for core PCE price growth in January may have resulted in part from residual seasonality and other temporary factors, as the Tealbook concludes, I would also note that the four-tenths increase in the year-over-year growth rate since last year has been relatively broad based. Previous health-care payment changes were a contributing factor, but about half of the increase can be explained by stronger durable goods price growth. Other measures, such as the Federal Reserve Bank of Dallas trimmed mean PCE inflation rate and the Cleveland Fed's median CPI, have increased, suggesting the rise in core PCE was not primarily due to idiosyncratic factors or issues related to seasonal adjustment.

Inflation expectations appear to be relatively stable, although we must remain attentive to signals to the contrary. I take some comfort that, as noted in the Board staff's memo and from my own staff's research, we have seen declines in the number of forecasts predicting higher than 2 percent inflation—a positive development—and have seen relative stability in the lower end of the distribution. Also, the distribution of individual longer-term inflation expectations is currently similar to the distribution that existed before the financial crisis.

Finally, as it relates to household views on inflation, I don't read too much into the University of Michigan Surveys of Consumers. Its measure of longer-term inflation expectations is highly correlated with gasoline prices, so it moves dramatically to news about near-term inflation. In fact, when you drill down to the actual survey questions, I wonder how well consumers are able to respond to the time-frame dimension. For example, the question "What about the outlook for prices over the next 5 to 10 years?" is then followed by a flow chart to elicit more detail. So although consumer expectations bear watching, I am cautious about taking too much signal from small moves in this measure in terms of evaluating the anchoring of long-term inflation expectations. Thank you.

CHAIR YELLEN. Thank you. President Lacker.

MR. LACKER. Thank you, Madam Chair. Economic conditions in the Fifth District appear to have strengthened in recent weeks. Preliminary readings on our March surveys are quite positive. These won't be released until next Tuesday, so these are preliminary numbers, but the number of responses is pretty high. The manufacturing index rose from negative 4 in February to positive 10, with strong readings for shipments, new orders, and hiring. Similarly, our service-sector survey rebounded strongly from negative 2 in February to positive 10 in March. The retail revenue and shopper traffic numbers were particularly strong.

Comments from our directors and roundtable members were also more positive than in January. Reports from retailers were generally upbeat, particularly for auto dealers. Labor markets were said to strengthen in the District, and reports of difficulty finding qualified workers continued. One contact noted that there was an increased availability of workers in their area due to an influx of laid-off energy workers from the west, so perhaps the Fifth District's gain is the Tenth District's loss. Residential real estate contacts were upbeat as well, except for concerns about the supply of buildable lots in some locales. And commercial real estate appears to be strong across all segments: industrial, multifamily, office, and retail.

With regard to the national economy, I submitted a projection of real GDP growth in 2016 that's just a little bit below what I submitted in December—2.1 percent. This mostly reflects a somewhat lower path for business fixed investment early in this year. My outlook reflects an assessment that the downside risks to U.S. growth that we saw in January and early February as a result of global economic and financial developments have largely dissipated, and I see them as having few downside implications at this point. The strong consumption growth we saw last year was an important influence on my December projections, and I believe the fundamentals for housing spending remain solid. Labor markets have continued to strengthen, and the recent numbers on consumer spending have confirmed that outlook. In particular, the strength of vehicle sales and consumer sentiment indexes suggest that U.S. consumers have not been deterred by financial market developments. Residential investment also appears to be on track for strong growth this year.

Business fixed investment, however, has been soft lately, largely attributable to falling energy prices and the strong dollar as well as broader concerns about global economic growth. This is one area in which you might expect to see significant fallout from the weakness in U.S. equity markets or global growth concerns more generally, but the effect so far appears to be limited. We have not heard any reports of material cutbacks from our District contacts, for example. Some others have reported that as well. And respondents to the Duke business school's CFO survey for March, released just last week, expect an average of 2.0 percent capital expenditure growth for this year, down from 2.6 percent for the previous survey in December. And this hardly constitutes a massive cut in spending plans. It's still consistent with an economy growing near trend. All of this is in line with the Tealbook's forecast that equipment and intangibles investment will show more strength in the second half. The dollar has retraced in recent weeks, and I expect somewhat less drag due to net exports this year than I did in December—again, consistent with the Tealbook.

The continued strength in labor markets has been remarkable, with employment growth continuing to outpace growth in the working-age population. For this year, I expect job growth to slow to levels closer to labor force growth as the unemployment rate bottoms out and moves back toward its longer-term level, which I estimate to be close to where it is right now. Now that the unemployment rate is at or below most estimates of the natural rate and labor force participation is close to estimates of its trend, the share of those working part time for economic reasons is one utilization indicator that remains somewhat elevated relative to pre-recession levels. But we shouldn't look at this measure in isolation. For example, job openings are significantly above pre-recession levels relative to hires or the labor force, which suggests that something other than cyclical factors or deficient demand is keeping the measure of those working part time for economic reasons elevated.

With regard to inflation, it's certainly possible that the strong January number will turn out to be transitory. That said, the pickup in January was spread pretty broadly across PCE components, and that leads me to place somewhat more probability on inflation returning to 2 percent faster than we've been expecting. The stability of longer-term inflation expectations is clearly critical to our confidence that inflation will return to target over an acceptable horizon. And I appreciate the staff memo. It provides a comprehensive review of some of the subtleties involved in estimating longer-term expected inflation. TIPS-based inflation compensation has been weak in recent months, although it has rebounded in recent weeks. Extracting measures of expected inflation from observed inflation compensation requires making assumptions of one sort or another, and the results can be sensitive to the assumptions one chooses.

At this point, I'm persuaded by the analysis I've read that most of the variation we've seen in the inflation compensation numbers is attributable to movements in risk and liquidity premiums, and that expected inflation has been relatively stable. Across an array of financial markets, risk premiums have been found to account for a significant portion of the variation in prices, and this is despite the fact that in models, for convenience, we typically make assumptions that imply conditional variances are fairly stable. So I don't think it should be a surprise if these premiums are driving fluctuations in breakevens, particularly during episodes of greater volatility in financial markets more generally. A sizable share of the recent decline in these premiums seems to me to be plausibly attributable to flight-to-quality in response to global developments. And if so, I think we should expect to see the compensation measures move back up as global uncertainties continue to subside.

Survey measures of expected inflation have also moved down recently, and these presumably are free from the confounding effects of risk premiums. The staff memo points out, however, that consumer-based survey measures tend to react strongly to retail gas prices, as many others have remarked this afternoon. And when they adjust the Michigan survey for such effects, the resulting measure is more stable and has not fallen below 2 percent. Expected inflation from surveys of professional forecasters are also more stable and are not below 2 percent. So I still see 2 percent as the effective attractor for inflation over the medium term, and I remain reasonably confident that, barring unexpected developments, inflation will move up.

To sum up, like many of you, my outlook for growth and inflation is very close to my December outlook. As a result, I'm left wondering why our projected policy rate path would be revised down by much. Presumably, we'll discuss this tomorrow.

CHAIR YELLEN. Governor Powell.

MR. POWELL. Thank you, Madam Chair. In the past six months, financial markets have experienced two significant meltdowns in which volatility spiked, commodity and equity market prices plummeted, the dollar rose, and credit spreads increased substantially as investors fled from risk assets. Both episodes were tied to concerns of much weaker growth in China and the related possibility of significant depreciation of the RMB—concerns that connected to fears of broader global weakness. In both cases, the tightening in financial conditions abated by some measures after a period of turmoil. But the recurrence of these episodes nonetheless suggests caution to me for the time being.

China's management of the RMB exchange rate may be just reaching a more stable footing, although it's too early to have comfort in that. China seems, for now, to be papering over the hard issues that it confronts in its ongoing economic transition. Although these issues will be daunting in the medium term, it is probably still true that China can muddle through in the short term despite a troubling and unsustainable buildup of debt, and risks of even slower growth remain in the near term.

The picture for other emerging market economies is also a challenging one, and the outlook for many advanced foreign economies has also weakened, for example, in Europe, Japan, and Canada. The ECB's strong actions announced last week are welcome but, nonetheless, a sign of deep concern, and the Bank of Japan's surprise deployment of negative rates has so far not been well received by the markets. The question of whether central banks may be running out of tools is very much in the air.

For the United States, of course, the picture remains a better one. In January and February, U.S. market participants were highly focused on the likelihood of a recession in 2016. Many well-known outside economists wrote pieces addressing that question, generally concluding that recession probabilities had increased but remained low. And that is also the view of the fine staff memo distributed before this meeting. Meanwhile, U.S. economic readings have held up reasonably well. For us, the tightening in financial conditions has been unwinding now for over a month, and conditions are now about where they were in December. Job growth has remained strong, as has consumer spending. Both household and business sentiment have held up reasonably well. After a sharp correction, leveraged finance markets have settled down and show some early signs of recovery. Spreads have come back in significantly but remain far from fully recovered, and contacts suggest that the pipeline, which was nearly empty a month ago, is showing signs of increased activity.

So with that background, my modal forecast hasn't changed much since the December SEP round. I see growth continuing at around 2 percent, modestly above potential. I see continued strong job growth. The Tealbook calls for a sharp increase in labor productivity growth from the five-year average of 0.5 percent to around 1½ percent in 2016. And I have stuck with a more-of-the-same approach instead, with productivity increasing but on a more gradual path. As a result, with the continuation of strong job growth, my unemployment rate falls to 4½ percent by the end of this year and edges down further in the out-years.

I'm also very encouraged by the welcome increase in labor force participation. Looking through the ups and downs, labor force participation has now been flat for two and a half years in the face of an estimated trend decline of roughly 30 basis points annually. Of course, these readings are noisy, but this kind of an increase would be consistent with the pattern of the past two recoveries in which labor force participation rose above the underlying trend late in the cycle, and that would be a particularly desirable and welcome result in this recovery.

On inflation, the achievement of our 2 percent objective has once again shifted a bit further out. I am comfortable with the Tealbook projection, with inflation rising gradually as the effects of lower oil prices and the dollar's rise eventually fade and the economy tightens. The reversal of these transient effects should eventually raise underlying core inflation close to the 2 percent objective. More fundamentally, though, it is essential that inflation expectations remain anchored around 2 percent, as I believe they are today. For that to remain true, the Committee must be credibly committed to bringing inflation back to 2 percent. I will add that I find that the staff memo buttresses my view that the low market-based measures of inflation expectations need to be handled with care and should not be given more prominent discussion in our communications.

Although the modal outlook for the U.S. economy is broadly the same as it was in December, the balance of risks, in my view, has shifted to the downside. In particular, I continue to see the external sector as an important downside risk. Overall, the risk of a global recession has increased. We will feel weak global demand. In addition, weakness abroad in the context of ongoing easing by other major central banks may put further upward pressure on the dollar. Weak global growth is likely to put a relatively low speed limit on our growth and on the pace at which it will be appropriate to raise interest rates. More on that tomorrow. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kashkari.

MR. KASHKARI. Thank you, Madam Chair. The Ninth District economy continues to perform relatively well. Employment is strong in the region. The unemployment rate in Minnesota, for example, is 3.7 percent. The global decline in commodity prices, however, is having a notable impact on my District. Our contacts report that depressed commodity prices, the strong dollar, and a slowdown in global trade have taken a toll on agriculture, mining, heavy equipment producers, and transportation firms that ship those commodities. The sustained drop in oil prices is having a very heavy weight on the oil-producing economy of North Dakota. In addition, more than 2,000 workers in Minneapolis's Iron Range region have been laid off over the past year, as firms have idled mines and processing plants largely in response to declines in iron ore prices and in demand.

On the positive side, the construction sector and the health services sector are strong, and companies in the District in the food processing, aircraft, fertilizer, electronics, and medical devices industries have all recently announced large investments and plans to increase employment.

At the national level, the economy's performance has also been uneven. The labor market continues to show strength, with unemployment at low levels and payroll employment growing substantially. As Governors Powell and Brainard and others have noted, the uptick in the employment-to-population ratio and the labor force participation rate is clearly a good thing. You know, in recent years, many people have been focused on the prospect of a lost generation of workers as the long-term unemployed became permanently unemployable. I don't want to overreact to near-term data, but it is unquestionably a good thing that we're seeing people come off the sidelines and back into the labor force, and I would encourage us to continue that process as long as we can get it to go because it's a big benefit for society.

Inflation is more concerning, however, despite the recent uptick. As many have noted, inflation is still running below our 2 percent target, and continued undershooting of the target could push down inflation expectations. As others have noted, inflation expectations are edging down in surveys and in market-based measures. Such mixed signals for the national economy are especially worrisome in the context of elevated uncertainty in financial markets and in foreign economies. Uncertainty about China's economic and policy outlook continues to be a risk for the health of emerging markets and financial markets in general.

The Tealbook, as we discussed, reports an increase in the probability of a global recession. Softening of euro-area economies with the added uncertainty about a potential Brexit has prompted a strong response from the ECB. But that action only highlights the divergence between our own monetary policy and those of other major central banks—a divergence that poses downside risks for the U.S. economy, including the potential for further appreciation of the dollar.

In summary, I view the U.S. economy as gradually recovering, but the mixed signals for labor markets and inflation in the context of global risk tell me that the uncertainty continues to be elevated. Thank you.

CHAIR YELLEN. Thank you. Governor Tarullo.

MR. TARULLO. Thank you, Madam Chair. Like most, if not all, of you, I find that my assessment of the economy hasn't actually changed much since we did the December SEP, notwithstanding the interesting three-month interval. My baseline expectation is still for the U.S. economy to chug along with modestly above-trend growth. There's obviously been, first, volatility and then the stabilization in financial markets between the December SEP and today. As several of you have pointed out, that stabilization probably has at least something to do with the recalibration of people's expectations as to what our policies are going to be.

So I want to say a few things in the remainder of my remarks about labor markets, inflation, and the balance of risks. With respect to labor markets, I just wanted to recall that a couple of years ago we were still having a very active debate around this table as to whether the unemployment rate was capturing reasonably well the amount of slack in labor markets. And some of the issues we were debating at the time included whether there had been a substantial increase in structural unemployment and whether the long-term unemployed would mostly transit out of the labor market completely and, thus, couldn't really be counted as part of labor market slack.

In retrospect, it seems quite clear that the unemployment rate did not totally capture the amount of slack that was in the labor market and that it did, indeed, reflect dominantly cyclical factors and not an additional quantum of structural unemployment. I think that the way in which the labor market continues to improve suggests that there is some slack remaining, though, obviously, considerably less than when we were having those debates a couple of years ago.

Now, people have noted the continuing anecdotal reports about difficulty in finding qualified people. You know, I literally was thinking about one of my very first meetings in my first job in the government, which was with a group of auto and steel executives. This was in 1979. And what I still remember from that meeting is one of their complaints—imports was at the top of the list, but right after that, they couldn't find qualified workers. And I have to say that in the intervening years, in every government policy job I've had, that is a perennial complaint of all employers. They can never find qualified workers, and so I think we're always going to continue to hear that, and we've got to look at data to determine the degree to which that's really translating into economic performance.

I would also say that there's a reasonably good relationship between periods in which employers really do have trouble finding qualified workers and, thus, are confronted with either having to raise wages or find productivity increases. And one of those two things usually results when labor markets really do tighten to a substantial degree. I would expect that we'll see some combination of those in the quarters ahead.

So adding a couple of points to those that Lael already made on the hypothesis of some continued slack, well, job creation continues to average more than 200,000 a month. Metrics such as the average workweek and people working part time for economic reasons have been essentially flat over the past six months, suggesting that the ways in which labor markets are improving are such as to be drawing on some slack and not eliminating it.

The number of those out of the labor force but wanting a job is still somewhat elevated. And now I've got a new little analytic observation to put into the mix, since everybody is getting tired of hearing about PTER and the average workweek. This one our labor economists drew to my attention. It's a little obscure, but it's actually pretty interesting. They point out that although folks have focused on those who are out of the labor force and want a job, the much greater group out of the labor force are those who say they don't want a job. And yet approximately 4 percent of that group continues to transition into employment. And if you look at just prime-age workers, this number is over 6 percent and has been rising over the course of the past year. So as the labor market improves, and as employers are more motivated to look for workers, even those out of the labor force, oftentimes through informal mechanisms, are recruited back in—a situation that suggests, once again, that there's still some slack remaining, although obviously not an enormous amount. And as a number of you have already noted, a pickup in wage increases is still largely in the realm of anecdote despite a couple of data points to the contrary, which have been given to us and then taken away.

On inflation, I'm still not at the point at which I can have reasonable confidence that inflation will return to 2 percent within a reasonable period. Though let me be clear—I don't think the prospects for achieving this goal have worsened since December, and I think they have actually probably increased a bit along the way and obviously will be strengthened further still if the one-month increase portends more of the same, contrary to current staff expectations.

The staff estimate that the waning of the energy and dollar effects, which are clearly lingering longer than many expected, will get us only about halfway from the current core PCE inflation rate to the 2 percent goal, and it seems reasonable to expect some effect from further reductions in the output gap, though how much is difficult to say, absent faith in the return of a considerably steeper Phillips curve. So the remaining work has to be done by overshooting, by the work of expectations, or by some combination thereof. Expectations have recently bumped off their lows, but both market- and survey-based expectations are still toward the low end of historical ranges. This is a global phenomenon, which some market participants and commentators attribute, in part, to skepticism that central banks will be able to achieve their inflation goals. And recently, at least—and I am relying here on, I think it was a really good New York Federal Reserve Open Market Desk survey of developments in inflation expectations—it doesn't appear that liquidity considerations can account for the recent declines in inflation compensation.

We're in a global environment of persistently low inflation with some continuing risk of further disinflation. In the United States, the combination of the slow waning of some factors and the indeterminate pull of increasing capacity constraints may get us closer to 2 percent. But as I mentioned a moment ago, some further energizer is needed, at least in the staff projection, for that final ¼ percentage point from 1.75 to 2 percent.

So those are the reasons why, at this point, I'm still not in the "reasonable confidence" camp, though I may yet get there. I thought it was useful, though, for my own thinking to consider the other side. What are the risks that inflation gets away from us if my absence of reasonable confidence proves to have been—I guess it wouldn't be misplaced, because it's an absence—if I should have had reasonable confidence sooner than I did.

I asked the staff to do an alternative scenario that incorporated some pretty optimistic inputs about what would be happening in the U.S. economy, and these are the three key ones that I specified for them. One is that the U.S. dollar is immediately 10 percent lower in real terms and remains so through the simulation. Two, oil prices are up $20 a barrel from the beginning of and through the simulation. And, three, aggregate demand is boosted so that the output gap is 1 percent above the baseline by the end of 2016.

The results of the simulation? First, total PCE inflation was about ½ percentage point higher by the end of this year—that's dominantly the effect of oil prices—and then about 20 basis points higher in each of the next two years, which is primarily the effect of the lower dollar but also a little from overheating. Second, core PCE inflation is only slightly above the baseline in 2016 since oil doesn't have that much effect, obviously, on the core. But even in 2017 and 2018, core is less than 20 basis points higher, mostly attributable to the dollar and the stronger economy. In the simulation, just to give you some context on the real side, GDP was, on average, ½ percentage point higher through the period, and the unemployment rate was about ½ percentage point below the baseline by the end of this year, remaining at that interval through the next two years. And, finally, the simulation pulled the federal funds rate up about 80 basis points above the baseline by the end of 2018. Now, actually, that looks like a rather nice outcome, if we could get it. But for me, the key point is that it's hard to see inflation getting away from us even with substantially different real economy outcomes than any of us believe are likely at this time.

Now, as in all simulations using the staff model, the impact of expectations in holding changes in actual inflation back is pretty significant. So if expectations become unanchored or if, as I have wondered from time to time, the inflation expectations hypothesis turns out to be more a matter of correlation between measured expectations and actual inflation over the past 20 years than it does a matter of causation, then the increase in inflation could be greater than that produced by the alternative scenario. But if you want to postulate the unanchoring of expectations after a relatively brief period of rising inflation, I think you need to explain why that would happen after seven years in which lower-than-target inflation and apparently substantial patience by the FOMC in getting back to 2 percent has produced only a flirting of expectations with historic lows rather than their becoming unanchored.

And I just have to note in passing that as I listen to the conversation around the table, people have now cumulatively disrespected both market measures of expectations and survey measures of expectations, and yet everybody continues to say that expectations are really important, except that we just don't trust the measures of them. But I'll just let that pass for the moment.

Now, if you don't think that expectations have that much effect on actual inflation, then what's your theory for explaining the past seven years and why we haven't been doing more to return to target if you don't think that expectations are going to pull us back that way? I hardly need to speculate as to what some members of the Committee would be saying had we been above target for even a year during that period, much less for seven. So if you're sticking with the expectations theory for inflation, I think this alternative scenario should give you considerable reassurance. And if you're not, and you want to come over to my self-described pragmatic approach and be more sensitive to actual developments, that's great. I welcome the converts. But I think it's hard to conclude in either case that there's a large risk of inflation getting away from us if and as we follow appropriate policy, should a sustained uptick become apparent.

Finally, to risks. Domestically, I agree with President Williams that risks are roughly balanced. On the upside—I'm not sure this totally correlates with yours, President Williams, but I think they're consistent—some dissipation of uncertainty in the global economy would probably have a confidence effect. If wage increases do pick up, as many expect, that should support aggregate demand even with a somewhat slowing pace of employment growth, and that, in turn, might prompt a little bit of acceleration of business fixed investment, which, as a number of you noted, has been lagging somewhat.

On the downside, we've seen some signs of slowdowns in some spending categories. Some survey-based measures of hiring expectations are edging down. The ISM nonmanufacturing index and, most importantly, the orders component of that index have been trending down for about six months now. So there are some signs that maybe things are slowing a little bit, notwithstanding the fact that there are other signs that things may be picking up.

Eric, I'm not sure you were positing banks as a downside risk or not, or it just was sort of a financial stability observation, but to the degree it was a downside risk, I'm not sure I totally agree. I do agree with your assessment of the global banks. But with the U.S. banks, I actually didn't see as close a correlation with short-term wholesale funding and the relative equity declines of the banks. I'll tell you, the correlation I saw was rather more closely with the banks whose business models are being met with the most skepticism in investor markets as to how profitable these institutions are going to be in the new economic and regulatory environment that they currently occupy. And so in at least one case, a bank that's not overly dependent, relatively speaking, on short-term wholesale funding continues to take the biggest hits to its equity price and even to its CDS spread. And I think—but this is just a hypothesis—it's probably got more to do with whether you can be profitable, whether you have to make more changes, particularly as more regulation directed at the SIFIs comes online.

But if risks are roughly balanced domestically, I think internationally they're decidedly weighted to the downside. It's not like the global economy is falling apart, and Beth Anne made this point, I think, in her initial remarks. I agree with those of you who have said that markets probably overreacted both late last summer and in the January–February period. But the ECB and the Bank of Japan are both struggling to produce a monetary policy that achieves even very modest growth. There's essentially no chance for a rapid pickup in growth in those rather important economies.

China should be okay—I think Governor Powell hit the nail on the head. For the next six months or so, China should be fine. I'm pretty certain that nothing bad is going to happen between now and the G-20 meetings. But after that, there are some problems that they're going to have to confront, and they pose as more of a medium-term risk. And, again, there's not all that much upside risk that they're going to go back to 9 or 10 percent growth over the next several years.

Emerging markets are in an extended period of readjustment to less-attractive export markets due to China's slowing, sluggish growth of mature economies, the related end of the so-called commodity supercycle, and the big shifts in capital flows that have occurred over the past couple of years.

Again, it doesn't seem as though a crisis is likely. You know, even in Brazil, the economics suggest hard times rather than a crisis, although politics may push them over the edge. But it's still a very vulnerable position, and that's the way I assess the global economy more generally. The baseline is not for a global recession, although I found the staff work that Beth Anne presented very valuable in thinking about the increased risks. But the odds are up, to some degree—exactly how much, we don't know—and most importantly, from my point of view, the world economy is very vulnerable to any form of adverse shock, whatever its origin, whether it's economic, geopolitical, or something else that we can conjure up. And, thus, we would see not only the modeled effects on the U.S. economy, which will probably only be moderate, but, as Rob points out, some of the flow through to the earnings of U.S. companies, which are increasingly important, and also the harder-to-quantify but very real risk-off sentiment that would occur if you had that kind of global reaction to some external shock. So it's for that reason that, while not wanting to overstate it, I think the risks really are on the downside globally and pretty significantly so, thereby offsetting, in my mind at least, the roughly balanced risks that you'd see if you just looked in an insular fashion at the United States. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you, Madam Chair. Well, we're pretty much like everybody else. We haven't changed our forecast of growth or inflation much for 2016. On the growth side, we've lowered GDP growth a couple of tenths to 2.1 percent fourth quarter over fourth quarter. That reflects several factors, including the weaker foreign growth outlook and the fact that there's even wider corporate credit spreads.

On inflation, we haven't made meaningful changes to our forecast. There are crosscurrents here that we've discussed. On the one hand, the January core PCE reading was quite a bit firmer, so that pushed the year-over-year rate up to 1.7 percent. But I don't put much weight on that, because it's due mainly to one month's reading. I'm sympathetic with the Board staff's assessment of this, that we should discount it until we get some more information. But at the same time, the fact that the core PCE trend has been flat to higher during a period when we've been hit with effects of the firmer dollar and lower energy prices, I do take some signal from that, that we're not really suffering a lot of disinflation either. On the other hand, inflation expectations continue to concern me. They are still soft. Now, maybe this reflects just the drop in energy prices, which is obviously not a big reason for concern, but maybe it reflects the fact that we've been running below 2 percent now for some time and this is beginning to weigh on inflation expectations. If that's the correct explanation, then we have to give some weight to that in our decisionmaking.

On the positive side of the ledger, the New York Fed's Survey of Consumer Expectations came out yesterday for February. I think Governor Brainard referenced this. It showed an uptick in both the one-year and three-year median inflation expectations. We were at the all-time low for this survey, but the one-year ticked up to 2.7 percent from 2.4, and the three-year, to 2.6 percent from 2.5. That said, these figures are still very low relative to the past history of the surveys, but I view the upticks as mildly encouraging.

In terms of our federal funds rate projections, we continue to show two 25 basis point increases in 2016, but we flattened out our federal funds rate trajectory thereafter with three increases in both 2017 and 2018, down from four in each year previously.

It strikes me that the road back for Europe and Japan is going to be longer and more difficult, and that suggests more persistent drag on trade for us. The fact that we're only growing at about a 2 percent pace even with stimulative monetary and fiscal policies in place suggests to me that the headwinds persist, and they may be likely to abate even more slowly than I earlier anticipated. Even with my lower federal funds rate forecast trajectory, this does still imply a pretty significant rise in long-term interest rates at some point. I think we need to take that into consideration. When the 10-year Treasury yield is below 2 percent and most of us have 10 increases in the federal funds rate taking us to 3 percent or so over the next few years, that does imply a pretty significant rise in long-term rates at some point, and that is going to have consequences for financial conditions. When I look at the valuation of financial assets, for me it all starts with long-term bond yields. Things don't look overvalued relative to long-term bond yields, but, boy, long-term bond yields look pretty rich relative to what we think is likely to actually happen for monetary policy looking forward.

In terms of risks to the outlook, I continue to see them skewed to the downside for both growth and inflation. This stems mainly from my concerns about the foreign outlook and how this might spill back to the United States. Although financial markets have recovered somewhat in the past few weeks, it's important to remember that the market turbulence we saw earlier in the year was not just about animal spirits. There really are still a number of significant open issues in terms of the foreign economic outlook. To name just a few, we have China's growth prospects and its currency policy. We have the efficacy of negative long-term interest rates in Japan and Europe and the related question of whether Japan and Europe are running out of monetary policy ammunition. And, if so, what are the implications on household and business confidence in those areas? Then we have commodity price weakness and the pressure this puts on commodity-exporting countries and commodity producers. And there's a smaller issue that we haven't discussed today, Brexit, and all of the uncertainties associated with that.

Sentiment has improved, no doubt, but most of the underlying issues driving the earlier tumult in financial markets still seem quite relevant and pertinent to me. So it seems to me the markets can reverse just as quickly as they recently improved. And in some ways, the concerns about the absence of further firepower on the monetary policy front means if you do get hit with an adverse shock, the consequences for household and business sentiment could turn out to be more powerful than what people anticipate.

My particular concern is that the negative interest rate policies in Japan and Europe are not really working well to stimulate demand and lift inflation expectations. While it's true that the negative interest rate policies do appear to provide support to the economy by shifting down the yield curve—and bond yields in Japan and Europe have fallen to levels that I view as basically almost inconceivable—they seem to be offset by some other negative factors. The first is that the drop in yields is threatening to crimp bank net interest margins and squeeze bank profits. The second is that the negative yields, I think, do send a bad signal to households and businesses about the outlook. Households, even when shielded from negative interest rates, may decide they need to save more, in light of the poor expected returns that they can anticipate on their current and future savings. That doesn't receive much emphasis, I think, when people talk about this. I'm also not convinced that the negative interest rate policies provide appreciable stimulus, on net. That's especially the case with any currency depreciation benefit, which was really the original motivation for these policies, either to generate currency depreciation or prevent currency appreciation. If all of the countries are pursuing a negative short-term interest rate policy, most of that currency benefit gets canceled out.

Now, in terms of the running-out-of-ammunition story, I think the earlier response to the ECB's actions last week was quite illuminating. After initially responding quite positively to the fact that the ECB's actions were significantly larger and broader than anticipated, the focus turned quickly back to Draghi's remarks, which implied that no further short-term interest rate reductions were contemplated. This suggested to some, rightly or wrongly, that there was not much ammo left, and I think that's really what people found disconcerting. The way I reconcile the market reactions to the ECB moves last week—and I don't think it's easy to reconcile or explain the reactions—is by interpreting them to mean that there was sort of good news and bad news. The good news was that the ECB was aggressive. The bad news was that there's presumably not much left in the toolkit.

If inflation expectations were less damped and the international situation was less unsettled, I would favor tightening at this meeting, actually. But, to me, the risk-management considerations argue for caution right now. Clearly, tightening at this meeting at this point would provoke an undesirably large tightening of financial market conditions. This is especially a risk, as the likelihood of tightening at this meeting is judged as negligible by market participants. In my view, one reason why financial conditions have eased recently is precisely because market participants now judge we are likely to go more slowly. So that means if we don't go more slowly, it's probably going to generate a significant tightening of financial conditions. So we do need to consider that in terms of the path of policy that we pursue.

In my mind, the way I think about it conceptually is that Japan and Europe are now going to follow an easier-for-longer path, and if we were to follow the same monetary policy path that we thought we were going to follow in December, the divergence between us and them would be greater, and that would probably lead to a greater tightening of financial conditions than what we thought at the time of the December meeting. So in view of the fact that they're going to be easier for longer, then we need to maintain the same degree of divergence in policy from them. To do that we have to actually lower our federal funds rate path, and that's really what the SEP numbers seem to show.

In terms of where we're going from here, I think that there is a good chance that the foreign situation could remain stable or improve, and I think inflation expectations could stabilize and increase. And if all of that happens, then I would be inclined to move again in the near future, presumably at the June meeting. I wouldn't rule out April categorically, but that seems a high bar to me. Moving at a non–press conference meeting would imply an urgency to tighten that I think I'd find difficult to justify under the current set of circumstances. Also, it would be a big surprise. The Open Market Desk surveys indicate market participants put a very low weight on April and a considerably higher likelihood on June. But I'm jumping the gun a little bit, so more on monetary policy tomorrow.

CHAIR YELLEN. Okay. President Williams.

MR. WILLIAMS. I'd like to ask a question of the Vice Chairman. When you think about the ECB's actions and the comment you just made—you talked about Japan, too, but let's just take the ECB, case by case. So in light of the ECB's action of lower for longer, more of a stimulus, that means that we should, all else being equal, have a lower path for the policy rate. It kind of reverses my view of the lesson that we had when we did easier monetary policy in, say, 2012, for which the argument is, that's actually good for the global economy, it's good for other countries. So let me ask you the thought experiment, which you put out on the table—say, the ECB, given everything else being equal, did nothing at their meeting or did less. Would we, therefore, have a tighter path of policy?

VICE CHAIRMAN DUDLEY. But this is subject to their economic outlook.

MR. WILLIAMS. I know, but I'm just—

VICE CHAIRMAN DUDLEY. If they did less, they would have a worse economic outlook. They're doing this to generate an economic outlook similar to the economic outlook that they had before. So I'm holding the economic outlook in Europe essentially unchanged.

MR. WILLIAMS. So the real argument that you're making was not about the policy action—there was bad news in Europe and, therefore, we need a lower path of interest rates.

VICE CHAIRMAN DUDLEY. They need a lower path of interest rates to generate outcomes that are—

MR. WILLIAMS. I just wanted to clarify, because the way you said it was—

VICE CHAIRMAN DUDLEY. That's fair. That's fair.

MR. WILLIAMS. I think it actually goes the other way. I think that what they've done was very strong, and that's good for the global economic outlook, conditional on the same economic data.

VICE CHAIRMAN DUDLEY. Right. But the fact that they had such a strong policy reaction was because the outlook in Europe had actually deteriorated. That's how I—

MR. WILLIAMS. I do see. I just wanted to clarify, because you don't want to get into this game—

VICE CHAIRMAN DUDLEY. No, I understand.

CHAIR YELLEN. Okay. My thanks to everyone for an interesting round of reflections on the economic outlook and risks. And, if you don't mind, before we break for dinner, I'd like to wrap up with some comments of my own, including some observations on the policy implications of economic and financial developments over the past few months.

Let me start with the labor market, which I would characterize as showing further solid improvement since the December meeting. Monthly payroll gains have averaged close to 230,000 over the past three months. The unemployment rate ticked down one-tenth and would be lower, if not for a most welcome increase in the labor force participation rate. U-6 is down 0.2 percentage point since our December meeting, and the employment-to-population ratio has risen almost ½ percentage point.

Some other cyclical indicators that I track also suggest that we're more or less back to a normal labor market. The quits rate has returned to its pre-recession level, as have households' perceptions of job availability and firms' assessments of the difficulty of filling jobs. Nonetheless, I put myself in the camp of those who argue that there remains some scope for further improvement. The unemployment rate is still a bit above my estimate of its longer-run level, and voluntary part-time employment for economic reasons remains somewhat elevated and has changed little in recent months. In addition, the unexpected pickup in the participation rate reinforces my optimism that a tight labor market will draw more people into the labor force permanently, thereby boosting the economy's productive capacity.

Finally, although there are many anecdotal reports of faster wage increases, the aggregate data still reveal few, if any, signs of upward pressure on wages beyond some selected job categories. While the link between nominal wage growth and slack is quite loose, I would, nonetheless, have expected some rise in nominal wage growth in response to the marked tightening of the labor market over the past two years. For these reasons alone, I'd like to see further declines in the unemployment rate and improvements in other measures of labor utilization. But I also consider a tighter labor market as important to speed the return to 2 percent inflation.

Indicators of spending indicate that household spending continues to be a relative bright spot in this economy, although a little less so in light of this morning's marked downward revision to retail sales in January. Still, retail sales were up modestly in February for the control category used to compute PCE, and light motor vehicle sales have continued to run at a high level.

Factoring in projected gains and outlays on services, the staff now estimates that consumer spending is likely to increase at 2½ percent at an annual rate this quarter, which remains a respectable pace. In addition, residential investment continues along a path of gradual recovery.

Finally, as the Tealbook points out, the fundamentals underpinning near-term growth and household spending look reasonably good, in light of recent gains in real disposable income, an elevated ratio of household wealth to income, lower mortgage rates, and a relatively high level of consumer sentiment.

In contrast, spending and production indicators for other sectors of the economy have been weak. Orders and shipments of nondefense capital goods have been essentially flat for some time. Recent readings on business sentiment have been lukewarm at best, and some surveys suggest a weakening in planned cap-ex. I found President Lockhart's comments about his survey interesting in that regard. Drilling and mining activity continues to contract at a rapid pace under the weight of very low oil prices. As the Tealbook noted, most other components of nonresidential construction have been soft. Finally, the latest monthly trade data indicate that the combination of dollar appreciation and slow foreign growth continues to hold down exports, and I expect these external factors will continue to do so for some time. So, taken together, the available spending and production indicators suggest that the overall economy has been advancing at a moderate pace, with moderate growth in household spending offsetting weakness in other sectors.

But that's the past. What about the future? Looking forward, a key question is how much effect the fallout from global economic and financial developments since the turn of the year will have on economic activity. In some respects, the answer appears to be, "Surprisingly little." Although securities and commodity markets have experienced bouts of volatility and prices were down sharply for a time, conditions have calmed down recently and many asset prices have recovered. On net, equity valuations are down only a little since our December meeting, while oil prices and the dollar are essentially unchanged.

But in other respects, recent global developments have left their mark. In the Tealbook, the projected level of trade-weighted foreign GDP at the end of 2016 is now almost ½ percent below the staff's December forecast. Risk premiums here and abroad have risen notably on net in recent months, with the spread between the yield on triple-B corporate bonds and long-term Treasury yields up about 30 basis points. Analysts' earnings expectations have been marked down, in part reflecting weaker global sales prospects since December. By themselves, these developments have negative implications for the baseline outlook. But, in addition, the turbulence in recent months suggests that the risks to the outlook from developments abroad have increased.

At the time of the December meeting, last summer's market volatility could reasonably have been viewed as a one-time event that was behind us. But the developments of recent months, including the missteps of some foreign authorities in dealing with market stress, suggest that the global economy is more fragile than I'd previously thought. Reflecting these heightened risks, respondents to the dealer survey see a nontrivial probability, as Beth Anne's analysis also showed, that the global economy will fall into recession this year, and that the next FOMC move will be to lower, not to raise, rates.

Market participants have reacted to these developments by revising down their expectations for the future path of the funds rate considerably since our December meeting. As a result, longer-term Treasury yields and residential mortgage rates are down about 30 basis points over that period, while triple-B corporate yields are down a little less despite the widening of risk premiums.

That financial market participants would respond in this stabilizing manner was not guaranteed. If they had, instead, mistakenly believed that policy was on a more or less preset course of funds rate hikes this year, I think it's safe to presume that financial market conditions would now be considerably less favorable. Not only would long-term interest rates be higher, but equity valuations and oil prices would likely be lower, and the dollar would probably have appreciated further. The possibility that the market might have reacted in this way strikes me as quite real, in view of how many commentators viewed the December dot plot as a commitment to four hikes this year, a misinterpretation I hope we will all strive to correct whenever possible. Fortunately—and I'm joining a number of my colleagues here in interpreting things in this way—the market responses we have seen suggest that financial market participants do understand that our policy is data dependent, and, as a consequence, current financial conditions remain consistent, in my view, with the baseline outlook for real activity that is little changed.

As in December, I continue to anticipate that growth will be moderate and that labor market conditions will improve further, conditional on a path of increases in the funds rate over time that are now a bit more gradual than the path I anticipated in December. With respect to the balance of risks, however, in light of my concerns about the global economy, I now see the risk to real activity as tilted to the downside.

On inflation, I agree with the staff's judgment that the bump-up in inflation in January will probably prove to be an artifact of movements in a few volatile items that are unlikely to be repeated and seasonal adjustment issues. Accordingly, my baseline inflation forecast is little revised from December, as oil prices and the dollar are essentially unchanged. In particular, I continue to expect that inflation will remain low through the end of the year but then will move up in early 2017 once the transitory effects of previous declines in energy prices and dollar appreciation finally disappear.

Over the rest of next year and through 2018, I expect inflation to move back to 2 percent, aided by further labor market improvement. This unchanged outlook rests heavily on the continued stability of the true long-run inflation expectations that matter for wage and price setting over time. On this point, I found the analysis presented in the staff memo on this topic reasonably persuasive and so continue to assume in my baseline forecast that inflation expectations are reasonably well anchored. Nevertheless, my confidence in this assumption has fallen somewhat in recent months, because I cannot entirely dismiss the possibility that the declines in inflation compensation and some survey measures are signaling some slippage. So, like many of you, I now see the risks to the inflation outlook as also tilted slightly to the downside.

What does this mean for tomorrow's policy decision? For me, the case for leaving the target range unchanged for the moment seems clear. Reflecting my baseline outlook, my assessment of the risks, my view that the level of the neutral federal funds rate remains low, and some skepticism on my part that the headwinds holding down the neutral rate are apt to subside over the next few years as rapidly as in the Tealbook baseline, I see limited danger of falling "behind the curve." In addition, financial market participants do not expect any move at this meeting, and surprising them by unexpectedly tightening would likely be highly disruptive. Moreover, leaving policy unchanged at this meeting will give us more time to confirm that, despite unsettled global conditions and the drag arising from weaker foreign growth, the economy is continuing to expand at a moderate pace, accompanied by further job gains. I think such a cautious approach is prudent in light of our asymmetric ability to respond to shocks to the economy. While we can speed up the pace of tightening as needed, if conditions turn out to be unexpectedly strong, we have less ability to provide accommodation in case of a downturn because of the effective lower bound and costs associated with our unconventional policy tools.

To be clear, I do expect that further gradual increases in our target range will be appropriate if the labor market continues to improve, even if the risks pertaining to global conditions do not significantly subside. To remain on hold for too long as the labor market improves, assuming that inflation continues to evolve in line with our forecast, would risk inadvertently allowing the economy to become overly tight, although, as I mentioned, I don't think we've reached that point yet.

So let me stop there. Do we want to call it quits at this point or let Thomas—

MR. EVANS. We should leave something for tomorrow. [Laughter]

CHAIR YELLEN. Well, we have dinner across the street at 5:30, but it's not yet quite 5:30.

MR. WILLIAMS. We'll walk slowly. [Laughter]

CHAIR YELLEN. Okay. So let's have Thomas start tomorrow morning, and why don't we call it quits for the day. Thank you.

[Meeting recessed]

March 16 Session

CHAIR YELLEN. Okay, folks. Good morning, everybody. Let's get going. We do have data releases this morning, but David is waiting for a little bit more information to be available to him before he discusses those. So what we'd like to do is to start off with Thomas's briefing, and when David's ready, we'll interrupt the policy round and turn to David. Thomas.

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

Central to your policy decision at this meeting is your assessment of the implications of recent financial market volatility and of the current state of inflation expectations for the economic outlook. Alternatives A, B, and C present essentially the same modal outlook for economic activity and the labor market but different assessments of the outlook for inflation and of the risks attending the economic outlook, along with corresponding policy choices about adjustments in the federal funds rate today and at subsequent meetings.

On balance, the turbulence in financial markets earlier this year and continued low readings from various measures of inflation expectations appear to have left only a small imprint on the modal projections of private forecasters. Like you and the staff, they have marked down slightly their expectations for 2016 real GDP growth and inflation and, as shown in the top-left panel, have barely changed their outlook for 2017. Those forecasts also appear to build in an assumption of a somewhat lower level of short-term interest rates at the end of 2017, whereas market expectations for the federal funds rate path, shown in the upper right, have shifted more noticeably. Even though in recent weeks the current path has moved back up to where it was at the time of the January meeting, it remains substantially flatter than in December.

One possible way of interpreting the divergent messages from economists' forecasts and investors' policy expectations is that the modal economic outlook is associated with downside risks that, if realized, would lead to a shallower future path of the federal funds rate. The colored bars in the middle-left panel present averages across respondents to the primary dealer survey of the probabilities they assign to the level of the federal funds rate at the end of 2017 under two scenarios—one in which the federal funds rate returns to the lower bound at some point between 2016 and 2018, the blue bars, and one in which it does not, the tan bars. The black dashed line shows the probability distribution that results from assigning weights of ¼ and ¾, respectively, to the blue and the tan bars, ¼ being the probability assigned by the median dealer to returning to the lower bound during the next three years. When pricing derivatives contracts, modest shifts in the weights on these two scenarios could result in sizable shifts in the expected policy rate path. Moreover, some

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

investors might envision scenarios in which the federal funds rate returns to the effective lower bound persistently, explaining the sensitivity of the market-based path at horizons of four years or so.

Despite the recent improvement in market sentiment, it is not difficult to come up with a list of risks to the economic outlook. Indeed, market participants have been discussing vulnerabilities abroad, including those in China, Japan, and the euro area that were noted by Simon and Beth Anne yesterday. The striking co-movement observed over recent months among several classes of assets—notably, the price of oil, broad stock market indexes, and corporate bond spreads—could reflect changes in the perceived likelihood of protracted weakness in major economies that would result in policy rates being at their effective lower bounds for quite some time. For example, the middle-right panel shows that the correlation between oil and stock prices has been extraordinarily tight since late fall. As discussed in Monday's Board briefing on financial developments, in the recent period, neither demand- nor supply-driven declines in oil prices have been read by investors as conveying good news. The large and synchronized fluctuations in these asset prices may be related to the downward shift in perceptions of the neutral rate in many major economies implied by expected policy rate paths and attendant concerns about central banks running out of ammunition.

Another possible interpretation of recent market turbulence and associated shifts in the expected policy rate path is that investors simply overreacted to relatively inconsequential economic and financial developments earlier in the year, and that, as fear dissipated, asset prices retraced most of their earlier decline and market conditions may continue to improve. Thus, to the extent that investor psychology is still scarred by the recent financial crisis, or a deterioration in liquidity in some markets may have amplified the moves in asset prices, it is quite possible that risk aversion will recede and the expected policy rate path will, before too long, shift back to where it was in December or rise even higher. Under alternative B, the Committee would communicate that it is taking a wait-and-see position on assessing the risks to the economy posed by somewhat weaker economic growth abroad and whether financial market developments have led, on net, to a tightening in financial conditions that might constrain economic activity. Alternative C, by contrast, places less weight on the possibility that recent developments have heightened the downside risks to the economy and gives greater weight to the view that the outlook for real activity and the labor market is still solid.

Alternatively, the recent market volatility and lower paths for expected policy rates could reflect a more lasting reassessment of the underlying strength of the major economies and their vulnerability to adverse shocks. With a lower path for the neutral real rate and muted inflation, modest adverse shocks could be sufficient to pin policy rates for a long time at the effective lower bound. Moreover, greater pessimism about the ability of economies to escape the lower bound could become self-fulfilling. This sentiment might be more aligned with the view embedded in alternative A in which the Committee would put its policy adjustments on hold until it sees the risks as more closely balanced.

The memo you received regarding the staff's current assessment of the state of longer-term inflation expectations relates to a second issue you are confronting, which is whether these expectations have moved in ways that would alter either your baseline outlook for inflation or your risk assessment associated with that outlook. As discussed in that memo, although we see some evidence pointing toward modest slippage in longer-term inflation expectations, we cannot rule out with confidence either that inflation expectations have remained stable or that they have slipped more noticeably. The lower-left panel contrasts two views on the role of inflation expectations in explaining the roughly 100 basis point decline in far-forward inflation compensation since mid-2014. As shown by the blue portion of the left bar, the respondents to the Desk survey view a decline in inflation expectations as playing a noticeable role in investors' thinking; by contrast, the right bar shows that Board and Reserve Bank models attribute most of the decline to inflation risk premiums. The risk-neutral probability of inflation running below 1 percent, on average, over the next 10 years, derived from inflation caps and floors and shown to the right, is quite elevated. But the sheer size of this probability suggests sizable premiums for insuring against the risk of protracted low inflation, perhaps because investors have become more concerned that low-inflation scenarios would be associated with persistent economic weakness.

In light of the ambiguity of the evidence regarding longer-term inflation expectations, the draft alternatives offer various options for how to characterize the outlook for inflation and the risks to this outlook. Alternatives A and B acknowledge that inflation is likely to remain low in the near term due in part to the earlier decline in energy prices, while alternative C looks beyond the near term and focuses on the expectation that inflation will rise to 2 percent over the medium term. The alternatives also differ in the degree of concern they express about the downside risks to the inflation outlook. Alternatives B and C revert to language used before January, stating that "the Committee continues to monitor inflation developments closely." By contrast, alternative A expresses the judgment that inflation expectations have declined and that "the risks that inflation will fail to rise to 2 percent over the medium term have increased." It therefore announces that no further increase in the target range will occur "until inflation moves closer to 2 percent on a sustained basis and the risks to the economic outlook are more closely balanced."

Thank you, Madam Chair. This concludes my prepared remarks.

CHAIR YELLEN. The floor is open for questions for Thomas. President Lockhart.

MR. LOCKHART. Thank you, Madam Chair. Thomas, just a little mundane question. Do you have the latest probability the market is placing on April versus June? What's the latest on that?

MR. LAUBACH. So I believe April is close to 10 percent, whereas June is closer to 50, but I—

MR. POTTER. It's probably 60 percent as of this morning because of the CPI data, and one rate hike is now priced in fully by September.

CHAIR YELLEN. Other questions for Thomas? President Williams.

MR. WILLIAMS. Thank you, Madam Chair. I have a couple of questions for Thomas. One is on the primary dealer survey, the lower-left chart. So I'm going to repeat, I guess, a statement/question that I've made before on this. When I look at Simon Potter's memo from March 11 to research directors—which I'm allowed to read, apparently—it shows that the median projection of the primary dealers for inflation over the next few years has not changed since January.

So when you were asking primary dealers—that is, the chief economists at the primary dealers—for their own view, at least the median response is that the inflation expectations have not changed. So you're asking them to opine on why market participants have changed their views. I liken this to going to a restaurant that we like and reading Yelp reviews that people don't like it, and trying to figure out what it is that they think, and trying to come to conclusions, and then maybe divide it among the service, the food, and the prices. So, again, maybe that's more of a statement than a question, but I just want to be clear on this, that these are people who have not changed their views on inflation, but they are asked why the market pricing has changed.

MR. LAUBACH. They haven't changed their views on inflation nearly by as much as the persons whose views they are reporting on. That's correct. Well, actually, the primary dealer surveys have changed very little, I think, at the long horizon since mid-2014. Simon is better suited to speak in response to this question, but my understanding is that they are asked to report on the views that they hear from the people who are actually trading these securities.

MR. WILLIAMS. I understand.

MR. POTTER. We asked them, "If the change in your expectations is different from what you estimate is the change in market expectations over this period, please explain." And I looked to how they explained it, and that didn't help. [Laughter] They are basically as confused as everyone else. When we asked a different set of people in the Survey of Market Participants, we basically got exactly the same results.

VICE CHAIRMAN DUDLEY. Having done this years ago, I have a lot of sympathy with your view. When I saw this originally, I looked and I said, "Oh, so they don't really know what's going on, so we'll just put a third, a third, a third" was sort of my reaction, frankly. I can see absolutely where you're coming from, President Williams.

MR. WILLIAMS. I even asked myself, if we were to poll ourselves about market expectations, we would probably come up with something similar—so I guess that's my first comment. The second question is more substantive, and that is that the SEP rate path is actually quite a bit lower in March than it was in December. How do you view the market reaction to that? Do you think that this is going to get a lot of attention, and how do you think about that?

MR. LAUBACH. There is a question in the dealer survey asking them about their expectations—what the median dot will be—and they're expecting 25 basis points. So the 50 basis point shift in the median at the end of 2016 and 2017 will come as a surprise.

MR. POTTER. The median response to the question about how the median SEP dot will move is 25 basis points. If you read the detailed comments, they're all aware of how fragile the median can be, so they did understand that it's possible for one more person to move and to get 50 basis points.

MR. LAUBACH. And the mean of the end-2016 change is actually only 26 basis points. So the median in this instance exhibits that fragility to which Simon was referring.

MR. WILLIAMS. So your answer to the question—Do you think that markets will just see this as, kind of, what they expected, or do you think they'll see it as a softening of the Committee's views about the future policy rate path beyond what they were already expecting?

MR. LAUBACH. A fair bit seems to be expected.

MR. WILLIAMS. Thank you.

CHAIR YELLEN. President Bullard.

MR. BULLARD. Thank you, Madam Chair. I just wanted to follow up on President Williams's first question, and I appreciate his comments on this about inflation expectations and the interpretation. So if you look at something like the Survey of Professional Forecasters, they always say 2 percent, no matter what. Among those people, I'd interpret that to mean we have a lot of credibility. It's a general equilibrium, so if you believe the central bank is going to do the right thing to get back to the inflation target, then you just keep saying 2 percent, because you have full confidence in the central bank. But the market as a whole, I don't think, has that same level of confidence, and that's why those TIPS five-year, five-year-forwards move around, and so that's my interpretation—they represent credibility, and I don't want them to get too far out of line. Obviously, as I've said before, I'm a little bit suspicious of these decompositions into liquidity premiums and inflation. So I interpret them mostly as inflation expectations on the part of the market, and I interpret that as—if they're falling, it's waning credibility in either the ability or willingness of the Committee to keep inflation at its target.

CHAIR YELLEN. President Evans.

MR. EVANS. Thank you, Madam Chair. Just to pick up on this discussion here, I guess I'm a little confused. I always thought the value proposition for the New York Federal Reserve's Markets Group when they go out and talk to people in the market was—they were talking to people in the market. When Vice Chairman Dudley was in charge of that group and we had commentary, he would say that when he worked at Goldman, well, you were supposed to go talk to the people—you know, the traders and that type of thing. But some of the chief economists' forecasts come into play. If you tell me that all they're going to do is report back on forecasts like the Blue Chip or Survey of Professional Forecasters, then the value proposition goes way down for that type of intelligence activity. So I can't say I know exactly—Simon, you're looking puzzled at that.

MR. POTTER. We make sure we ask them much harder questions than the Blue Chip.

MR. EVANS. That's right, but the idea is basically that they've sort of heard, right? And we want to know what the people who are actually trading in the markets are thinking—so that's what I'm hoping to get out of this type of commentary.

MR. POTTER. I'd say that we focus a lot on what the median response is, and the distribution across types of market participants is really important, and there was some distribution across how you would decompose the drop in inflation compensation. You know, a lot of people don't understand it. Some of the answers that they gave as to why it might be different are reasonably smart, but it's not as if anyone's got a "secret sauce" they can give you that's different from the models, or from the lack of understanding that we have of what's happened.

MR. EVANS. Right. So you folks do analysis with that, too. So that's also part of the proposition. President Bullard mentioned the Survey of Professional Forecasters flatlining at 2 percent on their long-term inflation forecasts for the PCE, and I always interpret that as, well, they know what π^* is—we've said it's 2 percent, so the long-term PCE projection doesn't move. I think it's much more revealing when you look at the CPI longer term, and that one acts like we don't give them the answer in the back of the book, so the fact that that one is trailing down a little bit I find much more worrisome.

CHAIR YELLEN. Any other questions for Thomas? [No response] Okay. David, are you ready to talk about the data?

MR. WILCOX.[6] Absolutely. I'm as ready as I'm going to be. [Laughter] When I was in high school, I thought I might be a professional French horn player. And when you hadn't really spent enough time in the practice studio, you'd console yourself that you really didn't want to be overrehearsed when you got to your lesson. [Laughter] So this will test that proposition.

Let me start with the consumer price index and its implications for the PCE price index. You have a handout called "Material for Consumer Price Index Update." As you can see from the top lines in the table, on a rounded basis, the overall CPI came in close to our expectation, declining 0.2 percent in February. This is an area, though, in which basis points matter, and, on an unrounded basis, the decrease was 4 basis points less than what we had expected. So the actual decline, unrounded, was 17 basis points. We had expected a 21 basis point decline.

MR. DUDLEY. Off with your head. [Laughter]

MR. WILCOX. There you go. It only gets better—or worse, depending on your point of view—from here. Within the overall index, energy prices declined a little more than we had

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

expected. We'd looked for a very sharp decline of 5½ percent. They were down 6 percent. Food prices were one-tenth stronger than what we had expected.

The core CPI obviously is a piece that we focus on an awful lot—the bottom set of rows in the table. Those increased 0.3 percent, and, yes, it was a full 10 basis points stronger than we had been looking for. The biggest surprises look to have been in the core goods area, in which prices increased 0.3 percent, whereas we'd expected them to be flat. This is the second month in a row with core goods price surprises. Almost all of the miss this time was in apparel, which is quite a volatile component of the price index. Another piece of the surprise was in the CPI for medical prices, which the BEA does not pick up in constructing PCE prices. They use the PPI prices for medical care in putting together the PCE price index.

In terms of the implications for PCE prices, for top-line PCE inflation, we now estimate an increase of 0.4 percent for the first quarter. That's a quarterly figure at an annual rate. That is up from our forecast of an increase of 0.1 percent in the Tealbook.

For core PCE prices, we're now projecting a quarterly increase at an annual rate in the first quarter of 2.2 percent, which is up from 1.9 percent in the Tealbook. In the second quarter for core prices, at this point on a preliminary basis, we've nudged up our projection from 1.5 to 1.6. So we're still expecting basically the same contour, albeit following a slightly higher path than what we had in the Tealbook.

I don't yet have a full set of 12-month changes for you, but I do have February—that the 12-month change for top-line PCE prices is 1.0 rather than 0.9 as we had projected. So there is the one-tenth upward surprise in PCE prices. And for core, we now have that estimated at 1.8 percent, up from 1.7 in the Tealbook. The piece that I don't have for you is the 12-month changes for March, April, and so forth.

CHAIR YELLEN. That's for PCE prices?

MR. WILCOX. Those last two figures that I gave you are PCE prices—top line of 1.0, up from 0.9, and core PCE prices of 1.8, up from 1.7 in the Tealbook.

Now, let me turn briefly to our estimate of GDP growth in the first quarter. The figures that I'm going to report here will all be in terms of their contributions to growth of real GDP. And, in case there was any suspense, let me remove it. I reported yesterday that we'd revised our estimate of GDP growth to 1½ percent from 1.9. There have been a bunch of puts and takes since yesterday, but we're still at 1½.

As I reported yesterday, we revised down our estimate of the contribution to real GDP growth from PCE, which is one of the pieces that's informed by the retail sales release, and that took 0.4 percentage point out of our GDP estimate. Subsequent to my report yesterday, we've taken on board some additional information. Sales at building material and supply stores were a little stronger than what we had expected. That points to a little stronger growth in residential improvements, and those are part of residential construction.

In addition, we filtered some of the relevant components of the February PPI. Those were a little lower than what we had expected, so they imply marginally stronger growth in various categories of equipment investment and both residential and nonresidential construction. On the other hand, the higher prices in the CPI today imply yet weaker real growth of PCE, so that's going to take, on our estimates now, about one-tenth and a half or two-tenths out of GDP from the higher prices deflating the nominals that we learned about. All told, we're at 1½ percent for Q1 and 2 percent for Q2, and, for those who are really keeping track of the details, we're up one-tenth in Q4, from 1.2 to 1.3. So that's where we are.

MR. FISCHER. The last Q4?

MR. WILCOX. Yes. We're up one-tenth for the fourth quarter of last year, from 1.2 to 1.3. We're still at 1.5 for Q1, as was the case yesterday, but with a bunch of jiggling around. And we're still at 2.0 for Q2. In the details, what that 2.0 reflects is a little weaker real household spending due to the higher price inflation and marginally stronger residential investment from the higher single-family starts that were also reported this morning.

CHAIR YELLEN. Are there questions for David? Let me just note one thing—that in alternative B, as distributed in Thomas's handout, we did change one word in paragraph 1 describing household spending. We changed "solid" to "moderate," in light of the data that David described.

MR. WILLIAMS. I realize that, just from Q4 over Q4 for GDP growth, you gave a lot of numbers. I'm struggling to do this all in my head and get it right.

MR. WILCOX. For what year?

MR. WILLIAMS. For 2015 and 2016. I'm guessing 2015 doesn't change. But 2016?

MR. WILCOX. I'm guessing that 2015 doesn't change, because it's one-tenth on one quarter, so divide that by 4, and we'd still be at 1.9. And our estimate for 2016, I think, should be down one-tenth, to 2.1.

MR. WILLIAMS. Okay, that's what I thought. Thank you.

CHAIR YELLEN. Are there any other questions? [No response] Okay. Let's begin our policy go-round. President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. I support alternative B as written. While the real data have been about as I expected, problems with major trading partners and the volatility in financial markets make a tightening at this meeting premature. I view the global economy as still fragile, which is presumably the source of the volatility we have seen in financial markets. With many of our trading partners experiencing very low inflation rates and weak economies and, consequently, with regard to untried new monetary policy tools, a risk-management approach to monetary policy indicates that the benefits of waiting dominate the modest cost of not moving at this time.

However, my SEP forecast embeds the assumption that we will raise the federal funds rate three times this year. If wage and price data in the intermeeting period provide more evidence that PCE inflation is likely on its way toward 2 percent, and that labor markets are tightening further, I could imagine it would be appropriate to move as soon as April. I do not think the current statement sets up that possibility, so if inflation improves and labor markets tighten further, additional communication by the Chair might be necessary.

Of course, I could also imagine that problems abroad start to leave more traces in the financial and economic data after this meeting, and it would then be quite appropriate to wait longer before our next move. Thus, I am comfortable waiting at this meeting, but I do want to encourage the perception that each meeting is "live."

Not moving in January and March already indicates that we are responsive to data and potential risks to the economy. But many financial market assessments of future FOMC actions suggest that markets remain more pessimistic than many FOMC participants about both the strength of the U.S. economy and our likely path for raising rates. For the period ahead, we may need to enhance our communications to address this persistent gap in perceptions so as to avoid a significant disruption to markets at the time we choose next to move. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Mester.

MS. MESTER. Thank you, Madam Chair. On balance, the medium-run economic outlook has not changed materially since we made our previous SEP submissions in December.

The tightening in financial conditions we saw over January and early February has largely reversed. Oil prices and the dollar have shown some stability. Growth was weak in the fourth quarter of last year, but, on the basis of the data we have on the first quarter, it appears that growth is rebounding toward the 2 percent pace we've seen over much of the expansion. Throughout, labor markets have continued to show solid improvement, and the news on inflation over this intermeeting period has also been positive.

In my view, in light of actual and expected economic performance, it's appropriate for monetary policy to remain on a gradual upward trajectory this year. Admittedly, our data on the first quarter are limited. Because we have not prepared the public for it, a rate increase at this meeting would come as a surprise, which might induce volatility just when it looks like volatility has settled down. So I can see a reasonable argument that it's better to not make a change today and to continue to gather information and assess conditions. And I will support alternative B today.

But I'd like to point out that, while alternative B sounds like the less risky strategy, there are some risks to the strategy as well that we need to consider. First, there's always uncertainty out there, and the FOMC could always make the case that we should wait to act until we gather more information. But waiting until all of the data line up in the correct way means waiting too long. We risk having to move rates up more aggressively in the future, with negative effects on the economy. Forestalling rate increases for too long in light of financial market conditions may simply produce more volatility in the future if we find ourselves having to increase rates more aggressively than anticipated.

Second, it's very important that our lack of action today not be read as a negative message about the economy, which can be a self-fulfilling prophecy and would be inconsistent with our outlook. I believe that the proposed language in alternative B is much improved from the preliminary draft in that respect, although I think it will need to be followed up on in the press conference and in the Chair's other communications after this meeting.

Standing pat on rates today should not be read by the public as our having had a significant rethinking of the medium-term outlook or as indicating that we view the move in December as unjustified. I believe the message should be that we are data dependent, yes, but our best assessment at this time is that the economy will evolve in a way that will make gradual reductions in the degree of accommodation this year appropriate. The path may be a bit shallower than we thought in December because of the weaker growth seen at the end of last year and somewhat tighter financial conditions. But the economy has shown considerable resilience, and the outlook supports continuing on the path of normalization.

I would like us to be in a position to move rates up at any meeting this year should the data support it. And we need to recognize that our communications—in particular, the statement, minutes, and, importantly, communications from the Chair—play a critical part in getting us there. Indeed, had we better prepared the public for a move at this meeting, I would have advocated making such a move, on the basis of the economic outlook. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Lockhart.

MR. LOCKHART. Thank you, Madam Chair. I, too, support the policy action in alternative B and the statement as written. As noted in the economic go-round, I think the data to date this year are largely consistent with my December projections. But the first-quarter data are still relatively incomplete, and there is enough remaining ambiguity, especially as regards business fixed investment, to warrant some patience in moving ahead with the next adjustment of our policy rates. I am of the opinion that a rate move could be justified at the April meeting should the data continue to support the view that the economy is on a modestly above-potential growth track; labor markets remain robust, on the whole; and inflation signals continue to show some firming relative to our objective.

The language in alternative B today strikes me as consistent with keeping the April meeting live for a potential rate increase. However, whether the public perceives April as a "live" option will depend critically on our subsequent communications, including the Chair's comments following this meeting. I would be a little troubled by an alternative approach that, perhaps unintentionally, serves to reinforce the public's conclusion that April is absolutely off the table and the earliest possible normalization move is June. This seems to me a little awkward following a December liftoff decision that was accompanied by a median projection of four rate increases in 2016—of course, in the context of the now well-accepted caveat of being data dependent.

I don't think the data alone will demand a reappraisal of the path of the policy rate, so the interpretation could be that the Committee has shifted to a paradigm or changed to a reaction function that places more emphasis on global conditions, the policy stance of other central banks, financial market risk, and other exogenous factors that pose risks or work to tighten financial conditions in our markets. Effective communications may require an explanation that these factors are data, too, particularly if the baseline domestic economy readings continue to look fine.

Anyway, I think it would be appropriate to convey that the Committee is keeping its options open regarding April. If the data we receive between now and the April meeting are broadly affirming of what amounts to the Committee's base case, I think we should at least consider policy action.

As of now, it appears that the market participants and observers are placing, per the question I asked earlier, about a 10 percent probability on an April move. In part, this is due to an ongoing belief that this Committee will be reluctant to make policy adjustments at meetings without a scheduled press conference. I think this is a less-than-ideal situation. As I said, I believe that data-dependent criteria may well allow a rate adjustment in April. I won't go so far as to say the probability is 50–50, but, in my view, it's closer to even odds than it is to 10 percent. As a consequence, I think it's important to adopt communications that nudge the market to be more in line with the possibility that April is truly possible. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Madam Chair. I support alternative B as written. I'm confident we are moving toward reaching our full-employment objective, but I still believe there is additional slack that can be removed from the labor force. I feel better about the progress we're making on inflation, but I still would like to see more evidence of progress in reaching our 2 percent objective. And, as I mentioned yesterday, I would like to see more evidence of oil prices firming.

This all comes against a global backdrop that I view as challenging. Slowing global growth and overcapacity, high levels of debt to GDP in advanced economies, and aging populations in advanced economies—I think these issues all have the potential to affect financial conditions and make us susceptible to bouts of tightening, which could manifest themselves in the 10-year Treasury and a flight to quality, widening credit spreads, and a strengthening dollar.

As a result, I agree with the decision not to act at this meeting, and I think a slower, more gradual path may, over time, allow us to normalize more quickly.

In my comments after this meeting, I plan to avoid speculating on the timing of future rate moves. I plan to emphasize that we're keeping an open mind and are avoiding a predetermined path, and that we will base any action on our ongoing assessment of underlying economic conditions. I plan to emphasize that any removal of accommodation will be done only gradually, and that, at this juncture, the FOMC remains accommodative. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Powell.

MR. POWELL. Thank you, Madam Chair. I will support alternative B as written. The implied probabilities in the markets that Simon cited earlier—a very low probability of a move at the April meeting and about 50–50 or so at the June meeting—strike me as about right.

With a weak external environment and inflation running below target and likely to go sideways for at least a few quarters, I think that the Committee can afford to be patient. I'm open to moving in April, but I guess I don't see it as a likely outcome. I think it would be great to find a way to deviate from our pattern of only moving at the quarterly meetings associated with a press conference, but I'm afraid doing so now would inevitably send a note of urgency. I guess I don't see it as justified, and I see us as being able to be patient anyway.

The SEP median funds rate path is moving much closer to market forecasts, and I see that as healthy and appropriate. The sense that the Committee is likely to move more slowly than the December SEP suggested is probably one of the reasons why financial conditions have improved so much since February 11. My own forecast is now for two rate increases this year and three next year, which is not far from the SEP median.

I find it interesting that the SEP medians are moving decidedly away in this round from the Tealbook rate forecast and closer to markets. Now, of course, the Tealbook rate forecast is, by construction, a mechanical application of a particular Taylor rule without normative aspirations or intent. Although I'm broadly comfortable with the Tealbook's real economy forecast, I doubt that forecast would be achieved if rates actually followed the forecast path in the Tealbook. The forecast is for eight or nine rate increases in the next two years. And if you add in those rate increases plus a reversion of the term premium, the 10-year Treasury yield is forecast to be 3.6 percent at the end of 2017, and those readings all seem to be deep in the tails of market expectations, both in market readings and in surveys, and out of touch with the realities of the global economy. I don't really have an answer to suggest. I just will note that there seems to be a growing disconnect there.

To wrap up, weak global growth is likely to put a fairly low speed limit on our own growth and on the path of rate increases. It strikes me that the Committee faces a tradeoff between policy divergence and economic divergence. If our policy diverges too much from what the rest of the world is doing, we'll be unable to diverge meaningfully from the dismal state of global growth. Fortunately, I don't see this tradeoff as a difficult one for us in the near term. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Evans.

MR. EVANS. Thank you, Madam Chair. I support alternative B. My December SEP path assumed two funds rate increases later this year, and, after taking a hard look at my outlook, I found no compelling reason to change that assessment. A basic data-dependence calculation calls for holding steady today, in my opinion. Inflation is higher, but, as I discussed yesterday, we're also facing tighter financial conditions than we anticipated in December. In effect, financial markets have tightened for us. In addition, I continue to be concerned that inflation expectations have declined or, at the very least, are fragile.

The forces holding down inflation expectations are global, and I don't think it is so easy for us to depart from the rest of the world. To me, these developments at least offset what could prove to be a short-lived increase in core inflation, but, of course, monitoring the data developments remains important.

A risk-management approach also continues to argue for no change in rates today and a plan for only a couple of increases in 2016. First, we shouldn't overreact to the positive news on inflation. We've underrun 2 percent for quite a long time. Now we've seen high first-quarter readings on inflation. This could turn out to be transitory. There's very little cost in waiting a few months to get a better reading on the true underlying trends.

Second, on account of the modest pace of growth in our baseline forecast and the considerable uncertainty and downside risks emanating from international economic conditions, I believe that policy should provide strong support to aggregate demand as a buffer against future downside shocks. Our continued proximity to the effective lower bound leaves us little conventional ammunition to address such shocks, and, despite the excellent staff memos on policy alternatives we could use if the economy were to weaken, I would prefer to be extracautious this year to avoid having to resort to those contingencies.

Third, a very gradual path of rate increases helps counter the risk that inflation expectations could be lower. Any appropriately accommodative policy rate path should provide a strong signal of our commitment to a symmetric 2 percent inflation target. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Tarullo.

MR. TARULLO. Thank you, Madam Chair. I also favor alternative B as written. I think the impulse to allow some time to see if global volatility has actually calmed down may itself be a sufficient reason for maintaining the policy stance. For me, there's the additional, more basic motivation of a risk-management approach that counsels some—although, obviously, not heavy—bias against raising rates under current circumstances and does so for a few reasons. First, as people in and out of the Committee have mentioned frequently, there is the asymmetry of tools available to us to meet upside and downside risks. And, in that regard, I'd recall Beth Anne's discussion yesterday of the difficulties being encountered by the ECB and the BOJ in trying to implement unconventional policies.

Second, there is what I, at least, regard as the relatively low probability of inflation getting away from us if it proves to have a little bit more bounce than I currently expect. And here I think—not today, obviously, but over the coming months—I could probably use some help from those of you who keep referring to this possibility of inflation getting away from us, because I want to understand what the theory of that is under current circumstances. I know there are a couple of historical episodes that people point to, but, with my limited reading and understanding of those episodes, they seem to be characterized by things like the economy having run hot for a considerable period of time; a big fiscal stimulus in one instance coming into play; and being in an era in which central banks, including this one, had not worked as hard as they have more recently to establish the prevailing theory of anchored inflation expectations.

Now, I may have some doubts personally about what I still regard as sort of an undertheorized theory, but if you believe in the anchored expectations approach—and that seems to have animated a good majority of this Committee over the past five or six years—I do have some difficulty understanding how and why those same anchored inflation expectations would not keep inflation anchored during a period in which actual inflation was beginning to move up and thereby give us time to react. The reaction could be, by some measure, a little bit slow, but, again, if I understand the inflation expectations hypothesis correctly, it shouldn't get too far away from us during that period. And, presumably, as the Committee begins to react, the expectations would have been reinforced—"Oh, yes, they may be a little bit slow, but they're still committed to 2 percent over the medium term."

As I say, I would like to understand better what the current theory is for why things could get away from us. And I'll just note very briefly that there's a third reason for what people term the risk-management approach—the possibility that we're in a fundamentally different economic environment in which the major challenge is not inflation or stagflation but stubbornly low inflation and growth. This is sort of the secular-stagnation hypothesis and its variants. You don't need to believe that this is necessarily the case, but if there's something to it, we could be assessing things through eyes that were trained for and through very different experiences. But if these sorts of hypotheses prove to have limited or no salience, again, we should have time to react to actual changes in the economy.

As to the language, personally, as I noted yesterday, I think the risks are pretty clearly to the downside, but there are good institutional reasons, both positive and normative, for issuing a statement that doesn't come down too heavily in making that point or, indeed, in making any point substantially different from the ones we've been making over the past couple of statements. The positive reason is the obvious one that I probably couldn't garner a consensus for that view and inserting a stronger statement. But the normative reason, I think, is more powerful, and that's that I don't believe we should swing too much from meeting to meeting in what we're saying in the statements.

We need to take account of things that are happening, and that's what paragraph 1 allows us to do. It may shift a little bit what we're expecting, and that's what paragraph 2 allows us to do. But too much of a swing, particularly at periods in which we are not actually inclined to make a policy move, strikes me as risking our own credibility as markets begin to try to figure out "Where are they this month?" and "They just kind of veer all over the place." I would have felt that way even if things were still somewhat more volatile in markets, so long as the effect was not being significantly felt in the real economy.

I think alt-B does a very nice job of doing that, in that the important clause inserted in paragraph 1 makes the point that, notwithstanding the global developments of recent months, we've still been expanding at a moderate pace. And paragraph 2 notes that there are still some risks out there. So I think that actually does quite a good job of maintaining everyone's optionality right now. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Brainard.

MS. BRAINARD. Thank you, Madam Chair. Although financial markets have improved recently, the underlying drivers of the risk-off movements in markets last summer and at the start of this year remain largely unresolved. Global growth is very low. This low growth, together with concerns about foreign policymakers having limited additional space, increases the vulnerability of important economies to adverse shocks and makes it more difficult to correct financial imbalances. As a result, the chances that adverse events abroad will, through significant further dollar appreciation or financial turmoil, affect inflation and activity here at home are sobering. At the same time, the asymmetry in policy at the effective lower bound makes it more challenging to respond to such adverse shocks.

Of course, there are also risks on the other side. The strength in household demand and the labor market could be indicating that resource utilization will soon become very tight. This could push inflation persistently above our 2 percent target and put upward pressure on inflation expectations above 2 percent.

I've listened carefully to the discussion around this table, and I take these considerations very seriously. However, I believe we have much greater policy space using conventional tools to deal with this, and several considerations lead me to assess that the probability of such an outcome is somewhat lower than the alternative. First, as the most recent labor market report illustrated, supply in the labor market may be more responsive to improving labor market conditions than we previously thought.

Second, recent research has suggested that the slope of the Phillips curve is flatter now than it has been in previous decades. Moreover, recent data on inflation expectations suggest that the risks to inflation expectations are to the downside, not to the upside. In addition, these hints of lower inflation expectations have developed against a backdrop of sub–2 percent inflation for nearly every month of the past six years, together with weak and fragile global growth. It is difficult to imagine these circumstances reversing—with inflation persistently significantly above our target and worries about inflation expectations moving higher—any time soon. Indeed, I'm struck that the majority of FOMC participants see risks to headline and core PCE inflation as tilted to the downside, a noticeable shift compared with December.

Third, it's helpful to remember that the world is in a different place than it was in the decades prior to the financial crisis. In particular, the natural rate of interest both here and in much of the rest of the world is considerably lower, with many estimates suggesting a rate currently close to zero.

Finally, the backdrop of weak and decelerating global demand suggests that any unexpected strengthening here at home will be absorbed, at least in part, through some combination of further appreciation of the exchange rate and tightening of financial conditions.

To guard against the downside risks posed by the current environment, monetary policy should focus on carefully preserving and protecting the areas of strength in our economy. It should recognize the endogeneity of financial conditions to our expected policy rate path due to the fragility of the global economy. By doing so, we can increase the economy's resilience and make it less susceptible to adverse shocks, and, importantly, we'll also reduce the probability that we would confront the need to make further use of unconventional policies.

I think the language in alternative B strikes that careful balance. Although it notes that global economic and financial developments pose risks, it does not conclude that, therefore, overall risks are tilted to the downside. This careful evolution of the language, together with the SEP, should provide useful guidance on how the Committee is likely to adjust the policy rate path in response to the evolution of the data. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Harker.

MR. HARKER. Thank you, Madam Chair. As inflation remains below target, and that my economic forecast anticipates only a gradual increase in inflation, I support alternative B at this meeting. It is not crucial that we adjust policy today, but I believe it is important, in view of the underlying strength of the economy and the increasing likelihood that inflation will return to target in the not-too-distant future, that a move in April not be taken off the table at this point.

Labor markets continue to improve, and a recent FRBSF Economic Letter—"What's Up with Wage Growth?"—convincingly argues that nominal wage growth is much healthier than usually reported in the numbers that we look at. There's been a strong rebound in equity prices, and financial volatility has waned as well. Inflation has shown signs of firming as oil prices have bottomed and even risen a little bit of late and the dollar has stabilized. Thus, I am more confident in the economy than I was two months ago and less concerned about the potential for a sustained decrease in inflation or inflation deviating from target for a significant time to come.

Monetary policy remains accommodative, and we will still be accommodative in the event of future rate hikes. I think we need to remain, as we've all said, data dependent. And should the economy evolve somewhat in line with my forecast, a rate hike at the next meeting merits consideration. Signs of firming in inflation remain an important consideration for the setting of policy. But with inflation moving toward our objective and the economy at or above full employment, we risk sending confusing signals to the market if we delay normalization for too long. I worry that we are setting up an uncertainty feedback loop in which we consistently emphasize the risk that inflation will not return to target, and the markets reflect that concern, leading to volatility and lower inflation compensation, causing us to, again, pause normalization, which further worries the market. Thank you, Madam Chair.

CHAIR YELLEN. Governor Fischer.

MR. FISCHER. Thank you, Madam Chair. I support alt-B. I believe the federal funds rate should be placed on a very gradually rising path, which should, of course, be data dependent in the sense that every decision depends on economic developments and, primarily, on expectations of the effect of that and expected subsequent decisions on the economy.

At this time, after a period of serious market and economic turbulence from which the U.S. economy has largely but not totally recovered, we should pause for at least one more meeting in order to assess whether the ill winds of the first six weeks of 2016 have mostly abated, as now appears to be the case. By "ill winds," I mean mainly winds that have come from abroad, but also some that are domestic—for example, the apparent loosening of the long-term expected inflation anchor, on whose amazing stability we have long relied. As I mentioned yesterday, I believe we need to figure out how changes in the inflation anchor relate to the short-term expectations that matter for critical aspects of the inflationary process, including wage determination.

In yesterday's interesting go-round on the state of the economy, there was virtual unanimity that the global environment in which the U.S. economy operates has become more risky—mainly, but not entirely, in a downward direction. There was more confidence about the resilience of the U.S. economy, along with concerns about the potential unmooring of inflation expectations; the potential slowdown of domestic demand, which was reinforced by the data that came in at the beginning of yesterday's session; and the potential damage, in particular, that could be caused by foreign shocks.

In fact, each of us produced a list of potential problems in both foreign and domestic economies, replete with cautionary adjectives, to an extent that must have frightened all of us. In fact, it was enough to make one's hair curl. Certainly, my hair has curled, though I must admit that, when my wife explained to me it was the humidity that had done it, I countered that she had not been at the discussion, and that she needed to understand how frightening that was. What was lacking was an estimate of what the sum of all of the foreign risks amounted to, in terms of their potential effect on us, whether we move in April—as I would, at this stage, believe appropriate—or, rather, wait until June or even make no further moves this year. I understand from a conversation with the staff that the appreciation of the exchange rate since mid-2014 is estimated to have reduced GDP by 1 percent in total so far and is expected to reduce GDP by 1¼ percent in total by the end of next year.

Of course, there are other considerations that explicitly or implicitly affect our decision. First, it's hard to pull the trigger. Among the 320 million or so Americans are several million, a number of them columnists, who know much better than we do what decisions we should make. [Laughter] So we will be criticized no matter what decisions we make. That's the price we pay for having accepted the responsibilities of making the critical decisions we face eight times each year. Concern over making a mistake may sometimes point to the value of waiting for more information. But prudence requires us to make the right decisions at the right times on the basis of the information available.

Second, and most important, is the credibility of the Federal Reserve. I believe we gained credibility by the Chair's calmness during the recent turbulence, and the expected continuation of that calmness will contribute even more to our credibility. But, of course, what ultimately gives an individual or an institution credibility is the quality of its decisions, and I believe we're making the right decision today. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Bullard.

MR. BULLARD. Thank you, Madam Chair. I support alternative B for today as written. I think there is a good case for moving today on the basis of the Committee's outlook as of December. We basically have very good labor market reports, we arguably have an upside surprise on core inflation measures, and the global economy is arguably expected to grow more rapidly in 2016 than it did in 2015.

Nevertheless, I'm advocating that we wait at this juncture because I would like more reassurance that market-based inflation expectations will return to more satisfactory levels. My judgment is partially based on my reading of the euro-area experience over the past several years. My view is that our European colleagues reacted slowly to declining inflation expectations in Europe. They did eventually move aggressively, but it's a very long road back for them. In January 2012, 10-year nominal government bonds in the United States, the United Kingdom, and Germany had very similar yields, with Japan and Switzerland about 150 basis points lower. You could interpret that as differences in inflation expectations in the two sets of countries, with a real interest rate that is equalized across economies. Today Germany has joined the lower group, and the United States and the United Kingdom remain in the higher group. I would prefer that we not join the lower group.

I also think that, ultimately, we got a more substantial impact on the basis of the December rate hike than I anticipated at the time when we made that move. At the time, I interpreted our move as a small action with a lot of language meant to emphasize data dependence. My judgment today is that the market interpretation was very different. The market took the view that the December move set in motion a train of calendar-based moves. This is not entirely unwarranted on the market's part—because this is how the Committee actually behaved from 2004 to 2006, when we made 17 straight moves of 25 basis points per meeting. The combination of moving off zero and the median of the dot plot seemed to suggest a fixed path of rates regardless of the data. And, early in the year, as the data came in negative, that seemed to add up to recession probabilities for the United States, according to market participants.

To me, this experience calls into question the value of the policy rate portion of the SEP. One of the problems with the policy rate portion of the SEP is that we have in the past tried to use that as a tool to commit to the path of interest rates. So during the time we were at zero, we wanted to encourage markets to look at the zero rates out into the future as a commitment that we would be sufficiently accommodative to match the state of the economy. We are now trying to say that the path of rates suggested in the SEP is not a commitment but is merely a reflection of our judgment of the future evolution of the economy. I think that this is causing confusion, and our experience over the December/January/February period has made me worry more about it.

There was a time when we did not give such explicit forward guidance about how we were going to operate in the future, and a lot of that period—in the 1980s, 1990s, and 2000s—was considered very successful. Part of the reason it might have been successful is, we did not have this possibly misinterpreted future path of the policy rate sitting out there.

I'm not under any illusions that we would do anything about this immediately, and I think it would help the Committee to put the confidence bands around the policy rate and the other elements of the SEP that we discussed previously and, I think, are going to discuss again. But we should think more carefully about the wisdom of giving policy guidance through the SEP if we do not intend it to be some kind of commitment in the future. Now, we have a lot of language that says everything is data dependent, but I guess my experience over December/January was that we don't have a lot of credibility on that particular language.

Today's decision will indeed demonstrate some data dependence but in a somewhat awkward way, since intermeeting jobs reports were strong and inflation seems to be conforming more or less exactly with Committee projections. So we're likely to create with the decision today, even though I support it, a somewhat more confused picture about what the Committee's policy reaction function actually is.

If the Committee's policy reaction function does not simply depend on our mandated inflation and employment variables, why not put the other variables in the SEP? If we're going to cite global GDP growth, then why not have Committee members forecasting global GDP growth and seeing what their outlook is, and we can see how that changes from meeting to meeting? If it's risk associated with the global outlook, let's put risk in there, and then people can see how that's evolving over time and how that's feeding into our policy decisionmaking.

I think what we have is that these kinds of objects are supposed to feed back to employment and inflation outcomes, but what we're saying today is that, even though those outcomes were relatively good during the intermeeting period and are basically on track, we're still not going to move today. Also, I'm citing inflation expectations—those also aren't in the SEP. If I really thought I needed inflation expectations to get to some particular level, then maybe that should be in there as well.

The Committee is, in my view, today taking a calculated risk and possibly getting "behind the curve" later this year. I guess one thing I'd remind the Committee of is, we've moved only once, so it's not like we've had a sequence of moves. We've made only a single move of 25 basis points. We did lay out a path of what we're going to do, and it could easily get derailed in the first half of the year. Inflation could continue to go up.

I don't think this risk is particularly high right now, but it's becoming palpable. A larger risk may be that the signal being sent is that the Committee is growing very pessimistic concerning U.S. macroeconomic prospects. I think such a signal would be unwarranted, and that should not be the main message of the FOMC in this situation. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President George.

MS. GEORGE. Thank you, Madam Chair. I support the language in alternative B for paragraphs 1 and 2, but I do not agree with its policy prescription. Since the December meeting, incoming data have largely confirmed my outlook. We've received three strong labor reports as well as data indicating that inflation is moving higher. Unfortunately, our initiation of removing accommodation has coincided with what appears to me a more vulnerable global economy and a domestic economy that is threatened by markets that seem to be anxious, uncertain, and volatile. Faced with these dynamics, I recognize that the Committee's decisions to continue to normalize its policy settings become far more difficult.

Risks associated with financial volatility and global concerns have diminished recently, but I would agree with others that there have been no fundamental changes that would preclude more bouts of volatility in the days and even months ahead. So, in the face of such headwinds and uncertainty, I'm inclined to focus on our longer-run objectives. With an unemployment rate of 4.9 percent, the economy is near full employment, and the recent upward movements in year-over-year headline PCE inflation and core PCE inflation suggest that the temporary downward pressures associated with falling oil prices and appreciation of the dollar have been dissipating. In the interest of our mandate to promote long-run sustainable growth with healthy employment and price stability, I believe monetary policy should respond to these developments by slowly removing accommodation.

The Committee has acknowledged that the pace of policy adjustments is expected to be more gradual than would be dictated based solely on economic conditions as prescribed by policy rules. Likewise, a gradual path does offer a risk-management approach as we face various headwinds and risk in the economy. As described in Tealbook B, the real equilibrium interest rate and policy rules continue to point to settings that are, and will continue to be for some time, very accommodative under the baseline assumption regarding the federal funds rate path. The current federal funds rate is more than 2 percentage points below the Tealbook-consistent measure of r^*, and the only time since 2005 that this gap was larger was immediately prior to the December liftoff.

Postponing the removal of accommodation in the wake of improving economic conditions could very well promote risk that would decrease the likelihood of achieving our longer-run objectives. As we near full employment and price stability, continuation of the current level of accommodation invites further misallocation of capital and labor resources to sectors that are most interest sensitive.

My District is experiencing the fallout of a commodity price boom, and concerns are being raised nationwide regarding risk associated with commercial real estate lending. My concern for some time has been that extending monetary policy too far beyond its scope of capability risks undesirable financial, economic, and political distortions.

Waiting may seem costless in the face of benign inflation pressures, and confidence is often expressed that we'll have the ability to make the necessary or steeper adjustments later. This argument might be more persuasive if one was confident that the relationship between employment and inflation was reasonably positive. But most estimates suggest that the Phillips curve is pretty flat. Under this scenario, the challenges of speeding up inflation now, when it is below target, must be equivalent to future challenges of slowing inflation down, should it move above. With an output gap that is basically closed, I see costs associated with trying to fine-tune inflation dynamics when the transmission mechanism from unemployment to inflation is relatively weak.

So staying the course with a gradual path of policy normalization is warranted, in my view. A 25 basis point increase at this meeting is consistent with the economy's fundamentals, keeps policy very accommodative, and does not preclude pausing or responding if downside risks, in fact, materialize. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Williams.

MR. WILLIAMS. Thank you, Madam Chair. First of all, I'd like to say that my views align very much with President Mester's. So everything I add to that will probably be less coherent. But I think she captured my sentiments very much as well.

The baseline outlook is little changed, in my view, from the time of the December meeting. A wide range of labor market indicators—the unemployment rate, U-6, quits, and vacancies—have continued to improve and are at levels consistent with maximum employment. Survey data on the ease of either finding or filling jobs also point to fairly tight labor markets.

Although we continue to fall short on our inflation goal, the recent news on that front has been encouraging. Incoming data show some firming of underlying inflation. Oil and other commodity prices have begun to recover. The dollar has stabilized, and the continued strength of the labor market should help propel a more rapid pace of price and wage gains.

Now, risks to the outlook appear roughly balanced, to my mind. The resilience of the economy in the face of foreign headwinds to date has been notable. I mentioned this yesterday. We saw a big drag to net exports the last couple of years with the strengthening of the dollar and the decline in the oil prices. All of those shocks started occurring in 2014 and had their full effects in 2015. Yet the economy continued to grow, adding over 2.7 million jobs last year. And we've seen, as people commented on, a stabilizing, I think, of underlying inflation and are now seeing some signs of a firming of inflation despite the fact that we actually got hit by the big shocks. Moreover, domestically, there are upside risks to consumer and housing expenditure, and fiscal policy is set to be more accommodative over the near term.

Given that these conditions are consistent with my December modal forecast, I persevere in believing that, in the modal outlook, four 25 basis point increases in the federal funds rate will be appropriate this year. In this regard, I found the text of the case for alternative C in Tealbook B compelling. I thought it was very well written in terms of the description of the issues.

I should say that I think, at least in my interpretation—I'm kind of struggling with this a bit—the difference in my view about the policy rate path really isn't about the baseline outlook or the modal outlook. It's really about how to evaluate the risks to the outlook and the implications of those risks for the outlook regarding appropriate policy. So I actually don't think that my views are that different in terms of the modal outlook than those of the median voter, or at least the median participant, of the FOMC. It's really about, how to best take into account the risk-management aspects that Governor Tarullo, President Evans, and others have highlighted—what these risks really look like and what they mean for the economy and our ability to adjust policy in response to those risks.

I do think there's a bit of a bimodal distribution out there in the markets—and, perhaps, in our own views—where the main positive, outlook is actually one of continued solid growth, continued job gains, continued movement of inflation toward 2 percent, and all of that. In that modal outlook, I think four rate increases actually are completely consistent. I disagree a little bit with what Governor Powell was saying. I think that, if that outlook eventuates—if we add over 2 million jobs this year and if unemployment gets down toward 4½ percent—three or four funds rate increases this year and movements of the 10-year Treasuries and things wouldn't be that surprising to markets. It would be seen as a sign of strength. So I think there's a consistency in the modal outlook. I think the real issue, again, is how to incorporate the information about this negative scenario in terms of both what's appropriate policy in the baseline and how we'd react to that. So that's just explaining my own thinking in terms of the modal outlook.

Now, I am becoming increasingly concerned that we are falling further "behind the curve" on this modal outlook. Nonetheless, I do support alternative B as written today. I'd repeat pretty much what everybody has said. The language of alt-B, I think, is a good balance. I agree with Governor Brainard's way of describing that. I think this is a good place to be at this time, and one of the reasons I come to that conclusion, despite my somewhat hawkish view of where the economy is going or where policy should be, is that in our statements in December and January, we emphasized that "the Committee will carefully monitor actual and expected progress toward its inflation goal." That's a commitment we made as a Committee, and I signed on to that last December and in January. So I think that does make a strong case for not moving in March—to collect some more data and make sure that we have a stronger conviction regarding the data both on the outlook for employment and, especially, on inflation.

To my mind, not moving in March is completely consistent with my view that we will need to raise rates on a steady path over the next couple of years. So I view, basically, the decision we're making today as completely consistent with our previous commitments to be data dependent and to assess both actual and expected progress toward our goal.

Now, in terms of looking forward, I think we've successfully convinced the markets that we're not on some preordained path. And the SEP, when it comes out, will show people that whoever thought we were going to have four increases this year—which I think was nobody—clearly, we've changed our view on that, reflecting especially the issues regarding the risks to the outlook. So I think that alternative B is very good. It keeps our options open to gather more data and basically honor the commitment we made in our statement to both assess and monitor actual and expected progress toward our goals. And I hope the data will verify that what we've seen lately with the stronger numbers persists and continues, and then we can make our future decisions based on that. My own view is that, if the data do come in as I expect, in future meetings we will have that flexibility to respond as appropriate to normalize policy in a timely manner.

Going 13th has the advantage of allowing me to respond to other people's comments, so I've done that a little bit. But I'd like to respond to President Bullard's comments about the dot plots. I don't agree that the dot plots were a commitment for a specific path of policy. I think they never were described that way, nor have they been interpreted that way. And the dot plots have changed over time. We've been doing this for years. You can see the dots changing as the data evolve and as the outlook evolves. When Glenn Rudebusch and I wrote a paper over eight years ago basically kind of making the case for interest rate projections, the whole idea really was not that the dot plots were giving you some commitment or some promise to do something. It was laying out your thinking about this, and, as the data evolved and as the outlook and the risks to the outlook changed, the projections would change over time and provide information about how the expected policy rate path changes as data, economic conditions, and the outlook change.

Now, when we were at the effective lower bound for years and years, we didn't really see that reaction function showing itself, because we weren't doing anything. But now we actually are showing the changes in our dots as the information changes, and I think this is a very helpful tool to give people information about our reaction function. If our reaction function includes risks to the outlook and risk-management concerns, that's hard to explain. I agree with President Bullard that it's not in our SEP. But this is something the Chair and the minutes and our SEP assessments of risks will explain. And, insofar as the Committee is deciding to make policy decisions on the basis of the risks to the outlook, we should communicate that, and I think this is what's going to come out of the March SEP—that the risks to the outlook are a factor in people's decisions.

The last bit of good news I'll mention—and this is something that I showed at the Monetary Policy Forum—is that if you looked at the bond market responsiveness to macro news, on the basis of this work that Eric Swanson and I did years ago, you saw that go way down when we were at the effective lower bound and were expected to stay there for two years or so. Basically, the markets were sitting there saying, "Two-year yields and one-year yields aren't moving in response to macro news," because everybody knew that a little bit of good employment data or a weak CPI wasn't fundamentally going to change the planned path of the policy rate for the next couple of years, as we were so deep underwater, if you will, on the zero bound.

But today, as we move to being just slightly above the lower bound, we've seen the market reactions—in terms of the bond rates, in terms of options pricing—move partially. On a one-year yield, it's responding about three-quarters as much as normal—as it did back in the 1990s—and on two-year yields, about half as much as normal. So I'm starting to see that muscle memory coming back to markets. I was just asking Simon here, you get a strong CPI, sure, market expectations of interest rates are going to go up a little bit. Yields are going to move around. This is a pattern we're seeing. This is a healthy development. I don't think we have the problems that President Bullard was concerned about, that somehow our dot plots or our other communications are confusing markets.

I think what's happening is that markets, now that we've moved away from the effective lower bound—and expectations are that we will move very slowly further away from it—are starting to react more as we want them to do. And the saying that we've always used as monetary economists is, “Let the markets do the work”—when there’s good news, yields move up, and when there’s bad news, yields move down. So I actually feel much more positive about how our communication is working and about how the markets are reacting to interpreting news in terms of our reaction function. We still have some way to go, because we’re still pretty close to the bound—we have a lot of risks that can push us back to the effective lower bound, but I guess my own view is that we’re halfway there in getting back to more-normal market functioning associated with our rate expectations. I think the dot plots could be helpful in that regard.

That’s it. So I said I support alternative B, right? Did I give that out? [Laughter] Thank you.

CHAIR YELLEN. I heard that, yes. President Bullard’s got a two hander.

MR. BULLARD. Yes, if I could just respond a little bit. I agreed with much of what President Williams said. I do want to remind the Committee that we did actually have calendar guidance at one point. Then the dot plots were conforming with that guidance, and we were saying this is a commitment that we’re not going to do anything until some amount of time passes. So I think to be able to transition from that kind of thinking about the dot plots to now saying, “This is no commitment out there”—that was very difficult, especially with regard to the first rate increase, and I did not appreciate how hard that was going to be. And I think you’re right, muscle memory will probably come back to markets, and everything might be fine eventually. But I think, right around this time of liftoff, I didn’t appreciate how much of an issue that might be.

CHAIR YELLEN. Okay. President Lacker.

MR. LACKER. Let me start with a two-handed intervention. [Laughter]

CHAIR YELLEN. All right.

MR. LACKER. If you look at the language we used when we were at the zero bound, we were extremely careful not to call it a commitment. We were extremely careful to say we were predicting what we would want to do in the future. So to say we talked about it as a commitment is a bit of revisionist history. Now, was it interpreted that way? I think so, because we argued that this was useful for achieving our objectives. So I think people read that as, the expectation that we would do that would be useful for our objectives, and therefore we wanted people to believe we would behave that way. That's a little bit different from actually articulating a commitment, which I don't think we did, but there's a little subtlety here.

MR. BULLARD. Well, I would dispute that it's revisionist history. You had a theory out there, due to Woodford, that says, "This is exactly what you should do when you're at the zero bound. You should commit to be at the zero bound longer." And we talked about that.

MR. LACKER. Yes, but that's not how we wrote it.

CHAIR YELLEN. We never endorsed that.

MR. LACKER. Yes.

CHAIR YELLEN. I don't think anyone on the Committee endorsed that.

MR. BULLARD. But that was one of the things we talked about.

MR. LACKER. My one-hander. [Laughter]

CHAIR YELLEN. The floor is yours.

MR. LACKER. Thank you very much. In considering the appropriate level for the funds rate target, I always think it's beneficial to keep our eye on some relevant benchmarks. And the four Taylor rules in Tealbook B are alternative ways of encapsulating our past behavior. I think they're a useful reference to the extent that that behavior has served us well in the past. In

December, those rules all recommended a higher funds rate, and we raised rates with the anticipation of several further rate increases this year to lower the gap between the recommendation of those rules and where we were. In January, we faced increased uncertainty in financial markets, and those Taylor rules uniformly prescribed lower rates than they had in December. We paused and issued a statement signaling our concern.

Now, however, the adverse financial market developments we saw in the first two months of the year have largely been reversed. Moreover, the turmoil has left little discernible trace on real economic data, which have largely confirmed our December outlook that there would be solid growth, and I think that's pretty much a consensus around the table here. Inflation has moved back pretty smartly toward our objective as well.

Each of the policy rules in the Tealbook now prescribes a higher rate for 2016:Q2 than it had in December, and each rule now prescribes a higher level for the funds rate—some considerably higher—than our current target. Now, I would not ever advocate slavishly following any of these rules. But, together, they capture important elements of our past behavior. That past behavior has generally served us well, so it's hard to think of another pattern of behavior that would be a better benchmark.

The gaps between, on the one hand, the Taylor (1993) and Taylor (1999) rules and, on the other hand, the actual funds rate have grown considerably since a couple of years ago, when they both finally recommended a rate increase. So it should be clear that we need to be raising rates over the course of the year, and I didn't hear much disagreement with that.

I recognize that a case can be made to adjust the intercept in such rules using the estimates of a time-varying r^*. Such adjustments would fall well short of eliminating cause for concern, however. Current estimates of r^* are at or above zero, as opposed to the 1¼ percent assumed in the Tealbook Taylor rule calculations. The current real federal funds rate is below negative 1, so a sizable gap still remains.

The fact that we've been falling further behind these benchmarks leads me to think that staying put today is a risky strategy. You've been articulate in public, Madam Chair, regarding the risk of waiting too long to remove accommodation. Inflation prospects can shift rapidly, and policy takes time to work. While financial developments should always be taken seriously, the staff has noted several instances in which financial market indicators have signaled adverse developments that never materialized.

When we have waited too long in the past, it has often been in response to financial market developments that turned out, in hindsight, to be false signals. Now that there's overwhelming evidence that the recent surge in financial market volatility is waning, I believe we should get on with the adjustments in the stance of monetary policy that we know we need to make over time.

Many of you argued that, while financial markets may have calmed down, concerns linger nonetheless, and that the prudent choice would be to maintain the current funds rate target. In view of the acknowledged need to remove accommodation over the course of the next several quarters and the risks associated with delaying that process, I'd argue that the prudent approach would be to stay the course and continue to raise rates at a gradual pace, including at today's meeting.

Accordingly, I favor alternative C. Yes, this might surprise market participants, but we could have—and I believe we should have—prepared markets for this choice. Keep in mind the instances in the past few years in which an announcement of new monetary stimulus seemed to be taken as a dark signal from us about the outlook. Raising rates today would be a sign of our confidence in the real economic prospects for our economy.

Should we adopt alternative B, which seems pretty likely, the silver lining for me is that it leaves the door open to an April increase. And I hope we convey that publicly, both at the press conference today and elsewhere. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kashkari.

MR. KASHKARI. Thank you, Madam Chair. I support alternative B. I see four reasons why we should take a gradual approach to normalizing rates. The first reason is inflation. Notwithstanding today's data, inflation is pretty consistently coming up short, and inflation expectations appear to be weakening. Second, as we discussed yesterday, the improvement in labor force participation is welcome progress in putting people back to work. I think we should let that process continue so long as inflation is coming up short. Third, the outlook for the global economy continues to be quite uncertain, especially outside the United States. Finally, global policy divergence could pose increasing drag on the U.S. economy and on our own inflation if the dollar continues to appreciate.

My last comment is, I'd like to thank the staff for their work on potential tools for providing additional policy accommodation. I found that analysis very helpful. I think it's useful not only in case of another downturn, but also in case we are really entering an environment of low interest rates. I would note that I found the options presented not that powerful, with a lot of risks and costs potentially associated with them. So I would encourage us to continue to consider a wide range of options in case we need them in the future. Thank you.

CHAIR YELLEN. Thank you. Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you, Madam Chair. I support alternative B. My reading of the statement language is that it neither pre-commits us to a move at the April or June meeting nor rules it out. I think the statement is appropriately balanced. On the one hand, it reaffirms our evaluation of the economic outlook in paragraph 1—that we're still on course—while, on the other, acknowledges the fact that global economic and financial developments continue to pose risks.

I suppose that the acknowledgment that there are such risks might be considered new information relative to the January statement. However, I think this was strongly implied by the January statement's language that we were assessing the implications for the balance of the risks. I don't think market participants will interpret the language as indicating a greater level of concern than we had in January.

As I see it, the risk-management considerations strongly support a decision not to tighten at this meeting. There are downside risks, to both growth and inflation, posed by global economic and financial market developments. Not to take these into consideration when the economy is growing only slightly above its trend rate and inflation remains below our objectives would be inappropriate, in my view. That said, it would not surprise me if those risks subsided in coming months. In particular, China seems to be doing a better job in communicating its currency regime and has been supporting economic activity through fiscal and monetary policy. And commodity prices may finally be starting to stabilize and, in some cases, recover. Oil prices are off the bottom, and other commodities, such as iron ore, have shown strong price recoveries recently. Brexit probably won't happen, so that uncertainty will likely be resolved in a favorable way with respect to the global economic outlook.

If the foreign situation improves and the U.S. recovery remains on track, then I think that would set us up well for a tightening at a future meeting, presumably the June meeting. As I noted yesterday, I would be reluctant to move as quickly as April, barring some unusual surprise in the U.S. data that alters the outlook in a material way. I'd like to think that April is on the table, but the reality is, to move at a non–press conference meeting would signal a sense of urgency to that tightening that I think would be difficult to justify, in view of the relatively sluggish pace of economic growth and the low level of inflation. But, of course, we'll have to wait for the data.

Finally, I have a few thoughts on the issue of negative interest rates in the United States. I'm getting a lot of questions about this whenever I speak, and I know a lot of other people are, too. I think that we should try to tamp down those expectations when we get those questions. Speculation and time spent on this question, I think, just reinforces pessimism about the outlook. For example, the risk of U.S. recession may lead to concerns about bank profitability and may lead to concerns that we're running out of ammunition. So I don't really see what's gained by feeding this speculation.

How would I tamp down such speculation? Well, I would emphasize several things. First, the U.S. economy is doing reasonably well. We are making progress with respect to our dual-mandate objectives. In other words, why are you asking me this question? Most of the significant risks lie abroad, not here in the United States—and this is really important—in contrast to the financial crisis. So discussion about negative rates for the United States, at least, is at best extraordinarily premature.

Second, if the economy were to weaken, we have plenty of tools to respond. We're not close to being out of ammunition. We could cut our target for the federal funds rate, lengthen the duration of our portfolio, do more QE, and use forward guidance, all of which are options that I think most of us see as dominating negative interest rates.

Third, given the structure of U.S. money markets and the recent experience of Europe and Japan, it's not obvious that we would ever turn to negative rates, even *in extremis*, because the costs might simply outweigh the benefits. I would remind people that when we looked at this a few years ago, when we were much further away from our objectives, we declined to push the federal funds rate into negative territory, and I think people should draw some inference from that. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Okay. Well, I think we've had a good round of discussion on the policy issues we face. I have heard your comments around the table about the importance of my own communications and will try to take it to heart. In particular, let me assure you that I do intend to be positive on the U.S. economy, to emphasize the resilience of the economy in the face of shocks, and to convey a sense of confidence that I think the outlook is favorable.

I will also try to keep all future meetings on the table but recognize that market expectations are not aligned with an April move. And, in the coming weeks, if it looks like that's something that's appropriate, there would remain a challenge there that perhaps I'd have to address.

So, with those comments, I have heard considerable support for alternative B, as worded. Brian, let me ask you to put forward what we should vote on.

MR. MADIGAN. Thank you, Madam Chair. This vote will be on the policy statement for alternative B on pages 6 and 7 of Thomas's briefing materials, and it will also be on the directive to the Desk that is included on page 10 of those materials.

Chair Yellen	Yes
Vice Chairman Dudley	Yes
Governor Brainard	Yes
President Bullard	Yes
Governor Fischer	Yes
President George	No
President Mester	Yes
Governor Powell	Yes
President Rosengren	Yes
Governor Tarullo	Yes

VICE CHAIRMAN DUDLEY. Madam Chair, may I say one final thing?

CHAIR YELLEN. Yes.

VICE CHAIRMAN DUDLEY. I think we owe a lot of thanks to the Chair and the staff for working on the statement. This is the first time I can remember that the statement went through a lot of iterations, and we actually ended up with a statement for which, as far as I can tell, not one person suggested a change in language. So kudos to the staff and the Chair, who worked a lot on this. That was not an easy needle to thread, so, well done.

CHAIR YELLEN. Thank you. So, just a couple of final comments. The date of our next meeting is April 26 and 27. You might want to come to that meeting dressed to the nines, because our photographer will be taking pictures of us for future use. Let's see—I think boxed lunches are now available, if you'd like them. And there will be a setup in the Special Library for those of you who are staying around and have late planes to catch, if you want to watch me be grilled by the press at 2:30. As usual, I will do my best. Thank you, all.

END OF MEETING