

**Meeting of the Federal Open Market Committee on
June 12–13, 2018**

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, June 12, 2018, at 1:00 p.m. and continued on Wednesday, June 13, 2018, at 9:00 a.m.

PRESENT:

Jerome H. Powell, Chairman
William C. Dudley, Vice Chairman
Thomas I. Barkin
Raphael W. Bostic
Lael Brainard
Loretta J. Mester
Randal K. Quarles
John C. Williams

James Bullard, Charles L. Evans, Esther L. George, Eric Rosengren, and Michael Strine,¹
Alternate Members of the Federal Open Market Committee

Patrick Harker, Robert S. Kaplan, and Neel Kashkari, Presidents of the Federal Reserve
Banks of Philadelphia, Dallas, and Minneapolis, respectively

James A. Clouse, Secretary
Matthew M. Luecke, Deputy Secretary
David W. Skidmore, Assistant Secretary
Michelle A. Smith, Assistant Secretary
Mark E. Van Der Weide, General Counsel
Michael Held, Deputy General Counsel
Steven B. Kamin, Economist
Thomas Laubach, Economist
David W. Wilcox, Economist

David Altig, Kartik B. Athreya, Thomas A. Connors, David E. Lebow, Trevor A. Reeve,
Ellis W. Tallman, William Wascher,¹ and Beth Anne Wilson, Associate Economists

Simon Potter, Manager, System Open Market Account

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

Ann E. Misback, Secretary, Office of the Secretary, Board of Governors

¹ Attended Tuesday session only.

Matthew J. Eichner,² Director, Division of Reserve Bank Operations and Payment Systems, Board of Governors; Michael S. Gibson, Director, Division of Supervision and Regulation, Board of Governors; Andreas Lehnert, Director, Division of Financial Stability, Board of Governors

Rochelle M. Edge, Deputy Director, Division of Monetary Affairs, Board of Governors; Michael T. Kiley, Deputy Director, Division of Financial Stability, Board of Governors

Antulio N. Bomfim, Special Adviser to the Chairman, Office of Board Members, Board of Governors

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

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

Shaghil Ahmed, Senior Associate Director, Division of International Finance, Board of Governors

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

John J. Stevens and Stacey Tevlin, Associate Directors, Division of Research and Statistics, Board of Governors

Jeffrey D. Walker,² Deputy Associate Director, Division of Reserve Bank Operations and Payment Systems, Board of Governors; Min Wei, Deputy Associate Director, Division of Monetary Affairs, Board of Governors

Burcu Duygan-Bump, Norman J. Morin, John Sabelhaus, and Paul A. Smith, Assistant Directors, Division of Research and Statistics, Board of Governors; Christopher J. Gust, Assistant Director, Division of Monetary Affairs, Board of Governors

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

John Ammer,¹ Senior Economic Project Manager, Division of International Finance, Board of Governors

Dan Li, Section Chief, Division of Monetary Affairs, Board of Governors

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

² Attended through the discussion of developments in financial markets and open market operations.

Martin Bodenstein and Marcel A. Pribsch, Principal Economists, Division of Monetary Affairs, Board of Governors; Logan T. Lewis, Principal Economist, Division of International Finance, Board of Governors; Maria Otoo, Principal Economist, Division of Research and Statistics, Board of Governors

Marcelo Ochoa, Senior Economist, Division of Monetary Affairs, Board of Governors

Achilles Sangster II, Information Management Analyst, Division of Monetary Affairs, Board of Governors

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

Jeff Fuhrer, Daniel G. Sullivan, and Christopher J. Waller, Executive Vice Presidents, Federal Reserve Banks of Boston, Chicago, and St. Louis, respectively

Marc Giannoni, Paolo A. Pesenti, and Mark L.J. Wright, Senior Vice Presidents, Federal Reserve Banks of Dallas, New York, and Minneapolis, respectively

Roc Armenter, Vice President, Federal Reserve Bank of Philadelphia

Willem Van Zandweghe, Assistant Vice President, Federal Reserve Bank of Kansas City
Nicolas Petrosky-Nadeau, Senior Research Advisor, Federal Reserve Bank of San Francisco

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June 12 Session

CHAIRMAN POWELL. Why don't we get started a little early? If you have a cell phone, then please take my picture and then also turn yourself in for a violation. [Laughter] But I would be remiss if I didn't say, for the record, that this is the first time in 26 years that anyone has been able to sit in this chair who's a Washington sports fan and congratulate a Washington team. So congratulations to the Washington Capitals, whose Stanley Cup victory parade went by us just a couple of hours ago. It's a great day. It's something we try to do at least once every quarter-century. [Laughter]

I also want to congratulate—earnestly—Presidents Mester, Harker, Bostic, and Williams, whose teams in their Districts put up valiant, if wholly inadequate [laughter], efforts to stop the Capitals in their march to the Cup. So, anyway, thank you very much. [Puts Washington Capitals cap on head and then takes it off.] And with that—

UNIDENTIFIED SPEAKER. I was wondering when that was going to happen.
[Laughter]

CHAIRMAN POWELL. No, I'm not going to wear that the whole time.

VICE CHAIRMAN DUDLEY. I like the beads.

UNIDENTIFIED SPEAKER. The Mardi Gras beads were an anomaly.

CHAIRMAN POWELL. All right. Let's get started. As usual, today's FOMC meeting will be conducted as a joint meeting with the Board of Governors, and I'll need a motion from a Board member to close the meeting.

MS. BRAINARD. So moved.

CHAIRMAN POWELL. Second?

MR. QUARLES. Second.

CHAIRMAN POWELL. Without objection. Great. Also, before we get started, I would like to begin by noting that this is Bill Dudley's last FOMC meeting. Some of us will have more to say tonight about Bill's contributions to the Federal Reserve System at the reception. But I'd like to say a few words here at the FOMC meeting.

Bill has had a remarkable professional journey, which actually began here at the Board in 1981. He then embarked on a successful career on Wall Street. Whether it was wisdom, prescience, or some unidentified third factor [laughter]—more on that tonight—Bill returned to his Federal Reserve roots just in time to play a central role in the response to the financial crisis: first, as a manager of the Desk, and then in his current role as president of the New York Fed.

This is his 92nd regularly scheduled FOMC meeting. And even more impressive—and, no doubt, more harrowing—were the 18 unscheduled meetings in which he played a part.

VICE CHAIRMAN DUDLEY. That many?

CHAIRMAN POWELL. Yes. Bill's deep experience in finance, economics, and the ways of Wall Street—paired with his keen intellect, strong work ethic, calm demeanor, and good humor—have proven to be invaluable to the Federal Reserve and, indeed, to the national and international economy. Bill, you've been a terrific colleague. You'll be sorely missed. We wish you the very best in all of your future endeavors.

VICE CHAIRMAN DUDLEY. Thank you, Mr. Chairman. I'm going to leave my comments until the end of the day tomorrow, as is traditional. Obviously, I'll have something to say this evening as well. I'm going to hold in abeyance until tomorrow.

CHAIRMAN POWELL. And for now, we will applaud. [Applause]

I'm also sorry, for all of our sakes, to say that this will be Steve Meyer's last FOMC meeting before he retires this summer. Steve has had a long, distinguished career here, in academia and at the Federal Reserve System. He started his economics career teaching at the Wharton School, and he continues to teach there on an adjunct basis. He then joined the Philadelphia Fed's research department for a 23-year career. We were fortunate enough to attract Steve to the Board in 2008, and he has played a vital role here in helping us craft, among other things, the effective communication that is so central to good monetary policy. He has attended 79 FOMC meetings. Steve, we will miss your creativity and wisdom and your near-total obsession with the clarity of FOMC statements. [Laughter] We wish you all the best as well. Thank you, Steve. [Applause]

And with that, let's turn to Simon and Lorie for the Desk report.

MR. POTTER.¹ Thank you, Mr. Chairman. Before I start the formal briefing, I would like to say a few words about the Vice Chair. Over the past 11 years or so, Bill, first as manager and then as president, has made a number of critical and lasting contributions to the Desk's work. I would categorize them into three buckets: operational innovation; drawing unique holistic insights drawn from market analysis; and broadening our outreach for market intelligence.

Bill, during the financial crisis and after, was a thought leader in designing innovative operations to meet the direct and indirect needs of households and firms. The TALF in particular stands out in this respect. Working with Bill over the past 11 years, the number of critical insights he has had are far too many to discuss today, but one that has had a continuing effect on me—and I look back at for motivation—was his first Desk briefing in January 2007, in which subprime was the focus. Finally, from the moment Bill arrived at the New York Fed, he thought the Desk was too narrowly focused on obtaining market intelligence from the sell side. He has greatly increased our intelligence activities with the buy side and new market players. A recent example is the Desk's outreach to quantitative strategy funds last year, which allowed us to have excellent intelligence regarding the volatility spike on February 5. From everyone at the Desk, thank you, Bill. We will miss you.

Market focus over the intermeeting period was largely centered on international developments—in particular, heightened concern about vulnerabilities in emerging markets and Italy. U.S. asset prices were buffeted by some of these developments.

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

However, contacts continued to express confidence in the trajectory of the U.S. economy, and financial conditions ended little changed over the period. Shown in the top-left panel of your first exhibit, Treasury yields are slightly lower on net, while the dollar appreciated around 2 percent. The S&P 500 index rose over 4 percent and the VIX declined as market participants pointed to the positive domestic economic backdrop and its implications for corporate earnings, as well as a rebound in prices of technology-sector shares.

In the first few weeks following the May FOMC meeting, market participants were largely focused on rising U.S. Treasury yields and a strengthening dollar and their effects on the demand for emerging market assets. As shown in the top-right panel, the 10-year Treasury yield rose above 3.1 percent to levels last observed in the middle of 2011. Market participants primarily attributed the increase in Treasury yields to ongoing strength in the U.S. economy, particularly following the April retail sales release on May 15. Yields in other advanced economies did not track U.S. yields higher during this time, as a result of divergence in the strength of recent economic data prints in the United States and abroad, as discussed at our previous meeting. This divergence was highlighted by market participants as contributing to broad dollar appreciation over the period.

Though emerging market currencies have been under pressure since mid-April, there was increased attention on potential vulnerabilities during this intermeeting period. The light blue bars in the middle-left panel show the notable depreciation in major EM currencies since the May FOMC meeting. Indeed, EM currencies were the largest contributors to the 2 percent appreciation in the trade-weighted dollar, shown in the dark blue bars. Consistent with the price response observed during previous bouts of emerging market pressure, underperformance was led by Turkey and Argentina—countries with large current account deficits, thin reserve cushions, elevated inflation, and market concerns about policy credibility. More recently, attention turned to Brazil and Mexico, which came under pressure because of approaching elections in which antiestablishment candidates lead in the polls. The Mexican peso depreciated around 7 percent and is the largest single contributor to the appreciation in the trade-weighted dollar over the period. Pressure on the peso was further compounded by an escalation of trade tensions with the United States, and market participants will be highly attentive to the results of the Mexican elections on July 1 and any consequences that these may have on the likelihood of successfully concluding NAFTA negotiations.

Market participants also pointed to the unwinding of crowded long-positioning in EM currencies as perhaps exacerbating the recent depreciation, particularly in the peso, as shown in the middle-right panel. In general, the reappearance of U.S. dollar strength has surprised many market participants.

In recent weeks, European political risks also came to the fore, with substantial widening of Italian sovereign spreads to German equivalents. As shown by the dark blue line in the bottom-left panel, the most notable moves were in the two-year tenor, which reached 350 basis points, approaching the highest levels observed since the

European debt crisis. This widening started alongside news that Italian antiestablishment parties had formed a coalition, but the most pronounced moves occurred following the Italian president's rejection for office of a proposed Euroskeptic finance minister, which was seen as increasing the probability of a new general election that might center on Italy's future in the European Union and euro area. The rise in the Italian 2-year spread on May 29 was the largest one-day increase ever observed, and the move in the Italian 10-year spread was the largest since 2008. Much of the widening in Italian spreads has since retraced as the coalition successfully formed a government, reducing the likelihood of general elections in the near term.

Market participants noted that the historically outsized moves in Italian spreads were exacerbated by low liquidity. Indeed, the bid-ask spread on the two-year Italian government bond, the red line in the bottom-left panel, rose to its highest level since 2012. Although we did observe spillover arising from the heightened political risk in Italy into broader euro-area and global financial markets, other peripheral spreads to German equivalents widened only modestly and have since almost fully retraced.

Amid concern about Italian political developments, Treasury yields were temporarily affected, declining as many as 16 basis points on May 29—the largest decline since the day following the Brexit referendum. The bottom-right panel looks at changes in the 10-year Treasury yield against moves in Italian peripheral spreads, highlighting the move on May 29, in red, against observations dating from the height of the European debt crisis. The move in the Treasury yield appears to be in line with previous patterns, suggesting continued strong transmission from euro-area concerns to the United States.

Another area in which the reaction was pronounced as well as sustained was in euro-area banks, on account of their exposure to Italy. As shown in the top-left panel of your second exhibit, share prices of euro-area banks declined notably as political pressures in Italy mounted over the period, with the broader index roughly 14 percent lower, significantly underperforming U.S. banks. Italian bank share prices fell over 20 percent because of their higher holdings of Italian sovereign debt and concerns that banking-sector fragility would necessitate support provided by the Italian government, further threatening fiscal sustainability—the so-called doom loop.

Following the volatility in Italian spreads and weak euro-area data over recent months, some market participants expected the ECB to delay a discussion about the future of its purchase program and shift out the timing of rate normalization. Rates on EURIBOR futures contracts implied that the timing of a 15 basis point increase was pushed out about one quarter from the third to fourth quarter of 2019 as shown in the top-right panel. However, market participants interpreted comments by ECB officials the week following the height of Italian spread volatility as suggesting a higher level of confidence on the part of the ECB with regard to the inflation outlook and prospect for policy normalization. In response, the path of the policy rate steepened and retraced earlier moves and once again prices in a rate hike in the third

quarter of next year. Market participants are very attentive to the outcome of the ECB meeting in two days' time.

The market-implied path of the federal funds rate was little changed on net despite notable fluctuations over the period. The flattening of the path observed within the period largely occurred on two discrete events captured by the dark blue portion of the bars in the middle-left panel: following the FOMC meeting minutes and heightened Italian political uncertainty. Although the May FOMC minutes were viewed as consistent with a rate hike at this meeting, the language regarding an overshoot to inflation, coupled with the potential change to the interest rate on reserves relative to the top of the target range, led to a modest decline in policy-sensitive rates. However, much of the flattening retraced over the past two weeks, as shown in the light blue portion of the bars, following an abatement of Italian political risks, the stronger-than-expected May U.S. employment report, and comments by ECB officials.

Expectations of the path of policy rate in the June Desk surveys were similarly little changed from May. As shown in the change from the light blue to dark blue diamonds in the middle-right panel, the average probability-weighted expectation for the target federal funds rate increased slightly over the forecast horizon. Broadly, survey respondents do not expect a change to the median March SEP dots, denoted as the rose-colored circles in the panel, with the median June SEP 2018 dot expected to imply two additional 25 basis point increases in the target range. Looking at the distribution of expectations in the Desk survey, roughly one-third of respondents expect the median dot to show four hikes this year. Of those who expect it to show three total rate hikes this year, most view the balance of risks for their expectations as tilted to the upside. However some survey respondents noted that concerns about trade-related and international developments temper that upside risk somewhat.

Using our survey data since last May, the bottom-left panel decomposes the difference between the median SEP dot and the market-implied federal funds rate for year-end 2019. This calculation is done by splitting the overall difference into three subcomponents: the spread between the SEP and survey mode; the survey mode and survey mean; and, finally, the survey mean and market-implied rate. The net difference between the SEP median and market pricing, represented by the red dots, has narrowed as the horizon has shortened. The light blue components across the bars show the spread between the median SEP dot and the median modal expectation of the federal funds rate in the Desk's surveys, which has converged and remained negligible over recent months. The dark blue areas of the bars depict the spread between the survey mean and market pricing, which turned negative following the November 2017 survey. The higher market-implied rate relative to survey expectations would imply, contrary to staff model-based measures, that short-tenor term premiums have been positive since December. The gray portions of the bars illustrate the spread between the survey mode and unconditional mean expectation for the policy rate, which has remained materially wide and positive. This dynamic suggests that market participants have consistently viewed the distribution of risk around their modal path for the policy rate as skewed to the downside. This

prevalence of downside risk to policy rate forecasts may in part be due to persistent perceptions of skew toward lower levels of inflation.

As shown in the bottom-right panel, although expectations for PCE inflation two to three years ahead have shifted moderately higher since late last year, respondents on average still assign a higher probability to outcomes 1.75 percent or lower versus above 2.25 percent. Lorie will continue the briefing.

MS. LOGAN. Thank you, Simon. I'll begin on exhibit 3 by first summarizing recent changes in Treasury bill supply and money market spreads and recapping the market reaction to the discussion in the minutes of a possible technical adjustment to the IOR rate. Next, I'll discuss Desk survey respondents' expectations regarding the size of the Federal Reserve's balance sheet and the supply of reserves in the longer run, both of which increased since the December survey. Finally, I'll touch on a few operational topics, including MBS operational readiness and reference rate updates.

The dark blue line in the top-left panel shows that although Treasury bill supply is little changed since the May FOMC meeting, it has given back about one-third of the increase in issuance seen during the first quarter. Consequently, as demonstrated by the light blue line, the spread between the three-month bill rate and the comparable OIS rate—the latter of which reflects the expected path of the effective federal funds rate—has declined slightly from its recent highs but remains elevated by historical standards.

At the same time, as shown in the top-right panel, the spread between three-month LIBOR and the comparable OIS rate narrowed from a peak of about 60 basis points in early April to roughly 40 basis points. This represents a retracement of about half of its run-up during the first quarter, but the current spread sits just above the peak observed around the time of money fund reform.

Meanwhile, as shown by the gray line in the middle-left panel, the spread between the overnight triparty repo rate and the overnight RRP offering rate has not retraced and remains quite elevated compared with last year. As Treasury bills and repo are close substitutes, higher bill supply and rates tend to put upward pressure on repo rates. Additionally, increased issuance of Treasury coupon securities, which are often funded by repo, may also be contributing to higher repo rates and volumes. Reflecting the continued attractiveness and availability of bills and repo as investment alternatives, overnight RRP take-up remains low, averaging just \$6 billion per day over the intermeeting period, as shown in the middle-right panel.

Coming back to the middle-left panel for a moment, you can see that the overnight Treasury repo rate—again, the gray line—also continues to trade near or above the effective federal funds rate, the light blue line. This configuration is important because the FHLBs, which provide about 95 percent of federal funds loans and can't earn IOER, have shifted investments from federal funds to repo because of the relatively higher rates. As you can see in the bottom-left panel, not only have the FHLBs increased their repo activity over recent months, but a significant portion of

their repo lending has occurred at rates above the effective federal funds rate. As discussed in the previous Desk briefing, this shift may have contributed to the recent narrowing in the spread between the federal funds and IOER rates.

Since that time, the effective rate has been printing at 1.7 percent, with the fed-funds-to-IOER spread remaining at negative 5 basis points. The distribution of trading in federal funds has been dense around the median, as shown in the bottom-right panel, potentially indicating that the risk of an abrupt adjustment in the effective rate is low at this time.

Market participants were highly attentive to the discussion in the May FOMC minutes of the fed-funds-to-IOER spread and the potential technical adjustment of IOR relative to the target range. Although contacts expressed some surprise with the discussion, the communication appeared to be well understood.

In view of already high expectations for a rate hike at this meeting, market participants widely interpreted the minutes to suggest that the possible technical adjustment will be implemented in June. Although the implied rate on the July federal funds contract declined only 3½ basis points around the time of publication of the minutes, most contacts indicated that they expect that the effective rate will remain 5 basis points below IOER, at least initially, following the implementation of such an adjustment.

Looking further ahead, market participants expect the federal-funds-rate-to-IOER spread will continue narrowing, driven by a range of factors, including ongoing Treasury supply dynamics and the expected removal of an FDIC fee later this year. Additionally, while market participants have not widely cited the reduction in reserves to date as putting upward pressure on the effective rate, they have broadly indicated expectations that the continued decline in reserves will contribute to firming pressures. One way in which we might interpret these expectations could be that market participants implicitly believe the Committee will allow reserves to decline to a level at which they become somewhat scarce and consequently rise in price.

Your fourth exhibit focuses on the balance sheet. The Desk's surveys asked respondents to provide updated expectations for the size and composition of the Federal Reserve balance sheet, on average, in 2025, conditional on not moving to the effective lower bound between now and then.

As shown by the red diamonds in the top-left panel, the median respondent expects total assets of around \$3.6 trillion. The median forecast was only slightly higher than in December, but the light blue circles show more high values.

This shift was largely accounted for by higher expected levels of reserves. The top-right panel demonstrates that roughly two-thirds of respondents who provided complete answers when this question was last asked in December increased their expected average level of reserves in 2025. The average change was \$270 billion, and 16 of 35 respondents increased their expectations by more than \$250 billion.

To better understand their views, we asked respondents to explain any changes to their expectations since December as well as the assumptions that underlie their current expectations. However, most respondents did not provide substantive details, and a few who did comment emphasized the high degree of uncertainty surrounding their expectations. That said, a few respondents specifically alluded to the recent narrowing in the fed-funds-to-IOER spread or the discussion of the technical adjustment or both as shaping the change in their view.

We used these updated expectations, along with the interest rate forecasts in the surveys, as inputs to SOMA portfolio projections akin to those we've published previously. The middle-left panel compares results using June survey data, the solid lines, to those using the December survey, the dashed lines, illustrating how the portfolio could evolve under three alternative liabilities scenarios.

Taking into account the updated inputs, particularly the higher expected average levels of reserves in 2025, the timing of normalization for the size of the balance sheet occurs earlier in each of the liabilities scenarios shown. In the larger-liabilities scenario, which is based on the 75th percentile of survey responses for each liability line item and a number of additional assumptions, normalization occurs in June 2019—eight months earlier than in the December projection. You can see this in the solid dark blue line in the middle-left panel and in the first row of the table in the middle-right panel. The middle-right panel further summarizes the implied normalization timing and expected level of reserves associated with each of the scenarios. As you can see, the results vary significantly. The median and smaller liabilities scenarios imply that the size normalizes at the end of 2020 and the beginning of 2022, respectively.

Regarding more immediate balance sheet projections, as shown in the bottom-left panel, using Desk models, MBS reinvestment purchases are projected to slow significantly in July and then cease in October. However, there is substantial uncertainty regarding these projections because MBS principal payments are highly dependent upon long-term interest rates and various other factors. Of note, projections of MBS principal payments are also subject to forecast errors that can result from different model specifications. For example, ahead of the June reinvestment period, our models had forecast MBS principal payments to total about \$17.7 billion to \$20.7 billion, while the final estimate came in higher at about \$22.5 billion.

As summarized in the bottom-right panel and discussed in a recent staff memo, under the current reinvestment policy and directive, if actual principal payments were to exceed the \$20 billion cap before the size of the balance sheet is normalized, the Desk would engage in MBS reinvestment purchases. Specifically, as currently directed, the Desk would reinvest in agency MBS the amount by which the principal payments received on agency debt and MBS during any month exceed \$20 billion. Although the probability of this occurring is difficult to judge, various models indicate a nontrivial likelihood that principal payments will exceed the cap during one or more months between the fourth quarter of this year and the end of 2020.

To maintain appropriate readiness, the Desk intends to conduct small-value MBS purchases of up to \$300 million per month for some time after principal payments first fall below the cap. The Desk will review the size and frequency of these test operations over time and update the Committee as necessary. The Desk intends to communicate this plan in a manner similar to other communications on small-value operations. In terms of timing, the June FOMC minutes could be followed with a Desk statement and updated FAQs later in the summer that would provide specific details about how the Desk will inform the public whether it's conducting reinvestment operations or small-value test operations in the coming month.

Your fifth exhibit summarizes a few reference rate updates. First: “A *Federal Register* Notice was issued in mid-May requesting public comment on revised instructions to the FR 2420 report to capture onshore overnight wholesale borrowing activity in the production of the overnight bank funding rate.” Second: “On May 7, the CME launched one-month and three-month futures on the Secured Overnight Financing Rate, one of the Fed’s new overnight Treasury repo rates and the rate the Alternative Reference Rates Committee selected as its recommended alternative to U.S. dollar LIBOR for use in certain derivatives contracts.” Third: “Over the upcoming intermeeting period, the New York Fed plans to update its Statement of Compliance with the IOSCO Principles for Financial Benchmarks to include the three overnight Treasury repo reference rates. The statement was initially issued in January to cover the EFFR and OBFR.” Relatedly, the New York Fed released its Statement of Commitment to the FX Global Code on May 24, and each of our FX counterparties has also committed to the code.

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

CHAIRMAN POWELL. Thank you, Simon and Lorie. Questions for Simon and Lorie?

President Rosengren.

MR. ROSENGREN. A question for Lorie. The reinvestment program has worked out very well. For the MBS, if we were to make an announcement that we no longer thought we needed caps for the MBS, what do you think the market reaction to that kind of announcement would be, in view of the fact that you're projecting that it's relatively unlikely that we would be hitting the caps anyway, and the fact that we have argued that we want to move toward a Treasury-securities-only portfolio? Do you think it would be disruptive, under your projections, to eliminate that cap?

MS. LOGAN. When we did some surveys very early when the reinvestment policy was first announced, I think the expectation was something on the order of the MBS spread widening around 20 basis points.

My sense, on the basis of talking with market participants, is that the plan that's been announced so far hasn't fully been priced in to that MBS spread, that we're somewhere less than that full 20 basis points as yet. So I suspect that there's still some room to go even under the current plan. I think if you were to announce an adjustment, there would likely be some further widening in that MBS spread, because you're changing the distribution of potential outcomes, particularly if interest rates were to fall. So you're putting more of that convexity risk back to the market. It's hard to know what the order of magnitude of that would be, but I would expect some amount of widening.

I would say, though, that on the market-functioning side, I think the MBS market is functioning quite well. Liquidity seems to be generally strong, even as the amount of reinvestments is expected to come down.

MR. POTTER. It's not a surprise that we're projecting we'll be under the cap. The construction was to give market participants some understanding that if interest rates dropped a lot, a large amount of mortgages would prepay, but, after a certain point, the caps would bind and we would reinvest. That was the design made last year, and that's still true. I think the one difference is, our estimates may be a little bit higher under current interest rates of how many paydowns we'll get.

CHAIRMAN POWELL. Governor Quarles.

MR. QUARLES. Somewhat related to President Rosengren's question, with regard to the small-value monthly purchases, just to keep the pipes clear—how will you know when that's

no longer necessary? I mean, will it be a Potter Stewart situation—you know it when you see it? Or is there a test that would allow you to say, we no longer need to do this?

MS. LOGAN. I think our sense is that we'll learn something from doing those operational readiness tests over time, and we'll be able to change the amount so that we're not doing as much. And if things are continuing to progress well, we can lower that amount or potentially even remove doing that, or not do it every month. So I think we'll be able to come back to the Committee after the first couple of months and say whether continuing would be needed.

I think the risk of needing to reinvest again is likely to be the highest around the summer months, because that's when the prepays tend to rise. The summer might be another good opportunity to revisit that question, because if we don't see those reinvestments in the summer in 2019, I think that would be another good opportunity to reconsider that small-value test.

CHAIRMAN POWELL. I have questions. Lorie, this reestimation of the size of the balance sheet at which reserves become scarce is pretty big. I wonder, can you elaborate on that a little more. I think you said it had to do with the fact that IOER was trading closer to RRP. What do you think's going on?

MS. LOGAN. In the survey we asked the respondents to describe both their assumptions and what might have driven those changes, but there were only a handful of respondents who provided clear answers. And the clear answers that we got were the two that I noted. One was just that the federal funds rate moving higher in the range may have sparked thoughts that the amount of reserves in the system that are needed may be larger, or that the discussion of the technical adjustment, or perhaps even that the long-run framework discussions they've been hearing may have influenced that. But I would be skeptical, because it was only a couple of

respondents, and generally we didn't get very good qualitative responses to either of those two questions from most of the people who replied.

CHAIRMAN POWELL. Just to be clear: Were there only a couple of respondents on the change in the size, or only a couple that provided explanations?

MS. LOGAN. Only a couple that provided explanations. On the change in size, the numbers are under the chart. We did the match samples for those who replied, both in December and in June. With respect to the change, I think that was pretty notable across a lot of respondents.

With respect to the actual qualitative responses, it was very small. If we had to infer what may also be driving things—with actual facts not being obtainable from the survey—my sense is that there were a number of strategists who did more detailed analysis over this and the previous intermeeting period, and it could be some sort of echo effect, in which people have read those analyses by some notable strategists and have consequently started to change or inform their thinking.

I think another possibility is, as we've talked more about what the floor system might look like, they've thought about what type of buffer may be required, and maybe they hadn't thought about that earlier last year. But those are just guesses based on what we're seeing; we didn't see it in the survey results that I described.

MR. POTTER. Let me just add that this doesn't necessarily mean reserves are scarce at the number they are given in that survey, because if it's a floor system, reserves wouldn't be scarce.

CHAIRMAN POWELL. Right. Understood.

VICE CHAIRMAN DUDLEY. Part of this issue is that this was never very well nailed down, how much excess reserves you're going to need in the system to keep the federal funds rate trading where you want it to trade. So any new piece of information can perturb that expectation quite a bit, because no one really actually knows. And I think the thing that makes it so hard to know is, we have a new set of regulations with respect to liquidity that may have altered the demand for reserves in ways that we don't fully appreciate. So I would imagine that this is going to continue to move around as we get little pieces of information that inform people's judgment, just because we're starting with a pretty broad range of possible outcomes.

MS. LOGAN. And you can see that in the width of the expectations. It's a very wide set for those numbers.

CHAIRMAN POWELL. Governor Brainard.

MS. BRAINARD. Yes. Just further on that point, I've certainly heard a variety of market participants suggesting that perhaps supervised entities are likely to keep more of their HQLA in reserves than perhaps we had anticipated. Do you have any way of assessing whether that hypothesis is true?

MS. LOGAN. We've started some systematic outreach to the banks, and we've done that through interviews and also on the basis of notes written by the supervisors. And of the 18 banks that we've looked at, we've gotten a sense of what they see as their minimum cash amounts. In other words, what amount they would pay out to maintain that level of reserves.

And we've learned something from that. I think that the regulations have changed the way they think about holding reserves—maybe not because of an explicit piece of the regulation, but maybe because of an implicit sense of the regulation—for example, whether they can monetize the other HQLA, which, of course, you wouldn't have to with reserves.

In the case of the banks that we've talked to, another thing that I think that is affecting some of it is intraday payments. In the case of those large institutions that may be dealing with large payment flows, they think about the need for holding reserves relative to those payments a lot differently than they did pre-crisis. So a firm like that would be asking for a much larger minimum level of reserves.

I think that it is definitely true that the supervisory structure has affected the way that banks will be thinking about reserves, and market participants are starting to add those numbers up, and that may be influencing some of these numbers as well.

CHAIRMAN POWELL. Thanks. Further questions? [No response] If not, we need a motion to ratify the domestic open market operations conducted since the May meeting. Do I have a motion to approve?

VICE CHAIRMAN DUDLEY. So moved.

CHAIRMAN POWELL. All in favor? [Chorus of ayes] Any opposed? [No response] Thanks very much. Next we'll turn to the review of the economic and financial situation. And in the interest of tinkering with our meeting format, we will have the domestic and international briefings, followed by Q&A, and then the SEP briefing, followed by Q&A. Norm, take us away.

MR. MORIN.² Thank you. I'll be referring to the materials titled "Material for Staff Presentation on the Economic and Financial Situation." I'll start with a brief overview of the staff projection, comparing aspects of the projection to the December 2017 forecast. Then I will address a question that some of you have raised—namely, the different signal about resource tightness being sent by manufacturing capacity utilization compared with the staff's broader measures of resource use: the output and unemployment gaps.

Let's turn to your first exhibit. In our projection, as shown to the left, output continues to expand at an above-trend pace through next year before slowing to its potential growth rate in 2020, as monetary policy tightens further. As shown in the right panel, compared with the December Tealbook, real GDP growth is about ½ percentage point faster this year and next and about unrevised in 2020. As shown

² The materials used by Messrs. Morin and Kamin are appended to this transcript (appendix 2).

in red, our estimates of the effect of the tax cuts and spending package more than account for the revisions in 2018 and 2019. For growth in 2020, these larger fiscal policy effects are essentially offset by other factors: financial conditions (in green), which include the higher path of the exchange rate; small effects of oil prices (in light blue); and our assumption of supply constraints (in blue). As shown in red in the bottom-left panel, the latest reading on spending in May that we construct using information supplied to us by First Data support our view of a rebound in PCE growth from its Q1 lull.

In your next slide, I turn to the labor market. The two employment reports received since the May FOMC meeting point to the labor market continuing to tighten and by a little more than we had expected. The unemployment rate declined 0.3 percentage point over that period, to 3.8 percent in May—its lowest level since 1969. As displayed in the upper left, jobless rates have continued to decline across most races and ethnicities. Shown to the right, prime-age labor force participation, the black line, has improved, and even more so relative to its declining trend. Although the data are quite volatile, participation rates appear to be generally rising across races and ethnicities.

The blue line in the bottom-left panel plots our alternative estimate of private employment gains that combines BLS private employment (in red) with a measure we construct using ADP's company-level data (in black). This alternative measure, which provides our best estimate of private job gains, has run around 175,000 the past few months.

Moving to the right, we expect the unemployment rate to move down into 2019 and to move sideways in 2020, when output increases roughly with potential. The revision to the unemployment rate since the December Tealbook is smaller than one would expect in light of the revision to real GDP. We have attenuated the decline in the unemployment rate because we assume that in an extremely tight labor market, a larger-than-usual amount of tightening in resource utilization will manifest in a higher labor force participation rate, as individuals are drawn into the labor force.

Regarding inflation, as shown in your next slide, the 12-month changes in April for total PCE prices, 2 percent, and for core PCE prices, 1.8 percent, were one-tenth lower than expected. The downward surprise was concentrated in nonmarket prices, a component that carries essentially no signal about future price changes. As shown to the right, we forecast both total and core inflation to move up a bit over the next few months, with the larger rise in total PCE inflation reflecting the increases in oil prices.

In the table to the right, the first and third rows show our forecast as it stood last night. In this morning's CPI release for May, the core and topline indexes both increased 0.2 percent. In response to this information, we've revised up our estimate of core PCE inflation in May by a few basis points. As a result, our forecast of 12-month core inflation in each of June and September now rounds up to 2 percent, in contrast to the 1.9 percent shown on line 3 of the table, and our forecast of topline

PCE inflation, shown on line 1, is unrevised in June and up one-tenth to 2.1 percent in September. The May increase in PCE prices remains no more than a forecast, because we won't have the relevant PPI components until tomorrow morning and won't have the nonmarket prices until the BEA publishes its May estimate at the end of this month.

Your next slide shows our medium-term projection of inflation. Core PCE inflation is projected to edge up from 1.9 percent this year to 2.1 percent in 2020, which, as shown to the left, is a bit above our estimate of its underlying trend. As shown in red to the right, the projected rise in inflation above its trend mainly reflects the further tightening of resource utilization that more than offsets restraint arising from a projected deceleration in core import prices (in green). Core inflation in 2020 also includes a small boost resulting from our assumed supply constraints.

Total PCE prices, shown in the bottom left, are expected to increase 2.1 percent this year. If we compare the bars, PCE price inflation this year has been marked up since December but is little changed for the period ahead. And to the right, the sizable upward revision this year mainly reflects higher energy prices and a slightly higher core PCE projection; 2020 is marked up a little, in order to reflect the supply constraints that I mentioned.

The black line in the top left of your next slide shows that federal debt as a percent of GDP has grown substantially in recent years, and the staff projects an increasing ratio in the coming years (the red line). In forecasting developments over the long term, however, the staff assumes that the debt-to-GDP ratio will be stabilized. I'll illustrate with a simple example the magnitude of the deficit reduction implicit in this assumption.

As shown in the middle, the change in the debt-to-GDP ratio depends on the size of the primary deficit (the deficit excluding interest payments) relative to GDP and the difference between the effective interest rate on federal debt and nominal GDP growth. Assuming that the effective interest rate is about equal to nominal GDP growth—which it has been historically, on average—the debt-to-GDP ratio stabilizes when primary deficits are zero.

Shown to the right, the blue portions of the bars represent the size of the primary deficits over the forecast period, which move up to 3 percent of GDP in 2019 and 2020. The solid blue portion is the primary deficit excluding the TCJA and BBA; the effect of the deficits on the TCJA and the BBA are the hatched portions. Note that we assume for 2020 the appropriation caps will remain constant in real terms, though the BBA expires at the end of fiscal year 2019.

If primary deficits persist at 3 percent, then stabilizing the debt-to-GDP ratio will require deficit reductions approximately equal in magnitude to reversing the recent spending increases and tax cuts, plus eliminating the portion of the primary deficit excluding these legislative changes, which itself is equivalent in size to a reduction of a second TCJA.

Let's turn now to your next slide. The output gap and the gap between the unemployment rate and its natural rate—two of the staff's estimates of resource utilization—have tracked each other closely over time, in part because potential output and the natural rate of unemployment are not derived independently. To make direct comparisons easier in this chart, I normalized these measures by dividing each gap by its standard deviation, and I inverted the unemployment gap. Their positions relative to the horizontal line at zero reflect the number of standard deviations that each is from its neutral level. For example, the output gap, which ends 2020 at about 3 percent, is shown by the blue line to be just over a standard deviation above its neutral level at that point, and the inverted unemployment rate gap (in red) is just under a standard deviation past its natural rate.

A third measure, shown in black, is our measure of manufacturing capacity utilization relative to an estimate of its long-run "neutral" level. Unlike the other two measures, manufacturing capacity utilization pertains to resource use in about only 12 percent of the economy. However, it is estimated independently of the other measures.

From the mid-1960s through the early 1990s, the capacity utilization gap closely tracks the other gap measures. Since then, however, the manufacturing utilization gap has mostly tracked below the output and unemployment gaps. All three measures fell sharply during the Great Recession and subsequently recovered, but the utilization gap has been moving roughly sideways since 2012, even as the broader gap measures have tightened past their estimated neutral levels. Over the projection period, the difference grows into the largest "gap in the gaps" on record.

In the next few slides I will explore some of the causes of this divergence to better understand the degree of tightness in the economy. Although the reported capacity utilization rate remains low, labor in manufacturing appears stretched. The average workweek of manufacturing production workers, shown in the left panel, is running at levels not seen since World War II, and overtime hours, not shown, are also elevated.

The survey of plant capacity, from which we derive our estimates of capacity utilization, asks plant managers why they are operating at less than full capacity. Not surprisingly, the most common response is always "lack of demand." The second most common reason, shown to the right, is "insufficient supply of local labor or skills," which has risen sharply the past few years to around its highest levels since the late 1970s. These indicators suggest that manufacturing could have a harder time expanding than the low levels of capacity utilization would indicate.

On your next slide, even as there is evidence that labor resources in manufacturing are stretched, plant hours are below historical norms. The panel to the left, also using the survey of plant capacity, shows the number of hours per week that factories are operating. Plants producing nondurable goods (the blue line) are currently running about 120 hours per week, a typical level for these producers. The black line shows weekly plant hours for durable goods producers outside transportation equipment. During the Great Recession, the work period of these

plants fell 20 hours below pre-recession levels and has only recovered somewhat. This decline and recovery is equivalent to about half the plants dropping a shift during the recession and only half of those plants subsequently adding one back.

Capacity utilization may be low because some plant managers are reporting a baseline for capacity that is consistent with “normal” pre-recession levels rather than their current state. But if one assumes that the reduced plant hours in durable goods industries are the new normal, and they’re not going to return to pre-recession production patterns, capacity would be lower and overall manufacturing utilization rates currently would be about 4 percentage points higher. The utilization gap would be nearing its neutral level, but the “gap in gaps” would nevertheless remain large.

This and the previous exhibits suggest that factories are perhaps operating at a somewhat higher “short run” level of capacity utilization compared with the published figures. With that in mind, I now explore the principal reason why manufacturing capacity utilization has failed to increase materially the past few years.

Comparing the red and black lines in the left chart of the next slide, manufacturing IP and real GDP rose at essentially the same trend rate for decades, with IP showing larger cyclical swings. During the Great Recession, manufacturing IP, as is typical, fell much further than real GDP. But as shown in the table to the right, in the years following the recession, and despite GDP recovering at a historically subpar pace, manufacturing has grown only half as fast as GDP, widening the gap between the two.

On your next slide, two trends appear to be weighing on domestic manufacturing. First, the chart on the left shows the goods and structures share of private domestic final demand. As a result of the continuing shift to spending on services, the goods and structures share of domestic demand has dropped more than 15 percentage points the past few decades and continues to decline (within goods and structures, the durables and construction shares have been particularly low recently). Further, as shown to the right, the staff’s flow-of-goods system shows the share of domestic demand that is satisfied by domestic production has also trended downward, falling about 20 percentage points since the mid-1970s.

Your next slide actually shows something positive. [Laughter] The top edge of the black region in the chart to the left shows manufacturing output, which is decomposed into the contributions made by domestic demand and by exports. The red area shows domestic production of goods that are consumed domestically. At the end of 2017, domestic demand for domestic goods was only around the same level as 20 years ago, in the mid-1990s. The black region represents the contribution of exports to domestic manufacturing output. As shown in the table to the right, exports account for nearly two-thirds of the growth in manufacturing output from 2011 to 2017.

To conclude, the low rates of manufacturing capacity utilization suggest ample slack remains at the nation’s factories even as other measures of resource utilization,

such as the output gap and the unemployment rate relative to its natural rate, have moved past their sustainable levels. The published utilization rates perhaps mask a higher “short run” operating rate, but the principal reason for low utilization is the anemic manufacturing recovery, which reflects the subpar pace of the overall recovery layered with the composition and sourcing of domestic demand.

Granting all that, the lower operating rates also could partly reflect a longer-run declining trend in operating rates that is independent of those factors. First, responding to trends in the cost of capital, plant managers could be choosing to hold a larger buffer of excess capacity to satisfy unpredictable demand rather than the classic practice of smoothing production by building inventories. This would lead to lower optimal industry utilization rates. Finally, the literature on declining business dynamism that documents the slowing of start-up activity suggests a flipside: Just as new businesses have been slower to form the past several years, less-productive plants have been slower to shutter—which, for this story, would prop up capacity and thus lower utilization rates. Steve will now continue our presentation.

MR. KAMIN. Thank you, Norm. I’ll be starting off on the next page of your handout. In perhaps a first for the FOMC, I’d like to open my remarks with a quote often attributed to Chairman Mao Zedong: “There is great chaos under heaven. The situation is excellent.” [Laughter] As far as the global economy is concerned, I’m not sure I would go so far as to say the situation is excellent, but considering the many risks swirling around, it could be a lot worse.

As can be seen in your first slide, after growing nearly 3 percent in 2017, a little above potential, real GDP in the foreign economies is expected to maintain that pace this year and edge down just a bit over the remainder of the forecast period. A lot of attention has been paid to the weakness of incoming data in the advanced foreign economies, which pushed first-quarter AFE growth—the red line—below our April estimate. But much of this weakness likely owed to transitory factors like bad weather and labor strikes. Moreover, EME growth—the blue line—surprised on the upside. So we don’t think we’re seeing a significant slowing of the global economy, and we’ve revised our outlook down just a touch since the April Tealbook. By the same token, several prominent downside risks have become more apparent since your previous meeting, but unless they intensify further, they are unlikely to have more than a small effect on foreign real GDP growth.

Starting with trade policies, your next slide, the U.S. Administration has rescinded its temporary exemptions from the steel and aluminum tariffs, set a June 15 deadline to finalize tariffs on almost \$50 billion in Chinese goods, announced an investigation to consider protections against auto imports on grounds of national security, and bogged down on negotiations over NAFTA. Several of our trading partners have signaled retaliatory actions. We are not in a full-blown trade war, but its probability is rising. Additionally, policy uncertainty could start to weigh on global trade and investment, although we haven’t seen much evidence of that yet in the data.

A second risk factor relates to increased financial stresses in emerging markets, as shown in slide 15. Panel 1 shows that countries with more pronounced vulnerabilities have experienced larger depreciations of their currencies. Turkey and Argentina have been hit hardest, reflecting their large fiscal and external deficits, reliance on foreign financing, and concerns about central bank independence. But other countries have also experienced stresses, raising the question of whether some common shock, such as rising U.S. interest rates, might be responsible. The evidence on the role of U.S. rates is murky, as shown in panel 2; U.S. interest rates have been rising for many quarters, but the dollar has only recently appreciated against EME currencies. In any event, as the credit spreads in panel 3 show, financial pressures on EMEs remain muted compared with previous stress episodes, and so, at this point, EME turbulence remains a downside risk rather than a factor dragging down our baseline outlook by much.

In the past, financial conditions in the AFEs and EMEs have taken turns being stressed, which has also helped to relieve stress among our staff. This time, as I turn to your next slide, the spike in EME volatility combined with a resurgence of euro-area woes. As Simon has described, markets have calmed some since Italy formed a government and the immediate risk of new elections was averted. Nevertheless, the new government's inclination toward fiscal laxity and its ambivalence toward the European Union are likely to keep markets on edge, weighing on asset prices and on the flow of credit and spending. On the assumption that political and market pressures will restrain the government from undertaking especially damaging policies, we've revised down the outlook for Italian and euro-area real GDP growth only moderately. But the political situation is fragile, and, as we explored in a Tealbook alternative scenario, much more adverse outcomes are possible.

The risks associated with trade, emerging market volatility, and Italy reinforce our conviction that monetary policy normalization will proceed only very slowly in the advanced economies, as illustrated in your next slide. Policy rates should take years to hit their new normal levels and, in some cases, will likely end up well below their pre-GFC levels.

This brings us to the final risk I'd like to discuss today. Observers have raised concerns that a further prolonged period of sustained low interest rates—a so-called low-for-long scenario—would add to pressures on profitability in the financial system, incentivize greater risk-taking, and thus threaten financial stability. To explore these concerns, the BIS Committee on the Global Financial System, or CGFS, under the leadership of Vice Chair Dudley, initiated a study group composed of representatives of 19 central banks, led by Ulrich Bindseil of the ECB as well as myself. As an aside, let me mention that Bill has done a great job of chairing the CGFS, and all of the members of the committee will certainly miss him.

The “low rates” study group focused on the profitability and behavior of banks, insurance companies, and pension funds. As shown on your next slide, it considered three distinct interest rate scenarios, constructed for 22 countries, illustrated here using the example of the United Kingdom. Focusing on panel 1, the baseline

scenario, the red line, is largely based on IMF projections for all the countries in the study and entails a gradual rise in interest rates to more normal levels. In the low-for-long scenario, the blue line, continued weakness in economic growth and inflation keep nominal interest rates very low. Finally, in the snapback scenario, the yellow line, rates remain very low initially but later rise sharply in response to a pickup in inflation from low levels. This scenario is intended to address the possibility that risk-taking adjustments by financial institutions to low rates might make them more vulnerable should interest rates subsequently rise.

I'd like to briefly summarize our main findings, focusing on banks in the advanced economies. As indicated in your next slide, we estimated panel data regressions to explain net interest margins, or NIMs, as well as the overall profitability of banks as measured by return on assets, or ROAs, on the basis of the short-term interest rate, the slope of the yield curve, and macroeconomic conditions such as GDP growth and inflation. Regarding the coefficient estimates shown below, both the level of short-term interest rates (panel 1) and the slope of the yield curve (panel 2) positively and significantly affect bank NIMs. We are still investigating why the effect is larger in the United States than in the advanced foreign economies. However, the effect of these interest rate variables on banks' overall profitability, or ROAs, is quite small, suggesting that banks have found ways to offset the effect of lower interest rates on NIMs, such as by cutting costs and switching to fee-based activities.

Using these estimates, we constructed projections of bank NIMs and ROAs for the baseline and low-for-long scenarios, as shown on your next slide. While NIMs would fall materially in a low-for-long scenario, ROAs would not. It looks like prolonged low interest rates would have only minimal effects on overall bank profitability and thus resilience to adverse shocks, at least on average in the advanced economies. The regression approach described here is less useful to analyze the snapback scenario, something I will return to shortly.

Our findings regarding the potential of low interest rates to encourage risk-taking behavior at banks, the topic of your next slide, were also moderately reassuring. Looking at the low interest rate period following the GFC, there was some evidence that banks had shifted their assets toward longer maturities (panel 1) and greater concentration in real estate loans in some economies (not shown). But the aggregate data show little evidence of more exuberant risk-taking; for example, credit-to-deposit ratios (panel 2) have declined since the GFC for both U.S. and AFE banks. And, focusing on two major economies in which interest rates have been especially low (panel 3), bank-credit-to-GDP ratios are still declining in the euro area and remain well below 1990s levels in Japan. Finally, extensive panel data analysis revealed little correlation between interest rates and measures of bank soundness and risk-taking.

Despite these benign findings, however, we judged that a low-for-long scenario could still engender material risks to financial stability. First, as shown on your next slide, we found that interest rates may exert particularly strong effects on bank profits

in countries whose interest rates are already very low, in which banking markets are more competitive, and in which banks are more dependent on deposits for funding. Thus, especially in light of their already low profitability, many small retail banks in Europe and Japan might indeed be at risk in a low-for-long scenario.

Second, turning the page, the relatively subdued risk-taking we identified might reflect de-risking and the tightening of regulations in the wake of the GFC. Such restraint might erode if interest rates remain low and continue to depress returns and profitability. This might be especially likely in situations in which economic growth picks up, but low inflation restrains policy tightening.

Third, as per your next slide, a future snapback in interest rates could lead to valuation and credit losses, and such effects could be exacerbated if banks responded to a previous period of low rates by extending durations and shifting loans to the interest-sensitive real estate sector. The panel shows a simulation analysis featured in the study, using the Swiss National Bank's microdata-based model of Swiss retail banks. Net earnings fall even more in the snapback scenario, the orange line, than in the low-for-long scenario, the blue line. And, if a 30 percent fall in real estate prices is assumed (the purple line), earnings fall even more.

These simulation results broadly mirror those obtained under scenarios considered in U.S. stress tests in recent years. They underscore the importance of ensuring that financial institutions are resilient to sharp changes in interest rates, a key policy message of our study's report. That concludes our presentation, and Norm and I would be happy to answer your questions.

CHAIRMAN POWELL. Thanks very much. Questions for Norm or Steve or both?

President Kashkari.

MR. KASHKARI. Thank you, Mr. Chairman. Norm, thank you for the presentation on manufacturing utilization. I was one of the people who asked about it previously, so I appreciate it.

I'm curious how much discretion there is when businesses fill out those surveys, and let me give you an example. I was recently in northern Minnesota, and I visited an aircraft manufacturer, Cirrus, that makes small airplanes. And, of course, the management team kept telling me they just can't find workers—they're at capacity. So I started asking more questions, and I said, "What kind of shifts are you running?" And they run one shift four days a week. And I said, "Well, why don't you work on Fridays?" And they said, "Well, our employees like

to go fishing on Fridays.” And I said, “Well, what are your competitors doing?” They said, “Our competitors run three shifts 24/7.”

I’m curious. From Cirrus’s perspective, they’re probably at capacity. I heard that discussion, and I heard, well, if there’s a lot more demand, they can pay their employees overtime and they can work an extra day. I’m just curious, how would that be viewed in these surveys? Is Cirrus at capacity, or is it completely up to them to determine if they’re at capacity or not?

MR. MORIN. The plant managers are instructed to assume the capital in place and sufficient labor, but the normal shift pattern. So if traditionally they run just one shift, then they would fill out the forms assuming just one shift. But if they’re not as staffed up as they would like to be, they might be operating, according to the survey of plant capacity, at less than 100 percent, because if labor and materials were fully available, they would be able to produce a bit more. But they would be answering as a one-shift plant.

MR. KASHKARI. I’m sorry, let me make sure I understand. If they really did have a worker shortage, as some assert, that would then lead the surveys to conclude that they were below capacity, that there was spare capacity?

MR. MORIN. Right.

MR. KASHKARI. So that would be a consistency between the labor market view of the output gap—meaning, we are running above potential—and still showing unused capacity in the manufacturing surveys. I thought those two were sending different signals. That would imply that they could be consistent. Maybe I’m misunderstanding.

MR. MORIN. Well, again, if the specific plant, given its capital and equipment in place and running their normal number of shifts, did not have as much labor as they would normally

use to operate the machinery fully, then they would be running at a utilization rate that is lower than 100 percent, according to that survey.

MR. KASHKARI. Okay. Thank you.

CHAIRMAN POWELL. President Rosengren.

MR. ROSENGREN. The low-for-long discussion was quite interesting. We're actually having a conference on it this fall, although we're less focused on banks, more focused on nonbanks. But I think it is an interesting issue. You didn't mention how portfolio allocation changed. If I were a bank in Europe, and I was thinking about emerging market Europe, for example, and increasing my exposure there, or taking other kinds of risks—did you look at portfolio risks as well as expanding the duration? Because there are many ways that you can reach for yield. And I would think the easiest, if I were a European bank, would be looking at Eastern European or emerging markets in a way that I hadn't before. You may not have looked at it, but is there any evidence of shifts in portfolio allocation to a riskier portfolio?

MR. KAMIN. We did look at such data as were available on that topic. We were a little bit hamstrung by the lack of uniform data across advanced economies. But in the case of Europe, for example, we looked at measures they had of the quality of loans, and those did not appear to have deteriorated.

We also looked at credit standards that come from the ECB survey of European bank lending. And those actually indicated only a very moderate loosening of credit standards in the years since the euro crisis, which was a much smaller loosening of credit standards than the tightening of credit standards that had taken place during the preceding period of crisis.

And then, finally, apropos of the issue of switching their lending to more higher-return sources, such as emerging markets, European banks have done the opposite in response to

de-risking and in response to tighter regulation. They have actually pulled back tremendously from their emerging market investments, leaving that field open for other banks.

Undeniably, there have been some pockets of greater risk-taking. For example, the Swiss have been very focused on concerns in their markets in which Swiss banks are very highly exposed to what, at least by their standards, is a housing bubble. But we didn't find that to be more generally the case. My colleague, John Ammer, worked a lot on that. Did I miss anything there?

MR. AMMER. There is some evidence that Japanese banks expanded internationally, but mainly to other advanced economies, not to emerging markets.

CHAIRMAN POWELL. Thank you. President Bullard.

MR. BULLARD. Thank you, Mr. Chairman. My question is on page 19 of the presentation here, "Estimated Effects of Rates on Bank Profitability." According to panel 2 which shows the yield-curve slope, how am I supposed to read the 0.30 here? And then I go to the ROA yield-curve slope, it's minus 0.05 or something. I guess the first question is what is the scale?

MR. KAMIN. I think the way I would read that—and I'll invite John to correct me if I'm wrong—is that an increase in the slope of the yield curve by 1 percentage point would lead to an increase in NIMs of 0.3 percentage point. The NIMs are varying from 1 to 4, so that gives you a sense of the magnitude. Is that right, John?

MR. AMMER. It's 32 basis points.

MR. KAMIN. Okay.

MR. BULLARD. Okay. But the point is that the ROA would be smaller; the sensitivity would be smaller.

MR. KAMIN. Right. Let's put it this way. We are looking at the ROA numbers in cases in which they are showing negatives as being probably more in the neighborhood of a statistical aberration, rather than something that we think you should focus on.

MR. BULLARD. Okay. But you might say "zero."

MR. KAMIN. Yes, exactly. So the message that we take from these regressions is that interest rates definitely affect NIMs in a positive direction, but ROAs less so. It could be that there actually is a genuine reason why there's a negative effect on ROAs, but that's not where we've been focusing.

MR. BULLARD. Okay. I guess what I was thinking when you were describing this is, when I watch market commentary and interest rates move around, bank stocks seem to be extremely sensitive to this. But this would suggest that they shouldn't be. How should I think about that?

MR. KAMIN. Well, a couple of things. First of all, this is looking at the effect of interest rates and yield curve slopes on bank profits holding constant real GDP growth and inflation and other things. Sometimes you have changes in interest rates that are a direct result of monetary policy shocks. And in those cases, the monetary policy shocks could be affecting a lot of variables in the environment that banks face.

So you have to look at that experiment. And I think event studies tend to show that when you have surprises in interest rates, bank stock prices do go down. That could be because the increase in interest rates is affecting the environment; it could also just be affecting the present discounted value of future profits for banks.

MR. BULLARD. Yes. So the Italian turmoil during the intermeeting period—the longer-term rates in the U.S. rates, and I guess global rates, fell dramatically, bank stocks were

totally creamed. And I think it was because people said they aren't going to be able to make any money at these lower rates.

MR. KAMIN. You mean in the most recent—

MR. BULLARD. Just now. Just in the past couple of—

MR. KAMIN. I would say what we saw most obviously is bank stocks in Europe being really creamed just because of the likelihood of something terrible in Italy happening, and a lot of these European banks have a lot of exposure to Italy.

MR. BULLARD. Okay.

MR. KAMIN. Why U.S. bank prices have fallen I'm a little less sure about.

MR. POTTER. A lot of prices of bank stocks are up 2 percent since the previous meeting. Europe is down 12 percent. I think those are some of the reasons.

MR. ROSENGREN. More credit losses than interest rates.

MR. BULLARD. Yes, okay. Thank you.

CHAIRMAN POWELL. Thank you for the questions. No further questions, so we'll turn it over now to Dan for the SEP briefing. And let me say that, with the changes in the SEP, with the change in the median for 2018 from three rate increases to four, and with the increasing number who are calling for a modest overshoot, I think this potentially could be a subject for the press conference tomorrow. So I would particularly welcome questions and insights that participants may have after the staff briefing. Over to you, Dan.

MS. LI.³ Okay. Thank you. I will be referring to the packet labeled "Material for Briefing on Summary of Economic Projections." To summarize, changes in your projections relative to March are modest. Your current projections show slightly lower unemployment from 2018 through 2020 and marginally higher GDP growth in 2018. Most of you noted that your revisions reflect, in large part, strength in incoming data. A large majority of you project that the unemployment rate will be at or below 3.5 percent by late next year. A large majority of you also made slight

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

upward adjustments to your headline inflation projections for 2018, and many of you also slightly increased your near-term core inflation projections. All of you now see headline and core inflation at, or modestly above, 2 percent in 2019 and 2020. Most participants continue to view three or four rate hikes this year as appropriate, with the median of your projections for the federal funds rate at the end of 2018 edging up $\frac{1}{4}$ point. The median of your projections for 2019 is also up $\frac{1}{4}$ point and implies three hikes next year. Among those who provided a value for the longer-run federal funds rate, all but two see the funds rate above that value by the end of 2020. And although your assessments of the uncertainty and balance of risks surrounding your projections are little changed overall, many of you pointed to slightly higher uncertainty or downside risks due to trade policy, and a few of you mentioned the political situation in Italy as a downside risk.

Exhibit 1 summarizes your economic projections, which are conditional on your individual assessments of appropriate monetary policy. As the top panel shows, the medians of your projections of real GDP growth this year and the next are 2.8 percent and 2.4 percent, respectively. The median drops to 2.0 percent in 2020, a touch above the median projections of longer-run growth. Most of you continue to cite fiscal policy as a driver of strong economic activity over the next couple of years. Many of you also mentioned accommodative monetary policy and financial conditions, strength in the global outlook, continued momentum in the labor market, or positive readings on business and consumer sentiment. As the second panel shows, the median of your unemployment rate projections declines to 3.6 percent at the end of this year and runs at 3.5 percent over the next two years. All of you see the unemployment rate in late 2020 running well below your longer-run estimates by anywhere between 0.5 and 1.2 percentage points.

The third and fourth panels summarize your projections of headline and core PCE price inflation. For each measure, the median of your projections moves up to or lies slightly above 2 percent by the end of 2018 and remains roughly flat through 2020. None of you forecast inflation above 2.3 percent.

Turning to the top panel of exhibit 2: Most of you marked up your projections of real GDP growth in 2018. The medians of your unemployment rate forecasts, shown in the second panel, are down 0.2 percentage point this year and 0.1 in 2019 and 2020. Some of you also lowered your estimate of the longer-run unemployment rate, but the median is unchanged. As a result of the revisions to the staff forecast and to your projections, the Tealbook forecasts of real GDP growth and unemployment are now close to the medians of your forecasts.

As the lower panels show, the medians of your forecasts of headline PCE inflation for this year and the next are up slightly from their March levels. The median of your forecasts of core PCE inflation is up a touch for this year and unchanged for subsequent years. Some of you pointed to incoming data on energy prices to explain the upward revisions. The staff, like you, expects headline and core PCE inflation to stay close to 2 percent.

Exhibit 3 reports your assessments of the appropriate path of the federal funds rate. The median of your latest projections stands at 2.4 percent at the end of this year, 3.1 percent at the end of 2019, and 3.4 percent at the end of 2020. Twelve of you see the federal funds rate rising above its longer-run level by the end of 2020. With several of you revising up your federal funds rate projections for 2018, 2019, or both, and only one of you revising down, the medians for 2018 and 2019 are both 25 basis points higher than in March, while the central tendencies in both years were roughly unchanged. Eight of you now anticipate a total of four or more hikes this year, one more participant than in March. A few of you pointed to strong labor market data as a reason to raise the near-term policy rate path. The medians of your estimates for both 2020 and the longer-run federal funds rate are unchanged relative to March.

The red diamonds in exhibit 3 show the medians of federal funds rate prescriptions derived by plugging your SEP projections of core PCE inflation and the unemployment rate, along with your assessments of the longer-run normal federal funds rate and unemployment rate, into the non-inertial Taylor (1999) rule. In light of the prominent role of the inertial version of this rule in policy discussions and the staff analysis, we are also showing the medians of the prescriptions of this rule—the green squares. In general, your individual assessments of the appropriate federal funds rate lie well below the prescriptions of either rule. The gaps between your projections and the prescriptions of the non-inertial rule are wider than those between your projections and the prescriptions using the inertial rule. Relative to March, the medians of the inertial Taylor rule prescriptions are down roughly 5 basis points this year and up 5 basis points in 2019 and 2020, while those for the non-inertial rule are up 10 to 30 basis points.

The top panels of exhibits 4.A through 4.C show the paths of the medians of your projections (the red lines) surrounded by confidence intervals derived from historical projection errors of various private and government projections. The lower-left panels of these exhibits show the distributions of your assessments of the uncertainty attached to your projections, whereas the lower-right panels summarize your assessments of the balance of risks.

Nearly all of you continue to view the uncertainty associated with your projections as broadly similar to the average of the past 20 years. Several of you mentioned trade policy and the global outlook as contributing to somewhat higher uncertainty than was the case in March. Compared with March, even more of you see the risks to your projections as broadly balanced. Specifically, for real GDP growth, only one participant views the risks as tilted to the downside, and the number of participants who view risks as tilted to the upside dropped from four to two. For the unemployment rate, the number of participants who see the risks as titled toward low readings dropped from four to two. In the case of inflation, all but one of you judge the risks to either headline or core PCE inflation as broadly balanced.

Although several of you continue to point to fiscal developments as a source of upside risk, many of you cited developments related to trade policy as posing

downside risks to your growth forecasts, and a few of you pointed to the political situation in Italy or the global outlook more generally as downside risk factors. A few of you noted that the appreciation of the dollar posed downside risks to the inflation outlook.

Your final exhibit shows a fan chart associated with the medians of your projections for the federal funds rate. The chart assigns a 70 percent probability to the federal funds rate being in a range of 1.7 to 3.1 percent at the end of 2018 and in a range of 1.2 to 5.6 percent at the end of 2020. Thank you. That concludes my prepared remarks, and I'll be happy to take questions.

CHAIRMAN POWELL. Thank you. Questions for Dan? Or comments? Tom.

MR. BARKIN. Well, it's not a question, but you were asking for comments—

CHAIRMAN POWELL. As well.

MR. BARKIN. —earlier. I'm sure they'll spend a lot of time on the four versus three, but what I took away from it, actually, is it seems to me there's a reasonable amount of narrowing in our individual forecasts regarding where we see the world going, and, directionally, we're all pretty much saying it similarly in terms of unemployment below the natural rate, inflation moving at target. I don't know whether it's doable or not, but moving the conversation toward the conviction level and, I think, away from the 15 individual forecasts—I ended up with eight–seven versus seven–eight, which feels to me a productive conversation.

CHAIRMAN POWELL. Interesting, yes. Further comments or questions? President Bullard.

MR. BULLARD. Yes, I guess I have a comment on the inflation overshoot issue. I think 2.1 is not materially different from 2.0, and that you can just say that it's nice to be talking about higher numbers, but we shouldn't get carried away about how accurately we can really measure inflation.

CHAIRMAN POWELL. Thank you. We're going to take our coffee break now, and we'll be back here, please, at a quarter of three to start the economic go-round. Thanks very much.

[Coffee break]

CHAIRMAN POWELL. Let's begin the go-round on the economy, starting with President Williams.

MR. WILLIAMS. Thank you, Mr. Chairman. And I would also like to start with adding my voice of thanks and appreciation to Bill Dudley for his service to the Federal Reserve, the 110 FOMC meetings, apparently, according to my math, on the basis of the numbers you gave, Mr. Chair, and also just my greater appreciation as the day comes closer where I will be trying to fill your big shoes.

Like Chairman Powell, I have always been in wonder of your calm demeanor, your sense of humor despite the great deal of stress in the economy and everything that has happened during your 11 years. But what I really think most of is the thought leadership—not just focused on what's happening in the markets or the economy today, but really thinking about strategy for the long term; thinking about how we should look at issues. Like Simon, I too go back to when you first joined us here at the table, as Desk manager, and how you immediately shifted the role of the Desk, to not just reporting financial conditions and talking about what's happening, but really helping the Committee think about what it means and how it fits in with what's happening in the economy and monetary policy.

Obviously, you'll be greatly missed here and at the New York Fed. I do think there is some good news, especially for you, on this. I am hopeful that you will not have as many

headaches about hearing about the Taylor rule [laughter] and I'm a little afraid r^* , too [laughter].
But, really, the best.

VICE CHAIRMAN DUDLEY. I'll have something to say about r^* tomorrow.

[Laughter]

MR. WILLIAMS. Okay. Thank you.

The economic outlook is decidedly sunny. The latest data signal a robust economic expansion. It's still gaining strength. In particular, I would like to point to one very recent data point that I find very encouraging regarding the outlook for growth. I am, of course, referring to the decisive victory by the Golden State Warriors in the NBA Finals. [Laughter]

Why, you may ask—I'm sure President Evans will—does this give me greater confidence regarding the economic outlook? Well, a careful econometric analysis, using a calculator, shows that in the year following the Warriors' championship, real GDP growth has averaged a respectable 3.3 percent. On the basis of this historical pattern and other indicators pointing to solid growth—like fiscal stimulus, an improving global economy, and favorable financial conditions—I expect real GDP to increase 2.8 percent this year, well above the pace of potential, which I still put at 1.7 percent.

Now, as a side note for those such as President Evans, who at times has questioned the methodology and conclusions of my 12th District sports-based economic analysis, rest assured that the leading experts tell me that I am highly unlikely to be in a position of touting my District's basketball team's championships in the future. [Laughter] I view the risks to this outlook as balanced as the increasing downside risk associated with a deterioration of international trade relationships is counterbalanced by risks and tailwinds driving stronger than expected growth. This year's strong economic growth comes at a time when the labor market is

already booming. Last month the unemployment rate dipped to 3.75 percent, and I see it coming down to 3.5 percent within a year. That is obviously an historic low, not seen since the 1960s.

Other indicators, including an all-time high in the job openings rate, elevated quits rates, very long average time to fill vacancies, and continued firming of wage increases confirm the labor markets are quite tight. And, consistent with these indicators, my contacts increasingly report difficulties finding qualified workers. They're coping with shortages by raising wages, offering signing bonuses, and even bringing on less-qualified workers and providing on-the-job training. They tell me they expect these moves to raise costs and to hold down near-term productivity growth.

With the unemployment rate heading for historically low levels, it's an appropriate time to reassess the estimate of the natural rate of unemployment. So my trusty staff recently revisited this issue using three different methods: a shift-share analysis, a linear regression model, and a flow rates approach. And using each of these methods we try to measure, and account for, the effect that changes in the composition of the labor force have had on the long-run unemployment rate.

Now, although the methods differ, the results are strikingly similar. Changes in the age and education structure of the labor force have shaved about 0.4 percentage point off the natural rate between 2007 and 2010. But, equally important, since 2010, there has been relatively little additional downward movement in the implied natural rate of unemployment. Moreover, on the basis of this analysis and conditional on projected future changes in the composition of the labor force, these should put little, if any, additional downward pressure on the natural rate. On the basis of this analysis, my estimate of the natural rate is 4.6 percent, and I expect this to prevail over the foreseeable future. With the unemployment rate projected to reach 3½ percent by next

year and stay there for quite some time, this does imply a very strong and, indeed, tight labor market throughout the forecast period.

Turning to inflation, we're closing in on our 2 percent goal, and with the sustained very tight labor market, I expect nominal wage growth and price inflation to pick up somewhat further, producing a modest overshooting of our 2 percent target by 2020. However, there are no signs pointing to a more rapid takeoff in inflation. Therefore, I view the risks to this inflation outlook as balanced.

With regard to appropriate monetary policy, my SEP projection is four funds rate increases this year and further increases in 2019. This is the same path I penciled in back in March and results by 2020 in a nearly 1 percentage point overshoot of the long-run nominal funds rate, which I still view to be 2½ percent, as my estimate of the neutral real rate remains at ½ percent. In my projection, this interest rate path does not produce an inversion of the yield curve, and that is reassuring, because much evidence does suggest an inverted yield curve is a pretty reliable predictor of recessions.

Now, my staff has continued to analyze this issue and confirms that this predictive power is fairly robust to including other factors such as the term premium or corporate bond risk premiums, and that it shows up in some other countries as well. And this analysis makes me uneasy with the “this time is different” arguments that dismiss out of hand the relevance of the yield curve evidence for the current situation. I do think that long-term yields provide useful information about market participants' views of future interest rates and economic conditions. So we should pay close attention to what they and other indicators of financial conditions may be telling us.

But, of course, the yield curve is not inverted at the moment, and instead, as illustrated in the alternative view box in Tealbook, the issue only comes to a head in a few years from now under the Tealbook projection. Specifically, the Tealbook has very high short-term rates relative to long-term rates, and that leads to a long period of an inverted yield curve, and that produces the high probability of a recession, using yield curve models. That said, I simply don't find the Tealbook baseline—with its very strong growth accompanied by a sharp tightening in the stance of policy—compelling. Instead, the gradual path of normalization envisioned in my projection and the median SEP appears more consistent with the medium-term outlook of relatively slow trend growth, a low neutral rate of interest, and muted inflationary pressures. I'm SEP respondent number six. Thank you.

CHAIRMAN POWELL. Thank you. President Rosengren.

MR. ROSENGREN. Thank you, Mr. Chairman. My own outlook is probably characterized best by the title of the alternative view box in the current Tealbook: “A Strong but Precarious Projection.” The data received over the past six weeks have been quite positive. Labor markets have tightened, and the unemployment rate is already where the March SEP median expected it to fall by the end of this year. In addition, momentum this quarter appears to be quite strong, and my forecast has real GDP growing much faster than potential through the rest of the year.

With the unemployment rate already at 3.8 percent and taking into account the fact that my forecasts were above potential real GDP growth, the unemployment rate will quite likely fall further. To be specific, my baseline forecast is that the unemployment rate will level off at 3.4 percent, further tightening labor markets from a starting point of already tight conditions. In my forecast, tight labor markets generate increasing wage pressures, which only partially show

through to inflation. Ultimately, the inflation rate rises gradually to a level somewhat above the Tealbook forecast. Like the Tealbook, my forecast is predicated on a higher federal funds rate than the path in the median SEP.

The last time the unemployment rate fell significantly below 4 percent for an extended period of time was in the late 1960s under Chairman Martin. At that time, the Committee was concerned about the deficit financing of fiscal expansion generated by the Vietnam War. By the end of the '60s, the Committee assumed that inflation would not pick up, in part because it expected the unemployment rate to rise. By the beginning of 1970, the unemployment rate finally began to rise back to the full-employment rate, yet the Committee's assumption about inflation proved wrong, as we experienced a steady pickup in both inflation and inflation expectations. Most historians of the Federal Reserve view this as a period of policy mistake.

Of course, this time may be different. Although the Congress has put in place an unfunded fiscal expansion at a time of very tight labor markets, labor unions today are less powerful, the economy is less susceptible to oil shocks, and, as a result, wages and prices have risen only gradually over the past three years.

We also enjoy well-anchored expectations today. However, I am suspicious that this is more a fortuitous outcome of a benign inflation environment rather than a deep foundation upon which we should rest our models of wage and price determination. Will employees continue to work for relatively stable wage increases in an environment where job openings are so plentiful and when workers know that employers are desperate for qualified talent? As fewer people lose their jobs and more consider jumping ship for higher wages elsewhere, I expect a continued gradual pickup in wages that eventually will result in higher prices. This prediction is buttressed by my forecast of an unemployment rate that lingers below 4 percent well past 2020.

Although my baseline forecast is quite positive, that does not mean I do not have important reservations. One such concern is closely related to the supply constraint scenario in the Tealbook. While that scenario implies a very low probability of a near-term recession, it is at the cost of a much higher probability of a recession in the medium term. As fiscal stimulus wanes, and perhaps turns contractionary as the growth in debt-to-GDP ratio becomes more of a concern, and monetary policy becomes more restrictive in response to rising wage and price pressures, the economy could slow down much more than intended or desirable. More generally, I do share the concerns raised in the Tealbook's alternative view box that, taking into account where we are now with the unemployment rate, the process of trying to engineer a soft landing will run the substantial risk of falling into a full-blown recession.

My second concern is more immediate in nature and is about financial fragility. In the past two weeks, there have been public announcements that Deutsche Bank is on the FDIC's list of problem banks, that S&P has cut their credit rating, and that they have had significant layoffs, particularly at their prime broker. Markets have certainly heard and understood these signals. The stock price that was trading at around \$20 earlier this year is now trading around \$11, with this decline occurring at a time when many other banks have performed much better.

It is clear why counterparties and investors are becoming concerned. In response to these pressures, which extend back a few years, Deutsche Bank raised significant capital in 2016. Despite that, the credit default swap rates for Deutsche look more like those for an Italian bank than one of Europe's preeminent and largest systematically important banks. Hence, the second risk scenario I have in mind reflects a confluence of negative factors, including political and economic problems in Italy, a further loss of confidence in Deutsche Bank, and Europe trade

issues, all occurring at a time when Europe is poorly positioned to address such problems economically or politically.

The probability that unemployment in the United States rises by 1 percentage point is 1 percent in the current Tealbook and 2 percent in the FRB/US model. I would place that tail risk noticeably higher, although still well below the probability I attach to my baseline forecast. This is an example of how supervisory and financial stability problems could have serious macroeconomic consequences. While I still view it as a relatively low probability event, we should have more discussions at future meetings about how such financial concerns should be integrated into our discussion of risks to the forecast. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President Harker.

MR. HARKER. Thank you, Mr. Chair. Let me begin by adding my thanks to Vice Chairman Dudley for his incredible service to the Fed, but also for his quiet leadership among his fellow presidents. You know, when I was a new president, everybody said, “You don’t understand the Fed unless you understand New York.” And I’m still not sure I understand New York, but [laughter]—so I asked if I could come up and spend some time. You rolled out the red carpet. You and your staff did a tremendous job of allowing me to “drink from a fire hose” to try to understand what the Desk did and what other parts of the Bank did. It was that kind of quiet leadership, never missing a beat, just saying, “I’m going to do this, it’s important to the System,” that I appreciate on behalf of myself and my fellow presidents.

So with that, over the intermeeting period, growth in the Third District has improved. Labor markets appear healthy, and consumer spending has firmed. The pace of manufacturing activity has accelerated, and we continue to hear reports of wage and price pressures. The only

sector that is not sharing in the overall economic expansion is residential real estate, although homes continue to appreciate in value.

With respect to employment, employment growth picked up in April, and the unemployment rate continued to decline. Unemployment now stands, in the Third District, at 4.6 percent. Gains in employment were broad based, both across sectors and geographically within the District. Sectors showing particular strength were manufacturing and construction, eds and meds, and professional and business services. Thus, the region's labor market is mirroring that of the nation. Additionally, we are seeing some evidence of increased pressure on wages. One staffing firm reported that jobs that previously paid \$12 to \$14 per hour are now paying \$14 to \$16 per hour, and that jobs are being filled at a relatively quick pace.

Manufacturing in the region is performing quite strongly, with the indexes on new orders and employment in our manufacturing survey at 30-year highs. The general activity index is well above its nonrecessionary average as is the future general activity index. One diversified manufacturer informed me that his order backlog for electronic components has increased from 4 to 60 weeks in a relatively short period of time. Firms appear to be relatively optimistic and have robust plans for adding more jobs.

Future capital spending plans have been substantially scaled back, however, with many of the region's manufacturers citing uncertainty over trade policy as the primary reason. Some firms have indicated that they brought forward orders of both finished goods and raw materials in anticipation of caps. As well, firms are reporting that they are successfully passing through increased prices for raw materials. But despite the price increases, demand continues to remain strong. These anecdotes are reflected more broadly in increases in both the prices paid and prices received indexes in our survey.

Retail activity has picked up as well. Our nonmanufacturing index continues to reflect moderate growth, and traffic at some of our area malls appears to be up. Although surviving brick-and-mortar stores are experiencing renewed activity, we are seeing more store closures by, for example, Sears and K-Mart in the region. As well, consumer confidence in the region remains elevated.

The only sector that has not joined this party is residential real estate. Permits for single-family homes remain flat, a phenomenon that has characterized residential construction in the District for the past three years and is broadly similar to what has occurred in the Northeast and Midwest. House prices are appreciating but at a pace that lags the nation.

Supportive of the Board staff's view that residential real estate will be weak in the near term, a builder confirms that construction workers are difficult to find, housing lots are scarce, and the costs of approvals on smaller parcels are prohibitively expensive. So in our District, and probably the nation, supply constraints will likely be a drag on residential investment.

To sum up, economic activity in the Third District is improving. Overall, in "Beige Book speak," I would characterize growth as moderate, and I anticipate much of the same for the rest of this year and next. My view on the national picture is similar to that of the Board staff. My unemployment rate does not fall quite as low as the staff projection, because I anticipate lower employment growth at the end of the forecast horizon.

The big disagreement concerns the forecast of monetary policy. I consider that appropriate monetary policy will call for a funds rate that will only slightly exceed its long-run neutral rate of 3 percent in 2020. Thus, I don't contemplate an inversion of the yield curve. That would, in my view, constitute an unduly risky stance for policy.

As was the case with President Williams, work by my staff strongly supports the material in the alternative-view box contributed by David Miller and complements his analysis. For example, we estimated a series of probit models using pseudo maximum likelihood techniques. We find that the spread between the 10-year rate on Treasuries and the 3-month bond equivalent Treasury rate has significant out-of-sample predictive content for the onset of recessions at four- and six-quarter horizons. Additionally, the probability of a recession for any particular term spread depends on the level of the funds rate. The higher the funds rate, the more likely is recession for any given value of the term spread. For example, conditional on the funds rate and term spread predicted in the Tealbook as of the fourth quarter of 2020, the probability of a recession occurring within four quarters is 39 percent in one of our preferred models and 50 percent in another. With respect to a recession occurring within six quarters, those probabilities increase to 54 percent and 70 percent, respectively.

All of these numbers exceed the unconditional probability of a recession occurring sometime during the next four or six quarters. Therefore, we in Philadelphia draw a similar conclusion to David's that the forecasts in the Tealbook seem to be internally inconsistent. But as a policymaker, I take away the added lesson that an appropriate policy rate path that strives to be robust—say, in the sense of Hansen and Sargent—should avoid yield curve inversions.

Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President Bullard.

MR. BULLARD. Thank you, Mr. Chairman. It seems clear on the basis of both national economic statistics, and extensive District contact information, that the U.S. economy is in a very good state as of today—what President Williams just called “sunny.” Or was that the afterglow of the Golden State Warriors' victory? I'm not sure.

MR. WILLIAMS. Both.

MR. BULLARD. Both. [Laughter] Accordingly, I plan to direct my comments today mostly toward my interpretation of macroeconomic events and on the strategy of the Committee as we go forward. In short, we are in a good state today, but will we be in a good state over the forecast horizon?

Economic growth certainly looks relatively robust, but it is important to note that the current growth spurt is expected to be temporary. Nearly all forecasters have growth slowing in 2019 and 2020 from this year. It's far from clear that we need to respond permanently to what is expected to be a temporary growth phenomenon. In the past, when growth has slowed temporarily, the Committee has often looked through such transitory movements.

Of course, coupled with relatively strong growth in real GDP, we also have continuing strong labor market performance. This is often discussed here as if this signals meaningful upward pressure on inflation outcomes. However, the feedback from labor market performance to inflation has been, empirically speaking, very weak for most of the past two decades or more.

We saw an example of how flat the Phillips curve is in the recent special memo addressed to the Committee concerning President Barkin's request that the staff prepare an analysis of how the forecast would change if monetary policy was assumed to follow current market-based expectations, which tend to be more "dovish," as opposed to the baseline staff assumption, which has been more "hawkish" than the market. The central finding was that unemployment would move several tenths lower than the baseline, but that inflation would essentially be unchanged. Most people would consider that a better outcome over the forecast horizon. Some very good things might happen in such a scenario, including pulling African American and Hispanic unemployment rates lower and closer to societal norms.

Some might suggest that a more “dovish” path ahead, such as the one suggested in the memo prepared for President Barkin, would cause the Committee to get “behind the curve.” And it is certainly not apparent in that particular simulation. But I think it is important to emphasize that the Committee has already been preemptive in getting to the good situation we are in today. In the past few years, inflation has consistently been below target, but the Committee nevertheless began to normalize by moving the policy rate off the near-zero levels and beginning to reduce the size of the balance sheet in a gradual and predictable manner.

That the Committee’s preemptive behavior has paid off can be seen in market-based measures of inflation expectations, which remain around 2 percent on a five-year basis and also on a five-year, five-year-forward basis. These expectations are for headline CPI. After adjusting somewhat, let’s say by subtracting 30 basis points to translate to PCE inflation, we get the suggestion that the market thinks the Committee will continue to undershoot its inflation target over the next decade. I realize that one could make other adjustments to these data, such as for inflation risk premiums as well.

These expectations make sense to me in that, if we look at actual inflation measured by the Dallas Fed trimmed mean rate year over year, that’s 1.7 percent today. So the market is really not saying that we’re going to see a lot of inflation pressure ahead.

I like the market-based measures of inflation expectations because they contain all available information as participants place their bets on future inflation outcomes. In particular, market participants are aware of the temporarily booming economy, tight labor markets, and recent changes in fiscal policy, all of which are priced in. The market also prices in an expectation regarding future monetary policy, but that expectation is generally more “dovish” than the Committee’s.

But despite having already priced in all of these developments, plus a more dovish outlook for Committee policy, the market judgment is that the Committee will miss its inflation target on the low side in the years ahead. How could this be, in view of the fact that the policy rate, even today, seems to be at a very low level? The answer is that it does not take much to create a restrictive monetary policy in today's global interest rate environment.

I'd encourage the Committee to keep in mind that the Bank of Japan and the ECB still have negative policy rates and are still buying assets. The real safe short-term interest rate is still very low globally. The neutral level of that rate, best defined as the trend component, remains negative today. If we add 2 percent to that negative level, we may conclude that the neutral level of the nominal federal funds rate is around 175 basis points, very close to where we are today. Moreover, I think it is unwise to predict mean reversion in the real safe rate, as that rate is the culmination of 30 years or more of developments in longer-term fundamental factors. Better to assume no change in the real safe trend rate over the forecast horizon.

Increasing the policy rate from here would, in my view, be moving toward a restrictive policy stance and coupled with balance sheet reduction, which is a tighter monetary policy. Because there is little indication of inflationary pressure currently, I would interpret this as the Committee betting on a nonlinear Phillips curve. I see very little evidence of such nonlinear effects.

Finally, we have yield curve inversion lurking for the U.S. economy. I have several remarks on this issue. First of all, the curve is not inverted today, so recession probabilities remain low today. If the curve does invert later this year or in the first half of 2019, recession probabilities will rise, but even then recession would be sometime in the future. Related to this topic, I liked the Tealbook's box on the precarious projection.

Second, we are the cause of the flattening yield curve. We do not need to push normalization so hard as to invert the yield curve with inflation as low as it is today.

Third, some say that the yield curve will not invert because the 10-year yield will increase, which I think is a perfectly reasonable position to take. I think this is fine, but we need 25 basis points a quarter at the current pace of policy normalization. And, generally speaking, we have not been getting this in recent market performance. So I would see further flattening as we continue to push harder on the normalization agenda.

Fourth, some say that we may get an inversion, but that it would not be a significant development. Effectively, they'd be saying, "this time is different." Along with President Williams, I am uneasy in taking this type of interpretation. As a staff person, I was burned both in 2000 and 2007 when arguments were made around the Federal Reserve to ignore yield curve arguments. We were wrong both times, and, in the second case, we had a very serious downturn. The view that this time is different ignores the strength of the empirical record in the United States, which is quite strong.

A variant of this argument that this time is different is that yield curve inversion can occur, but it's not causal for recessions. I do not find this argument persuasive, either. In my view, recessions are caused by shocks, and it's simply implausible that recessionary shocks just happened to occur right after the yield curve inverted during the U.S. postwar era.

Fifth, some say quantitative easing has depressed term premiums—let's say, 80 basis points—so that the yield curve is steeper than it otherwise appears. I do not think this is the right view for policy purposes either. The leading theory of quantitative easing is that it is a signal. While assets are being purchased by the monetary authority, the policymaker is unlikely to raise the policy rate. So quantitative easing was a way to promise "lower for longer." Once the

purchasing stops and the policy rate begins to rise, there is no longer any signal coming from the size of the balance sheet.

Longer-term yields, therefore, mostly reflect growth in inflation fundamentals for the period ahead and not lingering effects of quantitative easing. In any event, a term premium effect would presumably be fading, even if it existed, over the life of a 10-year Treasury bond, as the balance sheet is expected to return to normal in the early part of the 10-year window.

Therefore, pricing effects today should be relatively small and falling. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President Barkin.

MR. BARKIN. Thank you, Mr. Chair. Over the past six weeks, the economy happily has evolved about as we expected. GDP has been strong, with the pickup in consumption that we had forecast. Labor markets have continued to tighten, and inflation has stayed firm. I am still new, but I imagine we don't always forecast this well. [Laughter]

The Fifth District sees the same strength. Bank loan pipelines are strong. Commercial construction is booming. We expect continued growth through the second half of the year. Consistent with the Tealbook, our contacts are beginning to report late-cycle productivity challenges and supply constraints.

Against that background, I might note four thoughts. First, like others around the table, I see the international situation as representing downside risks that are sizable but with relatively low likelihood. Of course, it is unclear how the tariff situation will develop, but I did want to say, that in my view, the back-and-forth over what will and won't be applied has already sabotaged its intended purpose: Very few businesspeople will invest in new onshore jobs in targeted industries, given the uncertainty about how long any tariff regime will be sustained. We

hear that from our steel and aluminum contacts, for example, who report that they certainly expect higher prices as a result of the tariffs but don't plan any new investments to increase capacity.

Second, I am still watching turnover closely. As I said last time, I see attrition as a more important factor than the unemployment rate in generating what we call wage pressures. Turnover has been creeping up, but, according to our contacts, it has not yet capitulated, apart from skilled construction workers, truck drivers, and certain technology companies. The Atlanta Fed wage tracker for continually employed workers shows increases of 3 percent. In the mid-2000s, that was 4 percent. In the late '90s, that was 5 percent. This correlates to the quit rates, which have only just now reached levels seen in the mid-2000s and are even lower than their late '90s equivalent.

What explains a turnover rate that is unusually low relative to the tightness of the hiring market? It may be there is just some hangover from the Great Recession, with many workers still reluctant to quit jobs they like for a moderate increase in compensation. And the San Francisco Fed has published an interesting piece that points to a reduction in the job-to-job transformation rate for 16-to-24 year olds. I note the author of that piece is here today.

Third, regarding the yield curve, the markets know and we know that yield curve inversions have become a fairly reliable predictor of recessions. However, I found the Tealbook box compelling and hope we'll start tracking that first quarter–fifth quarter spread as well. More broadly, I have, at least, incorporated into my thinking the fact that the yield curve is now just structurally flatter than its historical average. The term premium has been trending lower for many years, long-term inflation expectations are lower and more stable, and the marketplace,

including us, has a high demand for longer-term safe assets. All that means is that we should just take a more holistic view of what we learned from the yield curve as the Tealbook suggests.

And, finally, for the SEP, my own projections have changed little since March. Growth and inflation are comparable to the Tealbook, with slightly higher unemployment, as I continue to imagine we'll see a bit more productivity growth than some of you expect. I greatly appreciated the exercise that was conducted, looking at the implications of the median SEP path. I do think it's important for us to understand the staff's assessment of the economic effects of our submissions on a continual basis. If I take those results at face value, it's reassuring, given the economic strength assumed in the Tealbook, that the model doesn't project that our potential path unleashes more inflation. And, of course, that was my concern. Thank you.

CHAIRMAN POWELL. Thank you. President Mester.

MS. MESTER. Thank you, Mr. Chair. Overall, incoming data and information from business contacts points to continued expansion of the Fourth District, with the largest change since our previous meeting on the inflation front.

In June, the Cleveland Fed staff diffusion index of economic conditions measuring the percentage of business contacts reporting better versus worse conditions improved to 44, the highest reading since 2014. Average readings this year are about 10 points higher than the second half of last year, consistent with continued strengthening.

District labor market conditions remain strong. Year-over-year payrolls continue to expand at a 1 percent pace, which is well above trend. The District's unemployment rate has fallen 0.4 percentage point so far this year. At 4.4 percent, it's at its lowest level since 2001, and it is nearly 1 percentage point below the Cleveland staff's estimate of the District's natural rate

of unemployment. Also, the Cleveland staff diffusion index of hiring reached its highest level in its near four-year history. Wage pressures in the District continue to rise.

Business sentiment remains largely upbeat, with almost one-half of our Beige Book contacts expecting economic conditions to strengthen over the next several months. Nonetheless, contacts did express some concerns about trade developments and geopolitical tensions. In response to a special Cleveland staff survey, about one-third of firms indicated that uncertainty associated with trade negotiations, including NAFTA, and geopolitical developments were having a negative effect on their firms. One-fourth reported their customers have changed plans because of the uncertainty.

For example, a director from the auto industry indicated that firms with cross-country supply chains were reluctant to invest in new or existing plants for the time being. An auto parts supplier reported that his customers are looking for alternatives to steel. A major multinational manufacturer of industrial and electrical equipment reported that current conditions remain strong, but that uncertainty about the cost of certain inputs had caused it to modestly scale back its planned investment. Of course, in all things there are winners and losers. Steel makers reported gains due to increased prices, and a consulting firm is enjoying increased demand for its services driven by the uncertainty.

Inflation pressures in the District are building. The Cleveland staff diffusion index for nonlabor input costs rose to its highest level since it started in 2014. More than two-thirds of our Beige Book contacts reported rising input costs. District firms are raising their own prices in response to these higher costs and in the face of stronger demand. The staff's diffusion index for prices received also rose to its highest level in its four-year history. More than one-half of our Beige Book contacts reported raising their prices. More firms across a range of sectors tell us

they're finding little resistance on the part of their customers to these higher prices. And this is true even in the very competitive retail sector, which has found it very difficult to raise prices in the past.

For the national economy, the narrative of my forecast is similar to that in March. But on the basis of incoming information, I've edged up my growth and inflation forecast and edged down my unemployment rate forecast over the projection horizon. My associated funds rate path is slightly steeper than in my March projection. Over the forecast horizon, I expect growth to be above its longer-run trend, which I estimate at 2 percent, and the unemployment rate to fall further and remain below its longer-run level, which I estimate at 4½ percent. I expect inflation to be sustainably at 2 percent by the end of this year and to remain there over the rest of the forecast horizon.

Economic fundamentals remain healthy. Personal incomes are rising, and household balance sheets are healthy. Monetary policy and financial conditions remain accommodative. Fiscal policy will add to growth through the forecast horizon. As anticipated, the first quarter slowdown in consumer spending was temporary, and real GDP growth appears to have strengthened in the second quarter. I expect real GDP to grow between 2½ and 2¾ percent this year and next.

Labor markets have tightened further since the last FOMC meeting, and a range of indicators show the economy is operating beyond maximum employment. Payroll gains were well above trend. Monthly gains this year have averaged over 200,000 jobs, up from an average of 180,000 last year.

The unemployment rate, at 3.8 percent, is at its lowest level in 18 years. The current level of the unemployment rate is 80 basis points below the CBO's time-varying estimate of the

natural rate of unemployment. Analysis by the Cleveland Federal Reserve staff shows that this unemployment gap is larger than we saw at any point during the expansions of 1982 to 1990 and 2001 to 2007, and is nearly as large as we saw in the 1991–2001 expansion.

With growth above trend over the next couple of years, the economy is poised to operate beyond maximum employment. Wages and broader compensation are beginning to accelerate, though low productivity growth is likely to temper the pace of inflation. But inflation continues to firm, with year-over-year total PCE inflation at 2 percent, and core PCE inflation is 1.8 percent in both March and April. Longer-run inflation expectations are stable.

I thank the Board staff for the work they're doing to expand our understanding of how inflation expectations are formed as discussed in the Tealbook. In view of the importance of expectations for inflation forecasting, I'm looking forward to gaining more insights from this important work. For now, with above-trend real GDP growth continuing and stable long-run inflation expectations, I am projecting inflation to be near 2 percent over the forecast horizon, and by the end of the year, I expect to be able to say it's been sustainably at our goal. In my March projection, I thought we wouldn't get there until the first half of next year.

I view the risks to my forecast as broadly balanced. Fiscal policy poses an upside risk to my projections over the forecast horizon. Trade policy is a downside risk, which could grow over time. The outlook for foreign economies remains sound, but downside risks have risen in the euro area, associated with the political situation in Italy, and financial stresses have increased in some emerging market economies that face large current account deficits and external debt burdens.

Some of these developments have supported recent dollar appreciation. If the appreciation were to intensify and be sustained, this could lower real GDP growth and inflation

in the United States. But, for now, I see inflation risk as roughly balanced. Of course, this is contingent on a path of increasing policy rates. Indeed, my outlook and assessment of risk suggest that it's appropriate for the FOMC to continue on its path of gradually raising the federal funds rate.

My associated funds rate path is slightly steeper than in my March projection, but I would still characterize it as a gradual path, given the strength in the economy. Over the next year, my path is similar to the median path obtained from the set of simple monetary policy rules across several forecasts that are available on the Cleveland Fed's website.

The current real federal funds rate is negative, and it's below the range of estimates of the neutral rate, regardless of whether we are referring to the short-run, medium-run, or long-run neutral rate. Despite the uncertainty associated with these estimates, with the economy expected to move further beyond full employment and with inflation near 2 percent and expected to be sustainably at our goal by year-end and over the rest of the forecast horizon, the case for continuing to decrease the level of accommodation is very compelling.

With estimates of the short-run neutral rate expected to rise over time, if we don't continue to raise the policy rate, we'll fall further behind. In the current environment, I think there is more risk that we'll move rates up too slowly than too quickly. Indeed, the Tealbook provides some very useful alternative scenarios that help us think through the risks. Across all but one of these scenarios, the policy prescription entails a rising policy rate path. This is true even in the scenarios entailing global risk. The exception is the scenario with the domestic recession triggered by a sharp correction in asset valuations, suggesting that that's a situation to avoid to the extent possible. This again argues for continuing to move monetary policy toward a neutral stance, especially as we do see signs that asset valuations are elevated.

I also found the alternative view box in the Tealbook to be a very useful reminder that soft landings are exceedingly difficult to achieve. Regarding the Great Recession, the recession indicator model described in the Tealbook—which includes term spreads, the term premium, credit spreads, and output gaps—began to show elevated recession risks starting in 2006. But by then, it was too late to prevent it using monetary policy. The lesson I take from this is that we cannot become complacent. The risk of running an overheated economy are high, and, as history shows, having to play catch-up with policy does not result in good outcomes. Thank you, Mr. Chair.

CHAIRMAN POWELL. Thank you. President Evans.

MR. EVANS. Thank you, Mr. Chairman. And thanks to Bill Dudley. Vice Chairman Dudley has always contributed outstanding monetary policy thought leadership, and our FOMC decisions have been better because of that. I know I've always taken those on board very carefully. But I have to say, I'm particularly impressed at how in New York he's been tough as nails. I don't know how else you can describe a New York Fed president who roots unabashedly for the Boston Red Sox. [Laughter] President Williams, there's hope for your teams too, perhaps. [Laughter]

All right. Having said all of that, the reports of my directors and other contacts again pointed to strong growth and solidifying inflation trends. Almost every manufacturer I spoke with reported robust demand. And consumer-facing businesses, like the automakers and Discover Financial, also had positive news to report. On the downside, there was a significant intensification of complaints about the uncertain business environment caused by U.S. trade policy, and others have reported on that already. Several large manufacturers were quite vocal in their concerns over the negative effects of further increases in tariffs or a collapse of NAFTA.

They also said that uncertainty over possible outcomes is weighing on an otherwise healthy investment environment.

Since they don't know what the rules will be, it's hard to know where to invest, which can lead to a paralysis. For example, General Motors told us that they were delaying any major capital spending decision that they could. Of course, the current strong investment data largely reflect commitments made in the past. So I asked my directors how long they thought it would take for a continuation of this skittishness to put a dent in the robust capital spending we've been seeing. A couple of them ventured a guess that it could start to show up in the hard numbers by the end of the year.

Our financial market contacts with macro-oriented investment strategies also were concerned about the somewhat softer outlook for foreign economic growth and the potential risks associated with the Italian political situation, but even though these contacts were somewhat less sanguine than before, they were not expecting any major effect on the U.S. economy unless matters in Italy deteriorated to a point of posing a serious risk to the euro.

With regard to wages and prices, the comments I heard this time were largely similar to last round, though with perhaps some incremental increase in the strength and breadth of the reports of building pressures. At least a few more businesses seemed to be willing to follow the Econ 101 script and increase wages to attract and retain workers.

For the national outlook, our views on growth haven't changed much. We still have real GDP increasing 3 percent in 2018 and then slowing to a bit under 2 percent by 2020. Like President Williams, we did make a couple of modest changes to the supply side of our forecast. My staff's research on the effects of the increased educational attainment of the workforce led us to take onboard a lower estimate of the long-run unemployment rate, going from 4½ percent to

4.3 percent. We also took a more careful look at how the robust investment numbers we have in our forecast would influence capital deepening. In the end, we boosted our forecast of potential output growth a bit over the projection period. By 2020, we now see potential GDP growing a little faster than 2 percent. Some of the investment in capital deepening will be transitory, and we still see long-run growth settling in at 1.8 percent. All in all, our revisions to actual real GDP growth, the natural rate of unemployment, and potential output leave us with slightly less resource pressure in our current forecast than we had in our March SEP.

I think the risks to our growth forecast are broadly balanced. We've had some upside surprises lately, and we could be underestimating the underlying momentum in the domestic economy. And some simple vector autoregression analysis we've done suggests the impulse coming from fiscal policy might be stronger than we have assumed ourselves previously. On the other hand, our forecast does not include any effect due to changes in tariffs or other trade policies. Moreover, given what I heard about business sentiment, I see some downside risks to the robust investment rates—more than what we have in our projection.

As for inflation, the recent data have come in about as we expected, so that's good news for our forecast. And there are some other reasons to feel more comfortable about the inflation outlook. Commentary given by my business contacts seems consistent with a more firmly established inflation environment, and the underlying inflation trend estimated in our Chicago bank DSGE model picked up a bit, in response to the most recent configuration of the data. The model seems to interpret a configuration of positive shocks that are helping with underlying inflation trends. However, it's possible that the model's revision simply reflects some kind of a transitory shock. There's a lot of uncertainty regarding that as opposed to a more fundamental firming in the inflation expectations trend. So it's too early to tell, but that is good news.

Furthermore, many survey measures of inflation expectations have not budged off their lows, and the nice recovery we have been seeing in TIPS breakevens appears to have stalled somewhat recently. So while we've made good progress, I still think policy has a little more work to do to anchor inflation expectations symmetrically around 2 percent.

My forecast has monetary policy gradually moving to a slightly restrictive stance by late 2019. The appropriateness of this setting is conditional on inflation trends and expectations firming to a point that's consistent with the achievement of our symmetric inflation objective. I think sticking to a gradual path of rate increases in the midst of solidifying inflation data will help us reach this necessary goal. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Mr. Chairman. I first want to congratulate Bill Dudley for his tremendous leadership and a job well done at the Fed, generally, and at the New York Fed, specifically. I've known Bill for close to 30 years now, and I've felt very privileged to have a chance to work with him here at the Fed and learn from him regularly. He has been a great friend and adviser and coach, and I just want to thank Bill for all he has done for the country and for the Fed.

The 11th District economy remains strong and continues to expand at a very solid pace. Our surveys suggest that economic activity actually accelerated in May. This acceleration was primarily due to improvements in energy, manufacturing, and construction industries. Texas added jobs at a 3.8 percent rate year-to-date, and we expect job growth in the State of Texas in 2018 to be 3½ percent despite tight labor markets and numerous reports of labor shortages. Our surveys and discussions with our contacts, in particular, suggest building wage pressures for workers in oil field production service as well as in construction and leisure and hospitality

industries. Our survey wage indexes are well above historical averages. Labor shortages and uncertainty regarding trade are certainly two key downside risks to economic growth in the 11th District.

Just a comment on energy: The industry is booming. Our economists and our industry contacts expect crude oil production this year to increase in excess of 1 million barrels a day in the United States. Crude oil production in the United States now stands at 10.7 million barrels a day. We expect to end the year in excess of 11¼ million barrels, and I will say, this compares with 5 million barrels a day of crude oil production in the United States in 2008. So we have really substantially ramped up. By comparison, Saudi Arabia crude oil production is right now 9.9 million barrels a day, and Russian production is approximately 11 million barrels a day.

On the supply–demand side in the United States—and I note the Tealbook box about the effect of rising energy prices—part of the talk is the increasing self-sufficiency of the United States. And to that point, it is our estimate that the United States will consume approximately 20.6 million barrels a day of oil and other petroleum products in 2018. On the supply side, we estimate, as I mentioned, 11¼ million of crude oil production, another 4½ million barrels of natural gas liquids, and another 1.2 million barrels per day from biofuels production, which is obviously a rapidly growing area. Now, these supply–demand numbers are not perfectly apples-to-apples because different products are refined and processed into different outputs, but you get a sense of the growing energy independence in the United States.

When you add these numbers up, U.S. oil production represents roughly 80 percent of U.S. consumption right now versus approximately 40 percent in 2008—and I'll talk about this in a moment, because we are concerned about a shock in price to the upside—but because of our increasing energy independence in the United States, this will mute that shock. We still believe

that the Permian Basin is producing approximately 70 percent of incremental supply in the United States, but labor supply constraints, infrastructure constraints, and other physical constraints have become much more binding. Because of this, we think fields outside the Permian, such as the Eagle Ford in South Texas and the Bakken in North Dakota and Montana, are growing and should grow even more.

We also note that we saw a spike in oil prices since the previous meeting, and then they came back down. Part of this was due to potential production declines in Iran and actual declines in Venezuela. The decline was also due to discussions by Saudi Arabia and Russia signaling the possibility of production increases. It's our best judgment that, in the June OPEC meeting, OPEC will announce a 500,000 barrel-a-day increase in production. So they will restore some of their cut. On the other hand, we think this will be just enough to offset the estimated production losses on the part of Venezuela and Iran. So we still think we're roughly in global oil supply–demand balance, despite these different changes, including what OPEC might do.

As we've said before, we still believe that by 2020 or 2021 we will see a real likelihood of a global undersupply situation, particularly assuming global demand growth of 1 to 1½ million barrels a day. Shale is going to grow substantially in the United States. For example, the Permian Basin now generates about 3 million barrels a day. We think that's going to get to 8 million barrels a day over the next 17 years or so, but given the rapid decline characteristics of shale and the lack of long-lived projects, we still think shale is not going to be able to keep up with global demand. We agree with the box in the Tealbook—last comment on energy—that it should be manageable unless the spike is very rapid, in which case it won't be offset very quickly by increased cap-ex. And we also would note, because of the regional concentration of the energy business and the cap-ex, you are going to have 45 states, basically, that are being hurt

by an oil price spike and a small number that are being helped. And it's our view that this spike is likely coming, and we are much more vulnerable to it now—and we'll get more vulnerable in the next couple of years., depending on what else is going on with regard to economic conditions in the United States. We note this because it could come at a very inopportune time, when fiscal stimulus is fading and in light of all the other parts of our projection.

Regarding our own projections for the United States, we continue to estimate real GDP growth in the United States of 2¾ percent in 2018. This is a modest firming in our outlook since the previous FOMC meeting and the previous SEP exercise. We continue to expect—like most of you—growth to slow in '19 and '20 as fiscal stimulus fades and monetary policy accommodation is removed. We continue to expect the unemployment rate to decline to 3.6 percent in 2018. Regarding inflation, we would note, as was mentioned earlier, there were revisions to the BEA's numbers in their May 31 release, which took 0.1 percentage point off 12-month core and the Dallas trimmed mean. So that's the reason the Dallas trimmed mean inflation number is now running at 1.7 percent. It was 1.8, and we still think the core PCE inflation is running at 1.8 percent. Having said all of that, it is our estimate that the Dallas trimmed mean is going to rise to above 2 percent by either the end of this year or early 2019.

One other comment. We did a technology-enabled disruption conference in Dallas, which we cohosted with the Atlanta Fed. It brought together a very diverse set of contributors. We were very fortunate to have a number of Fed presidents there, business executives, educators, academics, and various members and leaders in the Fed research staff and research directors, which made this a very valuable conference. What we learned from this and what was discussed is, technology-enabled disruption has been with us for decades, but the advent of the cloud and distributed computing power and the power of technology now in the hands of consumers has

accelerated the rate of change and is limiting the pricing power of businesses much more than in these cycles of the past. Many business leaders across a range of industries discussed their plans to take further steps to replace people with technology and described the changing skills needs and changing composition of their workforces. Many discussed the need to adapt to technology-enabled disruption now as a matter of survival, and noted the need for greater scaling and cost cutting in order to adapt to this challenge. There was a lot of discussion about the fact that ongoing technological change is not necessarily inconsistent with a low measured aggregate productivity growth. And a number of academics talked about the fact that it is not unusual to observe substantial lags in effects, and they are still hopeful that with improvements, aggregate productivity could well catch up to technology-enabled disruption, and that having a lag like we might be experiencing now would not be a surprise. The jury's out on that.

The last comment is, I think I was most struck by the discussion of education. In particular, the United States is lagging in terms of early childhood literacy, the percentage of third graders who read at grade level, the percentage of high school graduates who are college ready, the lagging percentage of college attendees who are graduating within six years, and meeting the need for beefing up skills training at high schools and junior colleges. Many spoke about the role of poverty among at-risk groups as helping to explain these lagging statistics, but, in particular, the race between a very nimble business community, which can adapt and innovate very quickly, and a public education system that has deeply imbedded design factors which keep it from adapting at anywhere near the level and rate needed to keep up with changes in business. This is an issue at the city, state, and federal levels for policymakers as we look for ways to grow GDP in the United States in the years ahead. I'm glad we're going to pick up this topic and talk

more about it at the Jackson Hole conference, and we'll obviously continue to keep working on this subject. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. Governor Brainard.

MS. BRAINARD. Thank you. Incoming data suggest strong growth for the remainder of the year after some softness in the first quarter. Real GDP growth should receive a boost as substantial fiscal stimulus comes online over the next two years, leading resource utilization to tighten further. With a tight labor market and inflation near target, the stimulus in the pipeline suggests some risk to the upside, while international developments suggest some risk to the downside. I'll touch on each in turn.

The latest data suggest consumer spending growth has bounced back after a soft first quarter, and strong fundamentals should support that momentum in the period ahead. Strong employment conditions and tax cuts should provide an offset to the increase consumers are facing in prices at the pump. Furthermore, business fixed investment is currently estimated to have increased at a robust pace of 6 percent at an annual rate, and it's likely to receive support from the increase in oil prices, as we just heard. Separately, as others have noted, tax and trade policy may be exerting countervailing influences on cap-ex.

The latest data also suggest that net exports will make a positive contribution in the current quarter, adding almost $\frac{1}{2}$ percentage point to real GDP growth, after being a neutral factor in the first quarter. With ample fiscal stimulus in train, it's likely that growth will continue above the trend rate over the next few years. A variety of estimates suggest fiscal impetus will contribute about $\frac{3}{4}$ percentage point to GDP growth this year and next, although there is substantial uncertainty about the fiscal trajectory starting in 2020.

While the global economy grew in sync last year, more recently the picture has become more varied. Political developments in Italy have reintroduced euro-area risk, and financial conditions in the euro area have worsened somewhat in response. But in my discussions with market participants, the outsized moves were attributed by them more to technical factors and positioning than they were to fundamental unease about redenomination risk. With some uptick in political uncertainty, growth in the euro area and Japan somewhat less rapid than in 2017, and inflation still below target in these two economic areas, monetary policies among the advanced economies look likely to be divergent. This, in turn, suggests continued strengthening of the dollar. An environment with a strengthening dollar, rising energy prices, and higher interest rates in the United States raise the risks of capital flow reversals in some emerging markets. So far, stresses have been contained to a few vulnerable countries, but the risk of a broader pullback bears watching. In addition, the incoherence and unpredictability of trade policy clouds the horizon. A further escalation in measures and countermeasures could prove disruptive at home as well as abroad.

Changes in financial conditions have been mixed since we last met. Although yields are little changed on net, equity prices are up about 5 percent since the May meeting—which is a positive sign for the economy. At the same time, the dollar has appreciated, a drag both on net exports and core import prices. Over the intermeeting period, the net effects of these forces is likely to be about a wash. But, taking a step back and considering a longer period: the case is somewhat stronger that some net tightening in conditions has occurred since the beginning of the year. And, importantly, the 10-year Treasury yield is up about 50 basis points since the start of the year.

The latest readings on the labor market have been very strong. Payroll employment, which rose 223,000 in April, is now averaging 200,000 per month this year. That is a step-up from the already strong 2017 pace and more than sufficient to keep the unemployment rate moving down. In fact, the unemployment rate has moved down somewhat more rapidly than I had projected, moving down after remaining flat at about 4.1 percent for six consecutive months. It has registered two consecutive declines and now stands at 3.8 percent. If it falls another tenth, which is likely to happen in the next few months, it will be at its lowest level since 1969.

The gains in the labor market have been widespread, with the unemployment rate for African Americans dropping in May to 5.9 percent, another record low for the series, which began in 1972. Over the past year, the prime-age employment-to-population ratio has moved up markedly to 79.2 percent in May, up from 78.4 percent a year earlier. That's a welcome development, but it still remains about 1 percentage point below its pre-crisis peak.

The United States is an outlier in the failure of the labor force participation rate for prime-age workers to recover to pre-crisis levels. Other advanced economies have seen either stability or an increase in the participation rate. It's an open question in my mind how many prime-age Americans are likely to be drawn back into the labor market by the tighter conditions that we're seeing. Although it is difficult to know with any precision how much slack still remains, I am seeing more evidence that wages are accelerating, although at a measured pace. We have now seen average hourly earnings rising 2.7 percent over the 12 months through May, a bit higher than over the preceding two years, and that same pattern is true for the ECI, which was up 2.8 percent in the first quarter over the previous year—up from 2.3 percent over the previous period in 2017 and 1.8 percent the year before that. For purposes of comparison, in the years leading up to the crisis, the ECI rose a bit more than 3 percent at an annual rate, while core PCE

was around 2¼ percent. I am also, like many of you, hearing anecdotes relating labor market shortages in specific occupations and sectors, echoing a theme that was prominent in our recent Beige Book surveys.

For inflation, the latest readings have been very encouraging. With the May CPI data that were released this morning in hand, the Board staff now estimate that core PCE prices rose 1.9 percent over the latest 12 months. That's up from 1.5 percent a year earlier. And overall PCE prices increased about 2.2 percent over the 12 months through May. Other measures of core inflation, as was just referenced, such as the Dallas Fed trimmed mean, suggest inflation is still running a bit below our target. And, of course, with recent research highlighting the downside risks to inflation and underlying trend inflation that are posed by the effective lower bound on nominal interest rates, it underscores the importance of ensuring underlying inflation doesn't slip below target. In that regard, if we were to see a mild temporary overshoot, this could well be consistent with the symmetry of our target and may help reanchor underlying inflation at target. It is reassuring to see core PCE inflation moving back to target, along with market-based measures of inflation compensation retracing earlier declines. After seven years of below-target inflation, it will be important to see inflation around target on a sustained basis to be confident that underlying trend inflation is running at 2 percent.

Finally, I also want to express my admiration for Bill Dudley. Bill "The Market Whisperer" Dudley [laughter] has an uncanny talent for translating "Fedspeak" into "market speak" and the reverse. Because he is someone steeped in the intricate interactions of financial markets and monetary policy, we all have relied on Bill for his keen insights on how policy actions might be interpreted by market participants and, in turn, how markets are positioned. The FOMC, and the country more broadly, have benefited immeasurably from his vast

knowledge, sound judgment, and perhaps most importantly, his willingness to take action at the most challenging moments. Thank you.

CHAIRMAN POWELL. Thank you. Governor Quarles.

MR. QUARLES. Thank you, Mr. Chairman. Let me start with some remarks about Bill. I did not, unlike many on the Committee, know Bill before I arrived except from his public statements. And I had come, before knowing him, to have a huge appreciation for the quality of his thinking, or what President Williams called his thought leadership. That was clearly grounded in a deep understanding of markets, as well as of the economy—which is rarer than one would sometimes imagine. And then when I was first nominated for this post, Bill, you were the first of my new colleagues to reach out to me, to attempt to begin teaching me—other than Jay. And throughout our service, your patient and insightful discussions have taught me an enormous amount—about the substance of our work, about the idiosyncrasies of the Fed, and about the qualities of a leader. So as a colleague, I want to thank you for what has been, if too brief for me, an enormous personal and professional pleasure. And as a citizen, I want to thank you for your very significant contributions to our country.

VICE CHAIRMAN DUDLEY. Thank you.

MR. QUARLES. My outlook isn't much changed from when we last met—for that matter from the March SEP, for that matter from a few SEPs before that—because I have long been an optimist among this happy band, and the world is catching up. [Laughter] I remain optimistic about the country's growth prospects, both in the near term and in the long run, notwithstanding some increased risk coming from overseas, uncertainty about trade policy. But as Brother Kamin noted in his briefing at the outset of our meeting, not much of that is actually currently showing up in the data. The fiscal boost coming from the tax act will provide strong

support for growth both by boosting demand over the next year or so, and also by spurring investment and potentially increasing labor force participation, pushing out the productive frontier of the economy.

I can't remember how often I have bored people here with this, but I am a bit of a techno-optimist, picking up a bit on some of President Trump's remarks. There is not an ineluctably compelling explanation for the slowdown in productivity growth over the previous decade. Nonetheless, when you look at the types of technological advances that appear to be in the pipeline for the near term—5G, AI, 3D printing that will advance beyond the capacity to make little heads of Lincoln—and compare that with the types of technological advances over the past decade—such as varying sizes of iPhones, Facebook, and the Oculus Virtual Reality headset—I do believe that there is a reasonable chance that productivity growth in the period ahead could shake off some of its recent torpidity, particularly as strong demand leads firms to revamp production methods. Obviously, the technological optimism is mostly forward looking. Productivity has picked up a bit. But, really, the past-quarter increase just matches the average pace over the past decade.

Still, all in all, I have a fairly high assessment of the economy's potential growth rate, at least relative to the staff, and on the basis of the SEP of the Committee—although I would hasten to add that my estimate remains well below that of some outside commentators who have active Twitter accounts. [Laughter] Now, higher potential real GDP growth also suggests a smaller output gap in my forecast, relative to the staff, which provides me a little comfort after reading the somewhat alarming Tealbook alternative view box on the strong but precarious projection, which points out that large positive output gaps are a pretty good indicator of an impending recession. Presumably, that's because larger output gaps present risks to the outlook as the

economy runs into constraints that push up prices or perhaps lead to unsustainable financial imbalances.

So what are the signals that the economy is running up against constraints? Traditionally, that would be inflation. Obviously, inflation is not sending any warning signs currently, either in prices or wages. But maybe in a world with a flat Phillips curve and very well-anchored inflation expectations, inflation as a signal that we are pushing the economy where it doesn't want to go, is not as good a signal as it has been in the past. I certainly am open to other indicators of capacity constraints and overheating, in addition to inflation. We don't want to be in a position of taking advantage of those very well-anchored inflation expectations—again, to be pushing the economy where it doesn't want to be—because we will eventually lose that contest, and potentially at great cost. All that said, that really is more of a risk. In my baseline projection, as I said, I'm very optimistic about potential growth. I expect even relatively strong demand growth to be fulfilled without excessive pressure on prices.

I also think that there may be more slack in the labor market than might be apparent from looking at the unemployment rate alone. In particular, cross-country comparisons show that the participation of prime-age workers in the United States, both male and female, have fallen well below rates that are seen in many of our advanced-economy peers. Differences in childcare and maternity policies may explain some of the lower female participation here, but my understanding is that the shortfall in male participation is really very difficult to explain. And as a consequence, there does seem to be some potential for prime-age participation to continue moving up, relieving some of the tightness in our labor markets. Transparency being my halberd and my shield, let me make clear that I am SEP participant number nine.

CHAIRMAN POWELL. Thank you. President George.

MS. GEORGE. Thank you, Mr. Chairman. The 10th District economy continues to expand at a solid pace, with signs of further labor market tightening. In our District business surveys for May, labor and wage pressures were the top concerns in terms of the potential barriers to future growth for services and manufacturing firms. Labor market concerns ranked higher than trade policy, rising interest rates, higher oil prices, and regulation. In fact, one District contact from the hospitality industry noted they have even begun to reach out to former employees they had fired to try to fill job openings. [Laughter] I'll give you the name of that hotel later. District manufacturing activity remains especially strong. Our manufacturing survey in May posted its highest reading in the entire 24-year history of the survey. Survey responses also pointed to some price pressures, with about one-third of factories reporting an increased ability to pass cost increases through to their customers. Following the run-up in materials prices since the beginning of the year, however, particularly for materials linked to trade policy discussions, firms expect limited input price increases in coming months but continue to express uncertainty due to unresolved trade negotiations and associated rhetoric.

The outlook for energy—and, to a lesser extent agriculture—has improved. For the energy industry, higher oil prices are supporting investment activity. An increase in capital expenditures is evident across multiple segments of the industry, with substantial growth in investment by upstream firms involved in drilling activity. I expect the growth in investment activity to continue through the remainder of the year but to moderate a bit as oil prices stabilize. And for agriculture, improvement in both supply and demand factors has boosted the outlook for grains. Drought in Brazil and Argentina reduced corn and soybean production this spring, helping to push up prices globally. With U.S. agricultural exports expected to be the second

highest on record this year, the region's farm sector feels particularly vulnerable to the imposition of tariffs on trade flows to our key export markets.

Regarding the national economy, my outlook for economic growth is little changed since our previous meeting, and my assumptions for this SEP look similar to the one I submitted in March. Incoming data point to solid consumption growth in Q2, and nominal wage growth appears to be well positioned to support consumer spending over the medium term. Even so, as economic growth moderates over the medium term, I think it is worth monitoring potential vulnerabilities for the household sector. In particular, the personal savings rate has slipped back down to 2.8 percent after rising earlier in the year. And data coming from the survey of consumer finances is a reminder that wealth gains over the past decade have been concentrated at the very top of the income distribution. In addition, the most recent release of the Survey of Household Economics and Decisionmaking continues to show that a significant share of households do not have the resources to cover an emergency expense of \$400. Wealth has been slow to recover for many households over the past decade, but a positive sign for the durability of the current expansion is that debt service obligations for households remain at low levels. The financial obligations ratio has risen only modestly over the past five years and remains lower than levels dating back to 1995.

Supporting my outlook for strong investment growth the second half of the year, research by my staff suggests that robust M&A activity in the United States should lead to future strength in business investment. Firms use acquisitions to reposition themselves strategically within their industries or to acquire new production and distribution networks and then subsequently make new investments to capitalize on these newly acquired assets. The total number of acquisitions increased more than 10 percent last year and surpassed the number of acquisitions at the peak

more than a decade ago. This current high volume of M&A activity observed broadly across industries, along with complementary information coming from surveys that point to strong business confidence, suggests firms are continuing to seek new production opportunities that will promote investment growth over the medium term.

Labor markets continue to tighten, and the unemployment rate, now at 3.8 percent, is well below my assessment of its longer-run level. Anecdotes given by business contacts lament labor shortages. In contrast, workers seem increasingly confident about their employment prospects. Among the 24 labor market variables that we track in the Kansas City Fed's Labor Market Conditions Index, the variable that made the strongest contribution to the improvement in the level of activity over the past six months is the rise in voluntary unemployment. The share of unemployed workers who report that their reason for being unemployed is that they left their job voluntarily and immediately began working for their next job is at its highest level since November 2000. Year-over-year inflation looks poised to reach 2 percent this year, with upside risk over the medium term as labor markets continue to tighten and the economy continues to grow above its trend rate. Although higher energy prices will boost headline inflation in the near term, oil price futures point to softer prices in the next 6 to 12 months, consistent with an expectation that OPEC may relax its output restrictions by year-end.

I continue to view the risks to the outlook at roughly balanced. On the upside, accommodative financial conditions and expansionary fiscal policy could lead to further increases in real GDP growth and inflation. On the downside, trade policy uncertainty and the potential for increased financial stress abroad could hamper both foreign and U.S. real GDP growth. Finally, like others, I find judging the signal of a flattening yield curve difficult in today's environment. It is easy to see a variety of factors as contributing downward pressure to

the slope of the yield curve, including central bank holdings of long-term assets, which are potentially distorting the signal that a flattening yield curve sends regarding the likelihood of future recession. At the same time, the signals coming from real economic conditions, such as payroll growth, manufacturing activity, and aggregate investment, all point to a low risk of recession in the coming year. The dissonance of historical yield curve signals, and a strong projection of economic activity in my SEP, warrant monitoring of both financial and real economic indicators for potential shifts in the months ahead. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President Bostic.

MR. BOSTIC. Thank you, Mr. Chairman. Last week we had the opportunity to be the guests at a joint meeting of the Kansas City and Atlanta boards of directors. We had an interesting, extensive, and robust discussion about the state of the economy and how things might look from now on. My interpretation of the conversation is that views on the economy are quite similar across the two boards. And I thank the Kansas City team for their great hospitality. The barbecue really is good. [Laughter]

With respect to the Sixth District directors and contacts specifically, most report economic conditions that continue to evolve along a moderate growth path. Most report solid positive growth. But very few of our contacts reported what one might consider to be a transformative pickup in business activity. We heard the usual mixed bag of reports regarding wage pressures but have yet to detect any signals of a material acceleration of pricing pressures. It does appear that real GDP growth this quarter will come in above my priors. But my reading of the incoming data is that the apparent second-quarter strength is tied to transitory or idiosyncratic factors that don't signal a shift in momentum for the period ahead.

On the consumer side, a material part of the April bump up in expenditures on services can be tied to a spike in spending on utilities due to unusual weather patterns. The anecdotal reports of my directors and contacts suggest that the more moderate trajectory that is implied by stripping utility expenditures out of the overall consumption services data is likely to prevail moving forward. Moreover, the preponderance of reports received from businesses tied to the consumer sector indicate no discernible changes in the pace of spending relative to recent trends. As a consequence, I am in large part discounting the pickup in the consumer spending data we have received since the previous meeting. As with the consumer spending data, I am not inclined to read too much into the recent acceleration in business investment. A fair amount of that pickup is due to a rebound in spending on structures related to the mining and energy sector. Excluding energy and oil investment, investment growth is still below 5 percent on a year-over-year basis, a bit lower than the typical expansion average.

I began the year with a decided upside tilt to my risk profile regarding real GDP growth, owing in large part to an abundance of business optimism following the passage of tax reform. However, that optimism among my contacts has almost completely faded away, replaced by concerns and frustrations over trade policy, tariffs, and an appearance of disarray coming out of the D.C. area—the Board of Governors excepted, of course. [Laughter] Perceived uncertainty has risen markedly, causing many of my contacts to sideline their cap-ex plans. Projects already under way are continuing, but I get the sense that the bar for new investment is currently quite high. I'll offer just a few examples.

A large appliance manufacturer indicated that a \$250 million expansion plan at a District plant has been tabled because of the uncertainty on trade policy. A regional residential construction company reported pulling back on development plans and passing on land

acquisition opportunities due to uncertainty about tariffs and their effect on construction costs. And to quote one of my directors with ties to the auto industry, “The prospect of tariffs and the potential for a trade war have paralyzed our industry. Planning across all dimensions is at a standstill.” These are not isolated anecdotes. Though we hear sporadic reports of positive tax-related investment and, more broadly, ongoing spending on technology enhancements, “risk off” seems to be the dominant sentiment of the moment.

For now, I am hewing reasonably closely to the real GDP growth forecast I submitted back in March. I’ve slightly upgraded my real GDP growth projection this year to 2.7 percent to reflect arithmetic adjustments associated with what I think will be transitory strength in the Q2 data. So, Governor Quarles, I am catching up—but still slowly.

I have left my outyear projections alone and moved the balance of risks about my growth projection from “upside” to “balanced.” As I noted at the outset, the labor market and wage picture is mixed. Most contacts characterized labor markets as tight, but plans to respond by raising wages across a broad range of workers have not risen to a critical mass. I do hear some reports of planned accelerations in wages and salaries, but just as often I hear the argument that the issue is one of attracting sufficiently qualified workers—a problem that cannot be solved by increasing pay. In these cases, firms are focusing on, one, developing and training internal candidates and, two, increasing investments in automation. Responding to tight labor markets with increased spending on training or technology still adds to costs, of course, but reports of building price pressures, like reports of accelerating wage pressures, are sporadic.

Though rising energy prices and anticipated tariff-related costs are generating more reports of upward price movement along the supply chain, indications that the affected businesses expect to pass costs through to the final consumer are still somewhat limited. I have

marked up my headline inflation forecast for this year by one-tenth, reflecting the recent run-up in gasoline prices, but continue to see inflation through the medium term as running at, or perhaps modestly above, our 2 percent goal. Overall, I see the risks to meeting our inflation objective as roughly balanced. As my real GDP growth and inflation projections have not changed much since March, my SEP submission maintains the assumption of another 100 basis points of rate increases from today. Implicitly, however, in my projection I assume some movement in longer-term real interest rates as the expansion continues. I think things get interesting if that doesn't happen. But I will return to that point tomorrow.

And, finally, as this is your last meeting, Vice Chairman Dudley—Bill—I just wanted to say that I really appreciated, in my short time here, your perspective on the evolution of the economy and also your hospitality. Like President Harker, I really appreciated your opening your doors and being a host and a guide for me. So thank you very much for that. I will say, even though I have only been here for a year and worked with you for a short time, I have had the pleasure to watch you from afar. And I very much appreciate the leadership you have given through very turbulent times and the grace with which you have done it. So on behalf of everyone in the Sixth District, congratulations on retirement. Thank you, Mr. Chair.

CHAIRMAN POWELL. Thank you. President Kashkari.

MR. KASHKARI. Thank you, Mr. Chairman. Moderate growth continues in the Ninth District. Most industries report that they're expanding, but there are only modest employment gains this year to date, an outcome that many contacts attribute to workforce shortages. Interestingly, employment actually dipped in all of the states in our District in April. This might just be an aberration. On the other hand, there are very few signs of accelerating nominal wage growth. There are some signs of rising price pressures at the wholesale level, reports of rising

steel and aluminum input costs, and continuing inflation in construction costs, and there appears to be a strong capital equipment market. As others have noted, there are a lot of concerns in my region over potential tariff and trade policies. We're a very export-sensitive region.

For the national economy, consumer spending seems to be picking up after a weak first quarter. Since the previous meeting, job gains remain strong, and headline unemployment rate has fallen notably, from 4.1 percent to 3.8 percent. The staff's view is that slack is exhausted, and we are operating well above full employment; to me, that's very hard to square with modest nominal wage growth. Average hourly earnings and the employment cost index are both running at 2.7 percent, up only one-tenth for March. As others have noted, it's also hard to square with the fact that prime-age labor force participation still appears low and the employment-to-population ratio appears below pre-recession levels. I continue to think that the staff are too pessimistic about trend labor force participation and about the natural rate of unemployment. My staff briefed me on interesting work on the natural rate of unemployment done by Aysegül Sahin at the New York Fed. She points out that the average American worker has become older and better educated in recent decades, and at the same time, the average American firm has become larger and older. Both of those effects naturally reduce the job separation rate and thus the natural rate of unemployment—her estimate is the natural rate could be around 3.5 percent.

All right. Let's turn to inflation, which is now close to target. And 12-month core PCE inflation is still a bit below 2 percent, but I think we're getting there. And I feel good about that. As we look forward, rising oil prices will put some upward pressure on headline inflation and probably some bleed-through to core, but higher nominal wage growth will be required to sustain 2 percent over the medium term. So, in my view, we're close to our inflation target—not

quite there. In my view, we're probably not quite at full employment but getting closer. So this then turns to how much accommodation we're currently providing.

If we raise rates at this meeting, the target range for the federal funds rate will be between 1.75 and 2 percent. If we take the Tealbook's estimate of the neutral rate at face value—at 0.5 percent—with core PCE running around 1.8 percent, a neutral nominal rate would be around 2.3 percent. Thus, after this meeting we're only going to be modestly accommodative. I could argue we might not have much accommodation at all, because the error bands around where neutral is are so wide.

I'm going to talk about this and the yield curve a little bit more tomorrow, but when I look at this, I don't see anything in the data that suggests that we should be in a contractionary policy stance. Again, we're barely getting to our 2 percent target. Why are we going to slam the brakes on the economy? I don't know, so I'm going to talk about that and what the yield curve suggests .

When I think about the risks to the outlook, trade is a big risk that we've all talked about. It's out of our control. It's very hard to estimate the probability of the different outcomes. There are geopolitical risks. There's risk in Italy. There's the risk at Deutsche Bank that President Rosengren talked about. The one risk that's within our control is our raising rates too aggressively and ending the expansion ourselves. And so, again, I think the yield curve is going to give us some signal about that and about going back to neutral as opposed to moving to a contractionary stance. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. Vice Chairman Dudley.

VICE CHAIRMAN DUDLEY. Well, first of all, thanks everybody for their very kind comments. It's been very much my pleasure to work with all of you, and to work with the

Committee over the past 11½ years. I'm glad we're not having those unscheduled meetings like we were in 2007, 2008, and 2009. [Laughter]

Today you sort of added to my list of regrets. It's too bad these remarks won't be available in the transcript for another 5½ years. [Laughter] My mom is 95 years old, and I'm sure she'd be delighted to hear what you've all said. I'm going to have more to say at the reception this evening, and tomorrow, as we wrap this meeting up.

I'm where pretty much everyone else is in terms of the outlook. I don't think it's changed much since the previous meeting. Real GDP growth, I think the people probably agree, is on a bit firmer track. The labor market continues to tighten. Inflation is running close to our 2 percent objective, and I think, generally, the view is that the case for continuing to remove monetary policy accommodation remains compelling.

Where I guess I might be a little bit more in the cautious camp is; I do think the risks to the outlook over the longer term have increased. I've discussed at previous meetings how the U.S. fiscal outlook is on an unsustainable course. Because I've already talked about that, I'm not going to belabor it at my last FOMC meeting.

The second thing that has been touched on today is that both immigration policy and trade policy, I think, are evolving in a direction that's restraining the productive capacity of the economy. Less immigration means fewer labor resources and slower potential GDP growth, and higher trade barriers mean higher prices and lower productivity. And the productivity effect comes from two sources. First, trade barriers shift production away from areas of comparative advantage, and, second, changes in trade rules generate frictional costs as global supply chains are disrupted. As President Bostic talked about, investment is just deferred.

So, on balance, what we've seen recently, in my mind, in terms of immigration and trade policy, increases the risk that the economy will overheat in coming years because of less productive capacity. Of course, this assumes that these same actions don't lead to a sharp tightening of financial conditions, because that could be an offset. Well, markets haven't reacted much to the trade shift that's occurred to date. I'm not really sure what's causing that. It might be just because it's difficult to distill, from the rhetoric, where we're actually going to end up on this.

I think the consequences of any shift in trade policy are only going to play out very slowly. After all, the effect of each individual action typically is very small, in the context of the size of the national economy. But over time I am becoming more worried that these effects could accumulate to something more sizable, and, in that case, the negative long-term consequences would turn out to be sizable as well.

There are two other developments people have already touched on: The increasing stress on EME economies, most notably Argentina and Turkey—I was actually in Argentina on the week that the Argentine peso depreciated about 20 percent—and also the recent developments in Italy, which have led to a widening in peripheral European bond spreads relative to Germany. I don't see large consequences of either of these things for the U.S. economic outlook, at least at this point.

With respect to the pressure on the EMEs, this seems quite different to me than the taper tantrum. It's not a question of just a shift in animal spirits that is affecting financial assets broadly. The fact is that the fundamentals of several EME countries are poor, with large budget deficits and current account deficits. And I think this conclusion is supported by the table in Tealbook A and also in the chart that Steve included in his presentation, which shows that

investors seem to be discriminating across countries on the basis of the size of their vulnerabilities.

With respect to Italy, I think this is a long-term problem that will manifest itself slowly rather than something that is going to blow up over the near term. That's because I don't believe the Italian government intends to abandon the euro, or walk away from the European Union. And even if they did, I think they wouldn't have the political support to actually implement that. But it does seem to me very possible, even likely, that the government will follow a more profligate path on the fiscal side, and over time that could have two really important effects.

First, I think it would further harden resistance in Germany to taking additional steps, such as paying European deposit insurance, that would move Europe toward European integration. And that is problematic because that means all the internal inconsistencies that exist within the European Union will persist. You know, when times are good, those inconsistencies don't matter, but when times are bad, those inconsistencies really have pretty significant consequences.

Second, I also think it increases the risk of a hard stop sometime in the future. You know, if the Italian authorities were to systematically thumb their noses at the budgetary rules of the European Union, it's hard to see how the core European countries could ignore this indefinitely. So I don't know when it's going to happen—it's pretty far out in time—but you can imagine at some point that this would actually become quite significant.

At the New York bank, we've made very modest changes to our SEP submissions. We have a slightly stronger growth trajectory in 2018, which takes the unemployment rate slightly lower than in our March submission. As in March, inflation climbs modestly above 2 percent, and we continue to have four 25 basis point rate hikes in 2018, three in 2019, and two in 2020. I

guess that's a taper. In terms of uncertainties and risk, we have moved up our assessment of uncertainty for inflation to "above average," and that's due to the uncertainty stemming from the consequences of a very tight labor market—we don't really know how tight is too tight—and the uncertainties related to trade and immigration policies that I touched on earlier. Thank you.

CHAIRMAN POWELL. Thank you, Bill. And thank you, everyone, for a typically thoughtful and interesting round of comments. I hear a range of views on particular issues, but also kind of a broad consensus that the baseline outlook hasn't changed much since the May meeting, a consensus that I'm happy to join as well.

Still, there are interesting underlying dynamics at play. The U.S. economy looks a little bit stronger than it did in May and the outlook for advanced foreign economies a bit weaker. Emerging market economies remain strong despite weakness and stressful conditions in a few countries, and global downside risks may also have increased.

To begin on the domestic front: Data received over the past several weeks have corroborated our view that the slowing that was evident at the time of our May meeting was transitory. In fact, the incoming data have since been a bit better than expected. Information from the second quarter now points to real GDP growth with a "three" handle or perhaps even higher, according to some. Looking ahead, fundamentals continue to paint a very favorable picture, including strong job growth, fiscal stimulus, robust household and business confidence, and still-accommodative financial conditions.

As many of you noted, pointing to a range of indicators, the labor market has tightened further and, indeed, has surprised to the upside. Payroll gains have remained quite strong, and the unemployment rate is now five-tenths lower than a year ago. In addition, the participation

rate has been range bound since October 2013, another sign of strength conditional on downward demographic trends.

Core inflation moved up close to 2 percent, consistent with our well-telegraphed expectations. Headline inflation looks set to temporarily overshoot our goal, reflecting recent increases in energy prices. And, as a number of you noted, this welcome, but so far brief, return to 2 percent does not mean that we've achieved our broader goal of inflation around our symmetric 2 percent objective on a sustained basis.

Regarding the international front, the data show a modest weakening of momentum among advanced foreign economies. One question is how much signal to take from the recent slowing of economic activity in the euro area and in the United Kingdom. Part of that slowing can be attributed to transitory developments, like the weather and labor strikes, but softer readings coming from surveys of purchasing managers as well as some tightening of financial conditions suggest that more persistent factors may also be at play.

And the outlook for a few vulnerable emerging market economies remains bleak, with Argentina and Turkey, and now Brazil, under intense market scrutiny. Growth among other EMEs has remained robust, however, and in some cases has surprised to the upside, especially in Asia. So that's a generally bright outlook, and I'll turn to the risks.

Domestically, we continue to hear accounts of labor shortages, rising material costs, and capacity limits, which surely ought to be putting some upward pressure on inflation. And some of you are hearing more from business leaders about passing through these costs into prices. Although both wage and price increases have remained moderate, inflation risks are now more decidedly two sided. Still, looking beyond inflation risks, there could also be some benefits

flowing from having a tight labor market as some workers at the margins are drawn into the labor force.

Our business contacts around the country—I've heard this very widely—continue to mention risks, with an increasing concern associated with trade policy. It's clearly a growing concern, and, although we haven't yet seen a clear effect on confidence, spending decisions, or the outlook, that risk is really there now.

As for international risks, many of you have commented on political developments in Italy, which are adding to uncertainty and could produce a more protracted slowing in continental Europe. This does seem more of a longer-term problem, as Bill indicated. While the new government has now expressed commitment to remaining in the EU, there is a risk of disruptive developments.

Many of you also discussed the vulnerability of EMEs to a stronger dollar, higher U.S. interest rates, and higher oil prices. So far, investors appear to be differentiating between countries with better economic fundamentals and those in more precarious conditions, but we have seen broad outflows from EME funds and downward pressure on equity markets and currencies. There is clearly a risk of a more general flight from EMEs that could have negative implications for the economy.

Briefly, regarding policy, it seems that the modest changes to the outlook provide little reason to alter our course of gradual rate increases. The case for that approach is founded on the need to balance the risk of moving too fast, which could leave inflation short of a sustained return to our symmetric goal, versus the risk of moving too slow—which could lead to an overheated economy with too high inflation or material financial imbalances. In my view, it will be appropriate to continue on our gradual path by raising the target range for the federal funds

rate by 25 basis points at the conclusion of tomorrow's meeting. So thanks again for a thoughtful discussion, and we will, I guess, go ahead with Thomas's monetary policy briefing and a Q&A on that before we break for our reception.

MR. LAUBACH.⁴ Thank you, Mr. Chairman. I would also like to start by thanking Vice Chairman Dudley for his leadership and advice to myself and many of my colleagues in many policy discussions. I will be referring to the handout labeled "Material for Briefing on Monetary Policy Alternatives."

With alternative B, the Committee would continue to communicate its expectation that gradual increases in the federal funds rate will remain appropriate to sustain a strong labor market and inflation near 2 percent by balancing the risk of overheating against the risk of failing to return inflation to 2 percent on a sustained basis. As noted in the upper-left panel of your exhibit, the changes in alternative B are intended to keep your communications in line with your expectation that, along this path, monetary policy will likely move from being accommodative to being somewhat restrictive and that the federal funds rate will, before too long, run at or above levels you expect to prevail in the longer run. In your latest projections, 9 of you anticipate that, by the end of 2019, the federal funds rate will exceed your estimates of its longer-run normal value, and 12 of you project this gap to widen to between 0.4 and 1.4 percentage points by late 2020. These projections imply that, at some point further out, the slope of the expected path of your policy rate will be negative.

In light of your ongoing discussions about the potential information content of the yield curve for the likelihood of a future recession, the staff provided some further analyses on the topic in last week's Board briefing and in the two Tealbook boxes that were already mentioned today. One of our objectives was to try to distinguish between the signal that the slope of the yield curve and other financial variables are sending *now*, and the signal they will likely send in the future, if interest rates evolve as assumed in the Tealbook baseline. The ability of inversions of the yield curve to forecast recessions likely arises from two kinds of historical situations. In the first, monetary policy had been tightened with the intention of slowing growth in aggregate demand, in order to reduce inflation. In the second situation, monetary policy was in a neutral or slightly restrictive position when the economy was hit by an adverse shock to aggregate demand. In either situation, market participants expected the federal funds rate to be reduced substantially, and the yield curve inverted because the resulting negative slope of the expected path of short-term rates was sufficient to overcome a long-horizon term premium that was substantially positive at the time. Presumably, it is the expectation of substantial reductions in short-term rates that explains the well-documented power of the yield curve inversions to predict recessions.

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

One of the Tealbook boxes provides a closer look at which part of the maturity spectrum gives rise to this predictive power. The analysis in the box hypothesizes that the portions of the yield curve that are most sensitive to changes in the expected path of monetary policy in the near or medium term should most clearly reflect market participants' expectations for recession and thus provide the sharpest inference for predicting recession. Another benefit of focusing on near-term portions of the curve is that doing so largely sidesteps the issue of the secular decline in the long-horizon term premium. The box shows a test of this hypothesis that involves estimating probit regressions and comparing the forecasting power of a near-term spread—defined as the five-quarters-ahead forward rate minus the one-quarter-ahead rate—with that of longer-term spreads. The upper-right panel plots a longer-term spread, the gap between 10-year and 2-year Treasury yields, in blue, along with the near-term spread, in red. Also shown is the near-term expected slope of the federal funds rate path, the red dotted line, obtained from the Blue Chip survey. Over the past few decades, the near-term spread and survey-based expected slope of the funds rate have indeed nearly moved in lockstep—suggesting that the near-term spread is a relatively clean indicator of expected monetary policy.

The middle-left panel shows a “butterfly chart” documenting how the near-term spread evolved in the quarters leading up to recessions since 1973. In all cases, the near-term spread turned negative at least three or four quarters in advance of the onset of recession. In most cases, the near-term spread fell to a level around minus 1 percentage point before the recession.

In the middle-right panel, the red line shows the probability of recession estimated using the near-term spread, while the blue line shows the probability using the long-term spread. The near-term spread model shows somewhat sharper spikes before recessions compared with a model using only the long-term spread. When both the near- and long-term spreads are included as explanatory variables, the near-term spread retains a large and significant coefficient, whereas the coefficient for the longer-term spread falls to essentially zero. The more general finding is that the near-term spread appears to provide at least as clear a signal of oncoming recessions as that provided by longer-term spreads. That said, with only six recessions in the sample, one cannot say with much confidence that one indicator is better than another. Currently, neither model predicts a likelihood of recession that is materially above the unconditional mean for this sample, shown by the horizontal line. Nevertheless, one might reasonably hope that, for predicting future recessions, the near-term spread would be more robust to secular changes in the long-horizon term premium.

The lower-left panel depicts the estimated relationship between the near-term spread and the probability of recession. The horizontal axis shows a range of values for the near-term spread. The vertical axis shows the probability of recession corresponding to each level of the near-term spread as estimated using the probit model. The most recent observation is shown by the green square. This spread is just below the historical mean, the vertical line, and implies a recession probability of about 15 percent.

What does the near-term spread model imply for the probability of a recession along the median SEP path? To answer this question, one must make an assumption about how the federal funds rate will evolve beyond the level of the SEP median at the end of 2020, which is 50 basis points higher than the median longer-run value. Suppose that the federal funds rate declines smoothly beyond 2021 at a rate of about 25 basis points per year. In this case, the near-term spread would reach a minimum of about minus 25 basis points sometime in 2021. As shown by the yellow diamond in the lower left, at that point the model would predict a probability of recession of about 50 percent. This level is notably higher than the unconditional probability, but still lower than the level observed before past recessions.

The lower-right panel offers some implications for your discussion of the appropriate path of future monetary policy. First, recessions are notoriously difficult to predict, in part because they are, fortunately, not all that frequent, and thus the predictions of any single model need to be treated with caution. The model I discussed has the virtue that it uses the expected path of the policy rate over a relatively short horizon to estimate the probability of recession. It suggests that a modest overshoot of the federal funds rate as shown by the SEP median in 2020 could imply a heightened risk of recession beyond that point. From a longer-term perspective, it would appear that, if a period of restrictive monetary policy will prove to be appropriate, gradually raising the federal funds rate above its longer-run value and then gradually lowering it would imply a lower likelihood of a recession than would be implied by a path that involves raising the federal funds rate more rapidly and then reducing it more rapidly.

Thank you, Mr. Chairman. That completes my prepared remarks. The May statement and the draft alternatives are shown on pages 2 to 9 of the handout. And I would like to direct your attention for a moment to the implementation note on page 8 where you see at the top of the page some red language. I just want to bring this to your attention. The intention of this language is to reflect in the statement more broadly the communications that you had in the minutes of the May meeting. Thank you.

CHAIRMAN POWELL. We'll have question and answer. Maybe we'll have just a second to read this first.

MR. LAUBACH. Sure.

CHAIRMAN POWELL. Okay. Why don't we take 30 seconds to read this, and then we'll have Q&A. [Pause] Okay. Questions or comments for Thomas? Jim.

MR. BULLARD. Thank you, Mr. Chairman. I appreciate the staff's work on the box in Tealbook A called "Don't Fear the Long-Term Spread," which is reiterated here in exhibit 1 of

Thomas's presentation. And I will just give you my take on it. I think it's a very nice analysis. I think it's an innovative thing to look at the short-term spread instead of the long-term spread. I think there may well be near-term information there. You know, it's very intuitive that markets are looking only one year ahead and then predicting a decline in the policy rate, and the reason they are expecting that is that they think weaker economic conditions are ahead.

I would also say, just eyeballing these pictures, that the correlations are very high between the short-term spread and the long-term spread, so they are probably very collinear and telling us more or less the same thing. Also, if you look at the implied probabilities of a recession, they are highly correlated. So it looks like you are getting essentially the same signal from the two types of inversion, but, nevertheless, the more the merrier. Why not look at more than one signal?

And the overall message to me is that neither is predicting recession ahead today, which I think is consistent with what everyone is saying about this issue. My concern in trying to have this debate about yield curve inversion is that we have it before we get to that state of being in inversion so that we go in with our eyes open, if we want to go to that state of the world.

Thank you.

CHAIRMAN POWELL. President Kashkari.

MR. KASHKARI. Thank you, Mr. Chairman. This is the near-term versus the long-term spread. The thing I struggle with is, you talked about how the near-term spread has the advantage that you take out the secular decline in long-term real interest rates. But to me, those are really important in assessing where we are, relative to neutral. So if I just think about what the near-term spread is telling us, and if the near-term spread inverts, it's already too late. It's

like President Mester said—by the time the near-term spread inverts, the recession is basically already baked, and there’s nothing we can do about it.

So, to me, I’m looking at the long-term spread as an indicator—given these wide ranges of where neutral could be—as providing us with some information about where monetary policy is relative to neutral. Are we, in fact, moving to a contractionary stance? And if we’re doing so, we should do so with our eyes open and make a conscious decision to do so. Push back on me, though. I mean, am I misinterpreting the long-term spread?

MR. LAUBACH. I’ll be glad to “push a little bit back.” [Laughter] I think the point that I tried to stress was not so much that the near-term spread would abstract from a decline in long-term real interest rates. It’s more about abstracting from changes in long-horizon term premiums. That is part of the discussion of whether the secular decline in long-horizon term premiums is a particular challenge for any long-term spread that keys off, say, the 10-year yield as one element. And I think, in part, this is really an unsettled issue because, while we can historically try to run horse races, it is the case—unfortunately, for this purpose—that the previous recession was a long time ago, and since then the long-horizon term premium has declined a lot.

So the jury is really still out on whether you should control for the changes in the long-horizon term premium or not, which is what the near-term spread does. It’s not so much about long-term real interest rates as it is about the term premium. That’s one piece. The other thing is that I’m not quite sure whether I would quite go so far as to say, when the near-term spread inverts, it’s too late. As you can tell, a near-term spread of zero, say, doesn’t lead yet, according to the model, to a high recession probability. So it needs to invert, I would say, measurably. So if it’s just going a little beyond flat, that doesn’t, according to this model, necessarily signal a

recession. And if you look at the butterfly chart, in most instances, you know, it was minus 0.5 percentage point or more negative.

MR. KASHKARI. Can I follow up?

CHAIRMAN POWELL. Please.

MR. KASHKARI. But how do you think about—you know, my staff went back through previous FOMCs and previous discussions of the yield curve and term premiums, et cetera, and it's remarkable. In previous episodes, just as President Bullard said, "This time is different" was, all around, why this term premium is different now. And then we went into recession. And so I'm very loath to make these adjustments that you're talking about.

MR. LAUBACH. I would need to look at those discussions in the transcripts.

CHAIRMAN POWELL. Thanks. Vice Chair.

VICE CHAIRMAN DUDLEY. Look, I think this is terrific. I completely agree with this. I think it makes perfect sense. The yield curve inversion is all about the tightness of monetary policy. And by focusing on the short term, you're really focusing on market expectations of the tightness of monetary policy. And while it's true that these have been collinear over a long period of time, they might not be as collinear now because of the fact that the term premium has been moving a lot—a lot—over recent years.

So, you know, you can completely subscribe to the term yield curve version of the story, but I think what Thomas is doing is handing you a better tool to evaluate it, because it's really focused on the tightness of monetary policy, which is the core of why the term "yield curve inversion" has actually historically been so reliable as a signal. Thank you.

CHAIRMAN POWELL. President Williams—I see a bunch of hands. Actually, Neel.

MR. KASHKARI. Forgive me if I'm misunderstanding. Why does the near-term spread give us a good signal about the tightness of monetary policy?

VICE CHAIRMAN DUDLEY. Because people think that the federal funds rate today is high relative to whatever the federal funds rate is going to be in the future. Why do they think that? Because they think that the monetary policy is tight enough to slow the economy down significantly, and so they expect that the Federal Reserve will respond by lowering interest rates in the future.

MR. KASHKARI. But do you think it's a signal relative to where they think monetary policy is going to be one year from now, not where they think it's going to be relative to some concept of neutral over, say, the medium term? I don't see that as giving us better information.

VICE CHAIRMAN DUDLEY. Well, the reason they think rates are going to fall is because they think policy is tight relative to the state of the economy. So it's expectations. The markets are making a judgment about what they think monetary policy setting is today relative to what it needs to be in the future. If they think the federal funds rate is going to be lower in the future, they are basically saying, "Gee, policy is tight," and that means there is a high risk of recession. Now, it doesn't mean that the markets necessarily have to get it right. I mean, there is also the possibility of the markets getting it wrong. But the track record seems to be that the markets generally get it pretty much right.

CHAIRMAN POWELL. Okay. President Williams.

MR. WILLIAMS. Loretta has a two-hander, I think.

CHAIRMAN POWELL. Two-hander?

MS. MESTER. Oh, I don't know, I don't know. [Laughter] One.

CHAIRMAN POWELL. I'm counting two. Okay, please go.

MS. MESTER. Well, maybe it's a two-hander because Neel had mentioned my name. [Laughter] So my comment about it being too late was actually about looking at the model in the other box, which was David Miller's box. And there it's very interesting, because, remember, it's not only the slope of the yield curve, it's also the term premiums in that model. And credit spreads are in that model, and the output gap is in that model. And I think that's something to think about. I mean, it's great to have the yield curve slope as an indicator, but we have other models that include other things that I think are relevant, because what bothers me about this yield curve thing is it's a correlation. And it's a correlation that seems robust, I grant you that. But I think we have to get behind that and actually look at what is the cause of it. And so I kind of like this work in the Tealbook that David Miller did, because it tries to get a little bit about other factors that are important. And in that case, it was too late to really use monetary policy to address what was going on in the Great Recession.

I think this is an interesting conversation, but we have to be careful about looking at correlations and not really asking ourselves, well, what caused it? If we get into a situation where we get behind the curve in terms of the output gap, I think that's where we waited too long. And so that's my concern here.

CHAIRMAN POWELL. Thank you. President Williams. Jim, is that a two-hander?

MR. BULLARD. No, go ahead.

CHAIRMAN POWELL. Go ahead.

MR. WILLIAMS. I actually just want to make a couple of quick comments. First of all, I agree with the point that this expectation in the market that we are going to cut the rate over the next year is clearly a sign that something's happened that has convinced the markets that policy,

at least now, is too tight, and, therefore, the economy is going to weaken, and, therefore, the FOMC is going to cut rates. That is a similar thing, I think, as the inverted yield curve.

I do have one word of caution about the interpretation of this box, and then even Thomas's presentation, and that is that if you think about what this regression is actually doing, it's going through history. This gets to President Mester's point about causation versus correlation. What is happening in time is, presumably, the FOMC is doing the best it can to set monetary policy. You get a negative shock. The negative shock hits. Markets look and say, "Okay. Given the effect of that shock, will the stock market collapse or the housing market collapse? We expect the Fed to lower interest rates." That's correlated with the fact that a recession follows that.

So I would caution a bit about reading this final box that Thomas put out and also reading the final bit in the box in the Tealbook, which is actually doing the reverse. It's saying that we expect to cut interest rates gradually. Therefore, the probability of a recession is low. I don't think you can actually draw that conclusion, because what you're doing is taking a history in which there is a shock, people expect us to cut, and that's followed by a recession, and then saying, "Well, as long as we cut interest rates slowly, we are less likely to have a recession." I don't think that's what you were implying. That was implied a little bit, quite honestly, in the Tealbook box, that this probability will be low because we will be cutting interest rates gradually. An important part of this analysis is, it's not actually about tight monetary policy—I agree with Bill that that's the right interpretation—but the mechanics of it is cutting interest rates, and so be careful about running it forward in time.

The last thing I will mention, just because I feel I have to, if you run the same experiment that you all ran, and we have all now run using r minus r^* or using the Holston-Laubach-

Williams estimates, you are also finding the same kind of thing. There I actually feel that the interpretation is pretty straightforward. When, for whatever reason, the real interest rate gets significantly above the neutral interest rate, the probability of a recession after that is somewhat higher. And I think the interpretation again is that there is a shock that hits as monetary policy is relatively tight, and the recession follows from that.

So I would go back to this point. We have a lot of these models: r minus r^* ; the forecasts of the short-term interest rate, what we call the short; the near-term spread; we have a long-term spread—all of these are telling us, I think, basically the same kind of things. But I would be a little bit cautious in interpreting them literally when thinking about what the probability of a recession is, say, in three years. Thank you.

CHAIRMAN POWELL. Thank you. Governor Brainard.

MS. BRAINARD. Two things. I think this is very interesting. The distinction between the 10-year and the 2-year yield in terms of term premiums being depressed and moving around is not actually that clean a distinction, because the 2-year term premium has also been quite negative and moving around quite a bit. So I'm not sure it does accomplish what you are setting out to do, although the correlations are interesting.

And the second question is, when you use the difference between the SEP forecast and the long-run federal funds rate as a proxy for the yield curve, you are essentially assuming that the term premium is not going to change, and yet I think we have some staff estimates that suggest the effects of our balance sheet rolloff would more than compensate, if in fact those estimates turned out to be the case. So I'm just interested in whether you actually don't any longer believe that we are going to see any effects on the term premium of that ongoing balance sheet rolloff.

MR. LAUBACH. Far be it from me not to believe in this any longer. We show it to you in every Tealbook. However, I would imagine that these effects are scaling up roughly with the maturity. So the term premium effect, we think, is most concentrated, say, in the range of 10 years. You're right that the analysis here is taking a little bit of a simplified approach, in that it interprets this near-term spread as mostly unaffected by term premiums, and that's certainly not literally true. Again, the dashed line in the upper-right panel provides you with some measure to which that may be true. There is probably some term premium in there, but one would think that the term premium swings and also the secular decline are smaller than in the 10-year rate.

CHAIRMAN POWELL. President Barkin.

MR. BARKIN. Yes. Your point on the bottom-right panel, which is gradually raising the fund rate, then gradually lowering it, would lessen recession risks. I referenced that just a second ago. Can you just explain that again? I didn't follow your rationale when you were explaining it.

MR. LAUBACH. President Williams may disagree with this, but it is taking the model literally to say, well, the yield curve slope is mechanically related to the probability of recession. One possible explanation for that could be that it really measures the degree of restrictiveness of policy. And when monetary policy is relatively restrictive, for example, the probability of falling into a recession may be higher, the reason being that it then takes smaller adverse shocks in order to tip the economy into recession. So if you then follow that logic, because this curve here is not linear—so if you, say, induced for one year a spread of minus 50 basis points, that pushes you to a probability of recession of roughly 80 percent, according to this figure, whereas the minus 25 is keeping you at a lower level.

MR. BARKIN. If you moved it and you didn't like the outcome, you could just move it back, is your—okay.

MR. BOSTIC. And move it in small amounts.

MR. BARKIN. Right. Got it.

MR. LAUBACH. Yes.

CHAIRMAN POWELL. President Harker.

MR. HARKER. Thank you, Mr. Chairman. The only thing I'd add is the suggestion for a conversation at some future date, because that argument assumes a continuity in the smoothness, that if you add on a behavioral lens—if the market believes, whether it's right or not, that this correlation exists, and it, in fact, is causal, and if that belief becomes cemented in the minds of participants, that when things happen, they happen fast. Right? They don't happen in a nice, smooth manner.

I think a conversation at a future date is, again, to put a behavioral economic, behavioral finance lens on this and ask if there's a sufficient number of market participants that actually believe—and I think right now if you listen to the pundits on CNBC, they clearly believe this is causal, they don't believe it's just some correlation—what does that imply for policy?

CHAIRMAN POWELL. President Bostic.

MR. BOSTIC. I actually agree completely with what President Harker just said. The market does believe this is causal, and if they see it, they're going to freak out and act dramatically. To me, though, I don't think this is causal. I'm more in the President Williams camp, and it raises the question for me about whether we have an obligation to try to have this conversation with the market to try to get to a different understanding about what the nature of this relationship is. Because if we believe something that's different from what they do, that

increases the likelihood that there's going to be a misinterpretation of what we're doing, and we will not get the market response that we're hoping for.

CHAIRMAN POWELL. President Bullard.

MR. BULLARD. Again, I think this is a great discussion. I just want to augment it by, one, noting the observations on this blue line in the top right-hand figure here, which is the spread between the 2-year and the 10-year rates. And I want to point out the mid-1990s situation, because that was one that influenced me. And my point is that this can be useful even beyond the recessionary situation. So if you remember that in 1994, this Committee raised the policy rate 300 basis points, which seems inconceivable today. But we raised the policy rate 300 basis points in an attempt to get back to normal.

And in 1995, the risk of a recession seemed higher. The real-time data actually seemed very risky at the time, and it looked like maybe we would go into recession. That was skirted, and as you all see here, this spread never did go negative, all the way through the rest of the 1990s. And it set up one of the best periods that we've had in U.S. macroeconomic history. So I think that was a case in which we probably weren't talking yield curve as much at that time, but that was a case in which we did normalize, but we stopped somehow at the right time. And we got a good situation for the rest of the 1990s, with a healthy upward slope to the yield curve, but with a policy that was just right to get inflation really right at 2 percent through that whole period. So I think this is maybe a little more useful than just trying to predict recessions. That's the point.

CHAIRMAN POWELL. I'm going to call on myself with a two-hander. I'm not sure if that's a legal move. [Laughter]

Reacting to President Harker’s comment: I think there’s a disparity of views around the table about this, partly because people are still thinking their way through the issue. So I think if people are going to talk about it publicly, I think it would be really healthy if people were to say, first of all, that there is a range of views, and, second, that it’s one of several things that we look at, not one. And so I really think, as people share their views on this, it would be useful if that could be part of what we all say, and then we can have disparate views about what we think overall. So with that—President Evans.

MR. EVANS. It’s a slightly different question, if that’s okay.

CHAIRMAN POWELL. Please.

MR. EVANS. For Tom as well. [Laughter] Looking at the black line in the middle-left panel, the near-term slope of the yield curve—this is a butterfly chart—the black line is just beautiful. I mean, it’s just exactly what you would want if this was going to be an indicator of the recession. And then I looked at it, and I saw that it said 1973, and, you know, maybe it’s because I’ve been sitting next to President Williams for so long and it’s the last time I’m going to have the chance to do this, but the question I have for Thomas is: Who won the World Series in 1972? Was it the Oakland A’s or the Cincinnati Reds? [Laughter] That could be completely determinative [laughter], if I have learned anything.

PARTICIPANTS. Oakland A’s.

MR. WILLIAMS. Was it the A’s? That was when they “three-peated.”

CHAIRMAN POWELL. Are there additional comments? Hearing none, we will now adjourn downstairs for an event honoring Vice Chair Dudley. See you tomorrow morning here at 9:00. Thanks very much.

[Meeting recessed]

June 13 Session

CHAIRMAN POWELL. All right. Good morning, everyone. Let's resume now with our go-round on monetary policy, and we'll begin with President Rosengren.

MR. ROSENGREN. Thank you very much, Mr. Chair. I support alternative B. Under a forecast in which the unemployment rate significantly undershoots our estimate of the natural rate, and, on the other side, we are likely to overshoot our inflation target, it is appropriate to raise the federal funds rate at this meeting. It is certainly the action expected by the market.

The decision for this meeting seems straightforward, but the path forward is a bit more complex. To my eye, the path of the federal funds rate in the SEP still seems somewhat shallow. To be sure, a steeper path than the SEP path risks financial turmoil and the possibility of causing the recession we wish to avoid. On the other side, however, allowing significant macroeconomic imbalances to linger for years risks a more pronounced unraveling. We're in a difficult position, attempting to set policy so as to balance these risks and engineering a policy rate path that is not too steep, not too shallow. I do not claim that choosing a path is easy, but my sense is that, at present, we are headed for a policy rate path that is somewhat too accommodative and which will allow imbalances to linger for too long. Accommodative monetary policy at a time when the unemployment rate is already 3.8 percent and fiscal policy is expansionary, is a recipe for moving the economy further into a state of significant imbalance. If there were no inflationary or financial implications associated with such an imbalance, I would be all for it, but assuming only modest wage, price, and asset price movements in such an environment seems risky.

There are, of course, other risks to the outlook—financial risks, trade risks, and geopolitical risks—that could slow down the economy, perhaps enough to cause us to reverse course on monetary policy. But unless those risks become reality, the primary risk that I see is

that our baseline forecast expects an economy that is running “hot” and, quite likely, “too hot,” threatening the expansion’s sustainability. Thank you, Mr. Chair.

CHAIRMAN POWELL. Thank you. President Bullard.

MR. BULLARD. Thank you, Mr. Chairman. Let me join with others in congratulating Bill Dudley on his retirement. I’ve had a 10-year association with Vice Chairman Dudley. He used to sit over here, and then he moved over there. He’s been my colleague on the Committee and at the COP. Over the past decade, I visited New York many, many times and worked from the New York Fed many of those days, and I really appreciate Bill’s hospitality and the time on those occasions to talk over issues facing the Committee.

I felt that Bill did very important work in “de-imperializing” the New York Fed and better integrating the Bank with the rest of the System, which I think has been a longstanding issue for the Federal Reserve, and Bill did a lot to break that down. I also think Bill did important work for the Federal Reserve internationally at Basel and on key issues like LIBOR reform, but also many other issues. Whenever I got feedback from abroad on Bill, it was always extremely positive, and I think he did a great job in representing the Fed on that dimension. Bill also played an important role on the FOMC, in my opinion. The Committee needs a financial markets view to complement the business view and also to complement the academic or models-based view of the economy. In my opinion, the Committee couldn’t have had anyone better placed than Bill Dudley to provide that view over the past 10 years. So congratulations on your retirement.

Mr. Chairman, generally speaking, I think we’re in a good position today, but that we may soon become too “hawkish.” This is because it doesn’t take that much to be “hawkish” in today’s global interest rate environment. Robust economic growth is probably temporary, driven

in part by temporary fiscal policy effects. Robust labor markets are welcome and are unlikely to produce meaningful responses of inflation over the forecast horizon, under current estimates of the Phillips curve. The Committee has already been preemptive and is not at all lagging behind macroeconomic developments.

Market-based inflation expectations remain low when adjusted to a PCE basis. These expectations already incorporate all available information, including strong labor markets, fiscal policy, and an expectation of monetary policy more dovish than the Committee's SEP median. This suggests that inflation is not about to rise meaningfully. The Dallas Fed trimmed mean inflation rate is 1.7 percent year over year—about where it has been for many years.

Reading some details overnight, I think the recent CPI report was affected by energy prices, with some bleed-through, probably, to core PCE inflation. That's one reason I want to switch from core PCE inflation to the Dallas Fed trimmed mean.

A yield curve inversion is lurking, and, if it occurs, it would be because this Committee is putting upward pressure on the short end of the curve. With inflation as low as it is, we do not need to test theories about "This time is different" with respect to yield curve inversion. The idea that term premiums are exceptionally low now because of QE effects is not the correct view if one thinks of QE as mostly working through signaling effects. Those signaling effects would not exist now, so we could read longer-term yields as reflecting fundamentals with respect to expectations of future real growth and future inflation.

Taking these considerations into account, I support alternative A for today. I think we're in some danger of coming off as too "hawkish" at this meeting. Alternative A is not really all that dovish. It is just a restatement of alternative B in a little softer language. However, in my opinion, it would provide more optionality for the Committee as we head into the second half of

2018. In particular, the phrase “appropriate monetary policy accommodation” is more nuanced for the current situation and will get markets to focus on economic developments more directly than on Committee promises. And, just to remind everybody: We have the SEP median in any event, if you want to worry about forward guidance. The phrase “appropriate monetary policy accommodation” could then be modified in the future when we think we’ve reached neutral, and we could get rid of the word “accommodation.”

Paragraph 3 of alternative A also stresses that inflation expectations need to be re-centered and I think this is an important complement to the idea that the Committee is now projecting, according to the median SEP, that inflation will slightly overshoot the Committee’s target for some time or over some part of the forecast horizon. Market-based inflation expectations dropped dramatically in 2014. They’ve never really recovered since that time, even though they’ve been up somewhat recently, partly on energy prices.

I think the changes in paragraph 4, which are the same in alternative A and alternative B, are appropriate and welcome. I would now think about not having paragraph 4 at all. If you look at paragraph 4 today, it actually doesn’t say much, so I think a next step might be to eliminate paragraph 4 entirely.

On the issue of press conferences, I would say, “What a good idea.” I think it’ll provide more optionality for the Committee as we get into trickier business about making monetary policy decisions. I think upcoming decisions will feel more like ordinary times—where we might want to go higher or we might want to go lower, depending on the particular situation or the way that the data come in—and I think routine press conferences will help us make those decisions.

I also think having press conferences meets an international standard. It allows the Chair to guide market expectations on a more regular basis. In my opinion, even when not too much is happening, markets want confirmation that the FOMC thinks that not too much is happening. So I think even in relatively dull times, it's valuable to have regular communication with the markets by the Chair and not just by other members of the Committee. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President Bostic.

MR. BOSTIC. Thank you, Mr. Chairman. I support draft alternative B as written. Though alternatives B and C are nearly identical, I am close to the staff's view on how the public will interpret the additional language in paragraph 2. In particular, my sense is that it would be interpreted as a signal that the Committee is leaning toward raising the federal funds rate more rapidly than what is suggested in the SEP. I think that tempting that interpretation would be a mistake. In that light, I do have sympathy for President Bullard's arguments that he just gave regarding alternative A. Again, I do have concerns about this Committee being perceived as being too "hawkish."

That said, with the economy running as strong as it is, I believe, as does my team, that our policy needs to not be accommodating and that we should get our policy position to neutral. At present, my guess on the neutral policy rate is in the range of 2¼ to 3 percent. After the move today, we will be very close to the bottom of that range.

Depending on how growth and inflation data play out in the coming months, I think it's at least as likely that we will proceed slower than what is in the dot plots as it is that we will raise more rapidly. My current thinking is that real rates will rise as the expansion continues on and that the upper part of the estimated neutral range is our most likely stopping point. But, as I

noted yesterday, the question of where we stop gets very interesting if longer-term rates stall near where they are now. Exactly how flat can the Treasury yield structure be before we are tempting fate?

My staff and I have carefully been following the research done on this issue, especially the work by the staffs of the Reserve Banks and the Board, and we have done some extensions and updates of that work on our own. For now, I feel comfortable with the conclusion that low term premiums justify a flatter maturity structure than has been the historical norm, and that a flattening associated solely with falling term premiums is not an indicator of looming economic weakness.

But that observation begs the question of just how far the federal funds rate can go before it is too far. My staff has noted the same relationship between recessions and near-term Treasury spreads discussed in the Financial Market Developments section of the Tealbook. The causal interpretation of that relationship can, of course, be debated and was yesterday, and it is possible that if causation runs from our decisions to real outcomes, the damage is done by the time the market signals arrive.

These issues feel more and more relevant as we approach the neutral-zone policy rates. Without data suggesting we are highly likely to be “falling behind the curve” on our inflation objective, proceeding cautiously is feeling like the comfortable course for me. At the very least, I think we should, for now, avoid signaling too much precision or certainty about where we are headed. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President Harker.

MR. HARKER. Thank you, Mr. Chair. I support a 25 basis point increase in the funds rate at this meeting. Inflation has been moving toward our target, and the unemployment rate is

very likely below its natural rate. However, I have just one suggestion. The paragraph 2 language in alternative B concerns me somewhat. I realize it's not intended to convey the message that 2 percent is an upper bound or slightly leaky upper bound on inflation. But I think the language would benefit from being more explicit about the symmetric nature of our inflation objective—for example, something along the lines of “The Committee expects that further gradual increases in the target range for the federal funds rate will be consistent with sustained expansion of economic activity and strong labor market conditions, and inflation may move modestly above 2 percent for a time before moving in line with the Committee’s symmetric 2 percent objective.” This is a relatively small change that does, in my view, one important thing. It places additional emphasis on the fact that the Committee is willing to accept a modest overshoot of inflation with respect to our 2 percent objective. Inflation has consistently been below our objective for an inordinate period of time, and it would be useful to underscore that the Committee is as comfortable with modest overshoots as it is with modest undershoots. I worry that the proposed language will be interpreted as an overly strong signal of two additional rate hikes over the course of this year.

On another matter, I would like to reiterate some concerns that I raised at our previous meeting. They pertain to how long we can maintain IOER as a ceiling for the federal funds rate. As the balance sheet continues to normalize, a greater fraction of funds market trades will be between banks, and it will be increasingly difficult to maintain IOER as a ceiling. Further reductions in the IOER relative to the top of the Committee’s funds rate target range will imply that banks will offer Federal Home Loan Banks relatively lower rates, because there will be less surplus to split. Thus, the incentive for arbitrage trades will be reduced, and an already thin market could disappear. As a Committee, we may have to face this environment in the not-too-

distant future, and I think it would be prudent to prepare some options for that eventuality.

Thank you, Mr. Chair.

CHAIRMAN POWELL. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Mr. Chairman. I support alternative B as written. On the basis of my current assessment of economic conditions and the forecasts of my team, I do believe it's appropriate for us to continue the process of removing accommodation at this meeting.

I believe we should be gradually moving toward a neutral policy rate. I'm cognizant of the risk that the longer that we maintain growth above potential, the more difficult it may be to achieve a soft landing. On the other hand, in the medium and longer term, I continue to be very concerned about eroding demographic trends leading to sluggish workforce growth, education and skill levels that are not keeping up with business needs and are contributing to sluggish productivity growth, and the likely unsustainable path of U.S. government debt to GDP.

With that in mind, I'll be closely monitoring economic developments and updating our assessments for 2019 and 2020. This will help inform my views on the appropriate overall pace of increases in the federal funds rate.

As I do this, though, and as we approach neutral, there are some points that I will be thinking about. First, I'm cognizant of the fact that, for me, neutral would mean, after today, three more moves and would occur probably sometime in the spring of 2019 and certainly in the first half of 2019. The first question I'll be thinking about and debating with my team and others around this table is whether the recent fiscal stimulus masking the effect of tightening by the Committee? As the fiscal effect fades and the lagged effects of our removal of accommodation take hold, what will be the effect on economic conditions? Once we get to neutral, do we risk

overdoing it and realizing it too late? And with all of that in mind, I'm cognizant of the fact that monetary policy affects the economy with a lag.

The second point is that I'm also cognizant of the fact that our tools are asymmetrical. And, in particular—especially in light of recent fiscal actions—I ask the question, what tools do we actually have in a downturn when fiscal policy appears likely to be unavailable?

So, with those points in mind, I'm inclined to err on the side of being reluctant to move past neutral, once we get to that point, and to think more about going a little more slowly in the near term. And for me, that means more likely three rate increases in 2018, not four, although I remain open minded about that. But it causes me to want to turn over a few more cards and be continually mindful of the risk that the Fed may overdo it and, because of the lag with which monetary policy acts, we will realize it too late. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President Barkin.

MR. BARKIN. Thank you, Mr. Chair. I support alternative B as well. The economy has evolved as we expected, and, as a consequence, I would advocate continuing on our gradual path to normalization. I applaud the reduction of forward guidance in the statement. It has served its purpose well. As we move closer to neutral, I think we'll value the flexibility to communicate in line with how the economy evolves.

As we go forward, of course, our question will be how long we want to continue on this path. I've struggled with the question of how we'll actually know when we get to neutral when you take into account that fact that our r^* estimates do vary from one another and they each have really significant confidence intervals. I've gotten comfortable, though, with the notion that this gradual path is a practical path. It gives us time and gives us latitude to observe and learn about the health of, and pressures on, the economy as we normalize. And my instinct is to continue on

this path, so long as the economy looks as strong as it does now, and to be open to pausing when we see meaningful signs of weakening. Thank you.

CHAIRMAN POWELL. Thank you. Governor Quarles.

MR. QUARLES. Thank you, Mr. Chairman. I support alternative B as written. Increasing the policy rate at this meeting is consistent with the gradual pace of tightening that I think is appropriate. All of that said, with inflation at target and few signs of imminent overheating, I think we can also be patient in our withdrawal of accommodation.

I also support cutting the forward-guidance language out of paragraph 4. It's efficient. Efficiency is good for the soul. It lowers our word count without loss of clarity. In the near future, I think we'll have to revisit the assertion that "the stance of monetary policy remains accommodative" in paragraph 3. Each hike makes that question riper.

I want to take just a minute to reflect on the pros and cons of characterizing the degree of accommodation in the statement. On the plus side, such statements are a way to increase the transparency of our policy. If we want to be clear and transparent about our strategy, it seems being able to communicate whether we think we are accommodative or tight is a good starting point.

At the same time, I recognize that such statements are complicated by the considerable uncertainty regarding the value of the neutral rate. One dimension of that uncertainty is the dispersion in the projected longer-run rates in the SEP currently. As I said yesterday, I'm relatively optimistic regarding potential GDP growth. As a consequence, I have a higher long-run rate than most of the Committee—maybe everyone on the Committee.

Regarding the dots, a number of participants think that appropriate policy becomes restrictive next year. With the higher long-run rate in my forecast, policy remains

accommodative for longer in my projection, notwithstanding a steeper path of policy rate increases than the median case.

Somewhat more metaphysically—I don't know—uncertainty over the structure of the economy, including the neutral rate, as well as the natural rate of unemployment and potential growth, would seem to favor discretion in policymaking. But discretion in policymaking can exacerbate uncertainty in the economy. It's a bit of a negative feedback loop. So, what I am wrestling with as I get more and more experience on the Committee is my continuing view that, to the degree possible, we have to be careful not to allow our uncertainty over the structure of the economy to lead to uncertainty over our strategy in monetary policy, just as, in my now tired analogy, a pilot cannot allow his uncertainty over the strength of the signal from the radio beacon to translate into uncertainty about the course he has laid in.

One final comment on the symmetry of the inflation target. For me, symmetry means that I am equally troubled by misses below the target as by misses above the target. It does not imply to me that time below the target needs to be balanced proportionately or even a little bit by time above the target. And while I might be equally troubled by being either above or below the target, taking into account the vagaries and volatility of inflation measurement, I have to say that small deviations in either direction do not trouble me very much. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President Evans.

MR. EVANS. Thank you, Mr. Chairman. I support alternative B. The near-term fundamentals for growth are good, and the inflation outlook has improved, although a few questions do remain about whether we're on track to sustainably achieve our symmetric 2 percent inflation target.

For some time, my views of appropriate monetary policy have focused on our need to bolster inflation expectations in order to reach our symmetric 2 percent objective. The Committee's emphasis on gradual increases in the funds rate has been a key element in this strategy, as it allows for a sustained pickup in inflation before policy becomes overly restrictive.

A number of factors suggest this gradual approach is working. The inflation data have improved. Reports received from our contacts point to larger and more broadly spread wage and cost pressures, some of which are being passed through to prices. TIPS inflation compensation has moved up some over the past year, and some tentative Chicago Fed model results suggest that the underlying inflation trend may have firmed a bit recently. Nonetheless, the still-low levels of inflation expectations in household surveys and TIPS pricing remind us that our work is not quite done. Policy needs to stay accommodative for a while longer. This leads me to support maintaining a strategy of gradual rate increases for the foreseeable future. In my SEP submission, I assume today's action and one more policy move this year, thus ending 2018 with the funds rate target range at 2 to 2¼ percent. In Governor Quarles's spirit of full transparency, I'm Number Eight in the SEP.

I think the decision between three or four policy moves this year will be a close call, and I may well support a fourth move, to 2¼ to 2½ percent, if inflation expectations firm more noticeably as we move through the year. But regardless of that exact choice, it's likely we will be nearing a neutral funds rate setting by early 2019. I don't think the rate decisions that get us to that point will prove to be difficult. However, I do think we will need to be careful to prevent the public's rate expectations from rising too quickly. To that end, it is key that the statement continues to say that the Committee expects future rate increases to be gradual. In addition, it might be useful for today's statement to signal that we are not too far from neutral after this

action. We could do that in paragraph 3 by saying that, after this increase, policy remains “only modestly accommodative.” After all, as Governor Quarles said, it’s inevitable that we’re going to have to deal with this issue. We could perhaps do it today.

What about after we reach neutral? Then the choices become much more difficult. In my forecast, I envision that the momentum in the real economy and a recovery in underlying inflation trends will make it appropriate to push the funds rate to a modestly restrictive stance, but not by a great deal—perhaps just 50 basis points or so above neutral. I would then likely advocate a pause in rate hikes, allowing us to assess our progress toward a soft landing. At that point, we should be prepared to adjust policy in either direction, depending on this assessment.

Now, I recognize that mentioning the term “pause” seems really strong. And when I think back to certain sports lessons, when an instructor is trying to get you to do something that’s unusual, they ask for a lot, and they’re happy if you get just a little. So I would say that if, at this moment, we had more of an extended public discussion about being at neutral and what it means and a full assessment of where we are, that might be close enough to a pause if we were to continue to go through—or we might decide that we’ve actually done enough at that point and we need to look more carefully.

Also, we should not worry about some modest overshooting of our 2 percent inflation objective. A little overshooting would have the virtue of helping to firm inflation expectations symmetrically around the 2 percent target. Indeed, if both inflation expectations and statistical measures of underlying inflation trends remain stubbornly low, I could see turning to the strategy in Tealbook alternative A, which aims to overshoot 2 percent by design in order to align inflation expectations with our symmetric objective. I share President Harker’s views that we should

strive to better describe our attitude toward symmetric 2 percent inflation, and I found President Bullard's comments on this also useful.

Yes, I recognize we would have to be vigilant against overshooting too much. But our view that the Phillips curve is no longer accelerationist limits the upside risk to inflation even with an unemployment rate a little below 3½ percent.

In sum, I'm fine with today's rate move. I also suggest we change the language in paragraph 3 of alternative B to describe policy as "modestly accommodative." Looking ahead, I believe the gradual approach to policy normalization will remain appropriate, and I will be even more in a data-dependent mode regarding the exact path of our future rate moves.

I did emphasize "gradual." If you did a word count, I said it five times—six, since I've added it there. [Laughter] Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President Mester.

MS. MESTER. Thank you, Mr. Chair. I support increasing the federal funds rate target range by 25 basis points today, and I'm comfortable with the language in alternative B. The medium-run outlook warrants continued removal of accommodation, and today's action is consistent with that. The economy is already beyond maximum employment, and above-trend growth will push it further beyond sustainable levels. Inflation is near our goal, and I expect it to remain near 2 percent over the forecast horizon.

In this environment, we should be reducing the degree of monetary policy accommodation, consistent with the lessons from the past, the prescriptions of policy rules, and model-based estimates of optimal policy such as those provided in the Tealbook. In this environment of strong growth, the short-run and medium-run neutral interest rate will be rising. This means that, just to maintain the current level of accommodation, the federal funds rate must

rise as well, and, to reduce the level of accommodation, the funds rate must rise more rapidly than the neutral rate.

Estimates of the neutral rate are uncertain, but the gradual pace of rate increases implied by the median path in the SEP suggests that monetary policy will likely not be back to neutral until the second half of 2019—or later, if we consider accommodation coming from the balance sheet. And note that it may be appropriate for the funds rate to move above its longer-run neutral level to ensure our policy goals are maintained.

My policy rate path is somewhat steeper than the SEP median because I think it'll be appropriate to move to neutral more quickly. The median SEP path is flatter than that implied by simple policy rules, the path in the Tealbook, and the path in several private-sector forecasts. My concerns arise in that if we follow the SEP median path, there's a nonnegligible risk we could be falling further "behind the curve." Soft landings are very hard to achieve. In the past, overheating has resulted in poor outcomes. We should take actions to prevent this from happening.

If the economy evolves as expected, I will support further rate increases later this year. Of course, if there's a material change in the outlook, policy would need to respond appropriately. Thank you, Mr. Chair.

CHAIRMAN POWELL. Thank you. President George.

MS. GEORGE. Thank you, Mr. Chairman. I support alternative B as written. Taking steps that further normalize monetary policy is appropriate, in my view, in view of the Committee's objectives for employment and inflation.

Whether we can successfully engineer a soft landing remains to be seen, of course. And, like others, I found the Tealbook box "Alternative View: A Strong but Precarious Projection"

worth considering. Certainly, the analysis highlights how the Committee will need to walk a fine line as labor market conditions continue to tighten and financial conditions become less accommodative.

While most recession indicators remain low today, we will need to watch carefully for evidence that the expansion is running out of steam. But we must also remain watchful for signs of inflationary pressures and financial imbalances. Data dependence of our policy rate path will become increasingly appropriate as the expansion progresses, and, in my view, the changes to the language in alternative B move in this direction to support the Committee's future policy decisions.

Finally, I'd like to join with others in expressing my respect and appreciation to Vice Chairman Dudley for his contributions to and leadership of our work and for his friendship and collegiality. Congratulations as you retire. I wish you all the best.

VICE CHAIRMAN DUDLEY. Thank you.

MS. GEORGE. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President Kashkari.

MR. KASHKARI. Thank you, Mr. Chairman. I support alternative B. I continue to focus on three key indicators—core PCE inflation, inflation expectations, and slack in the labor market. Core PCE inflation is now close to target. We're not quite there yet, but I do believe we're getting closer. Inflation expectations have moved up somewhat. They remain a little bit low, but I think we're getting close. And, finally, slack in the labor market—I continue to think there's still some slack in the labor market, but the headline unemployment rate falling does indicate that we're moving closer to achieving our maximum-employment mandate.

So, in light of this, I think it's appropriate to move toward a neutral policy stance, which is why I support raising rates today. But I will go so far as to say I think, once we get to neutral, we should pause effectively and assess how the economy is unfolding. And the big question mark is, where is neutral? I like to tease President Williams that the Laubach-Williams model is very helpful, but it also offers very, very wide error bars around its estimates. So, for me, this is why I continue to look at and think a lot about the yield curve discussion that we had yesterday.

You know, when I look at where the long-term interest rates are today, I find them notable because they're low by historical standards, we have a lot of fiscal stimulus, we have the balance sheet roll-off, and we're signaling a fairly steep future path of the policy rate. And yet long-term rates are still only at 3 percent. There's information contained in that.

I also look, again, at the yield curve as an indicator not only of a potential recession risk, but to me, it's also a feedback mechanism on where the neutral rate is. So the discussion yesterday of a near-term yield curve versus a long-term yield curve—the near-term yield curve does not feel as helpful to me because I don't think r^* moves around a lot in the short run. If r^* does move around a lot in the short run, so that it would show up in the near-term yield curve, then I find it's not very useful as a policy guide because we're like cats chasing a laser pointer. It's always moving, and we're always “behind the curve.”

So, to me, r^* is a slow-moving concept that's responding to long-term changes in the macroeconomy. So I think the spread between the 2-year and the 10-year rates is going to give us feedback on where neutral is. For example, if we continue raising rates and the long end of the curve moves up because inflation expectations are climbing, or real growth is taking off, that's a good thing, and that'll give us room to raise rates without flattening or inverting the yield curve.

If, on the other hand, we raise rates and the long end of the curve stays pegged at 3 percent, that tells me we're getting close to neutral. And then, whether it itself will trigger a recession or it's correlated with a recession, we need to know going into it, with our eyes wide open, that we are inverting the yield curve and running the risk of ending the expansion ourselves.

I went back through with my staff—I mentioned this yesterday—looking at previous FOMC discussions of the yield curve and term premiums. And people made the point, “Hey, the term premium is low; the yield curve doesn't count this time; this time is different.” They said that long-term interest rates are low, it actually signals easy financial conditions, and this could have a stimulative effect. So we should know if we're making these exact same arguments that previous Committees made before we went into recessions. I just want us to know that.

So the big question is where neutral is, and I think the yield curve is going to be a good indicator.

Last point. There's increasing chatter in the public sphere about a recession in the pipeline. A recent *Wall Street Journal* economists' survey said that 59 percent of the surveyed economists said that 2020 was the most likely date for the expansion to end, and 62 percent of them said the Fed tightening was the most likely cause of that. So, again, I just think we should go in with eyes wide open and make decisions, recognizing the balance of risks. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. Governor Brainard.

MS. BRAINARD. Thank you. It will be challenging to calibrate monetary policy to sustain full employment and re-anchor trend inflation around 2 percent, while adjusting to sizable temporary stimulus at a time when resource utilization is high. I continue to view

gradual increases in the federal funds rate as the appropriate path, although I will remain vigilant for the emergence of risks.

We've seen a roughly 50 basis point increase in longer-term Treasury yields, on net, since the beginning of the year. Even with this increase, the spread between the 10-year and 3-month Treasury yields has declined from about 375 basis points in early 2010 to about 125 basis points currently. Like many of you, I'm attentive to the possibility of inversion of the yield curve. Historically, such inversions have had a reliable track record of predicting recessions in the United States, with one false negative and one false positive in five decades.

To put those numbers in perspective, the current spread is about 20 basis points narrower than the average over the 45 years before the financial crisis. Furthermore, it's helpful to take into account the very low level of the current 10-year yield by historical standards, which, around 3 percent, is well below the average of 6¼ percent during the 20 years before the crisis. Of course, one important reason the 10-year Treasury yield may be unusually low is that market expectations of interest rates in the longer run may be unusually low. But a second reason may be that the term premium has fallen to levels that are very low by historical standards. According to various estimates, the term premium has tended to be slightly negative in recent years.

By contrast, when the spread between the 10-year and 3-month yields was at its peak of 325 basis points in early 2010, the measure of the term premium was close to 100 basis points. With the term premium today very low by historical standards, this may temper somewhat the conclusions that we can draw from a historical pattern seen in periods with a higher term premium. With a very low term premium, any given amount of monetary policy tightening will

lead to an inversion sooner, so that even a modest tightening that might not have led to an inversion in the past could do so today.

One possible contributor to the low level of the term premium may be the asset purchases of the Federal Reserve and other central banks. In fact, a number of studies suggest these policies have been successful in lowering the term premium, which was, of course, a stated goal of our asset purchase programs. Another reason the term premium may be lower than in the past is the change in correlation between stock and bond returns, likely associated with changes in expected inflation outcomes. Although in the '70s and '80s these returns tended to be positively correlated, more recently, the correlation has tended to be negative. This corresponds to an increased demand for long-dated bonds as an instrument for hedging portfolio risks. It's an open question whether that correlation is likely to remain as negative as it has been recently, due to better-anchored inflation expectations following a long period of low and stable inflation, or whether the correlation will diminish as we move further away from the effective lower bound.

If those two factors are taken into account, it seems likely the term premium will increase somewhat, although perhaps not to the high levels seen historically. The continued gradual runoff of the balance sheet of the Federal Reserve—and, ultimately, reduced bond buying by other central banks—is estimated to put upward pressure on the term premium, while this may be counterbalanced in part by diminished expectations of high-inflation outcomes.

In the median outlook in the SEP, the federal funds rate is projected to reach its longer-run value by 2019 and exceed it in 2020. If the 10-year term premium were to stay at current levels, that would, in fact, imply a yield curve inversion. But if the term premium rises as the balance sheet runs off along the lines we've seen in staff estimates, the effect may be to forestall an inversion of the long-dated yield curve.

It's important to keep in mind that the flattening yield curve suggested by the SEP median is associated with a policy rate path calibrated to sustain full employment and inflation around target. So I will, like many of you, keep a close watch on the yield curve as an important signal on how tight financial conditions are becoming. But yield curve movements will need to be interpreted, in the words of President Barkin yesterday, holistically, within the broader context of financial conditions and the outlook, and will be one of several considerations in forming my assessment of appropriate policy.

Related to that movement in the SEP median path, I support the proposed change, embedded in alternative B, that would remove the forward-guidance language that was introduced a few years ago. That language has passed its sell-by date and no longer provides accurate information regarding the Committee's policy reaction function.

I would also hope that, in the not-too-distant future, we revisit the second sentence of paragraph 3. When the unemployment rate was well above its longer-run value and inflation was below its target, it was appropriate to signal that policy was accommodative. As we transition from headwinds to tailwinds, the appropriate benchmark for judging whether policy is accommodative, and how accommodative, will become increasingly murky, as I think the discussion around this table has revealed. It could be confusing to have to decide each meeting whether to describe policy as slightly or modestly accommodative, neutral, or modestly restrictive, for instance. This in turn would require clarifying whether our benchmark for this is the short-run neutral rate, which is how I think about it but which is not reported in the SEP, or the long-run rate, which is in the SEP and, I think, would be a natural thing for others to think about. Instead, I would suggest that we drop this sentence altogether or modify it to indicate that we judge monetary policy to be appropriate to sustain our dual-mandate objectives.

In an environment of tightening resource utilization and above-trend growth, the sizable fiscal stimulus in the pipeline looks likely to provide a boost to demand in the near-to-medium term that should fade somewhat further out. On balance, I believe this outlook is consistent with a gradual pace of increases similar to that in the SEP median. That path may well take the federal funds rate over the medium run above our assessment of its longer-run value. But if so, the main reason would be the temporary fiscal stimulus, which is likely to boost the neutral rate gradually over the medium term but leave little imprint on the longer-run neutral rate. A continued gradual pace is warranted as well in light of the long period of undershooting the inflation target in order to achieve a sustained return to 2 percent inflation.

Finally, in light of recent developments in money markets, I think it would be prudent to clarify the long-term operating framework for our balance sheet sooner rather than later. Recent developments in money markets could reflect a variety of factors, including expected changes in the supply of Treasury bills and changes in the demand for reserves associated with post-crisis regulations or liquidity risk-management practices.

As Lorie discussed yesterday, it is hard to disentangle these different forces, so our understanding of the demand for reserves is likely to remain imperfect. If, as I prefer, the Committee decides to retain a floor system, we may find that we may reach the desired level of reserves sooner rather than later, which would have implications for the duration of our balance sheet runoff plans.

But this, of course, is an issue for another day. For today, I support alternative B. Thank you.

CHAIRMAN POWELL. Thank you. President Williams.

MR. WILLIAMS. Thank you, Mr. Chairman. I support alternative B as written. And if I followed Governor Quarles's comment that efficiency is good for the soul, I might just stop there. Alas, I won't. [Laughter]

Recent data continue to indicate above-trend real GDP growth and exceptionally tight labor markets. Inflation is also within a whisker of our target, and with the labor markets that are strong and expected to tighten further, we should achieve our inflation objective on a sustained basis within a year.

These conditions warrant continuing a steady but gradual removal of policy accommodation by raising the target range for the federal funds rate today. Raising rates today is appropriate, in light of the progress we've already made on our dual-mandate goals and the very positive outlook.

I continue to expect a total of four rate increases for this year. Language in today's statement nicely captures the improvement in economic conditions and the progress we've made in removing policy accommodation. In particular, the removal of references to separate market- and survey-based indicators of longer-term inflation expectations in paragraph 1 appropriately reflects the fact that these measures are now largely in alignment, so such specificity is no longer called for.

Also, the forward-guidance language at the bottom of paragraph 4—namely, that “the federal funds rate is likely to remain, for some time, below levels that are expected to prevail in the longer run”—has grown stale, as a number of people have said. This sentence served us well near the effective lower bound, but with a strong economy and policy normalization well under way, its expiration date has arrived. Furthermore, the straightforward forward guidance in paragraph 2 adequately conveys our current expectations for the federal funds rate path.

These changes in the statement reflect the progress we've made in achieving our goals and in no way suggest a shift in our policy approach or our view of the likely future path of policy. And this message, I think, is particularly important to reinforce in our public communications.

In terms of the second sentence of paragraph 3 that President Evans, Governor Brainard, and others commented on, I do agree that this issue of describing policy as accommodative will become more problematic. I do have a very low view of the neutral rate, so I'm comfortable with keeping that language in now. But I do think that it's going to take quite a bit of discussion in this room, specifically about what do we even mean by this sentence? How do we think about the interplay of our short-term interest rate policy instrument and our balance sheet policy? And, getting back to the point that Governor Brainard made, when you think about "accommodative," how do you think of this, versus other factors that are influencing the economic outlook, like fiscal policy or other tailwinds? That, I think, kind of gets at the short-run/longer-run view of r^* .

So I do think that we need to have a serious conversation about how this language should evolve and when that should happen. I think we're going to have to also have that serious conversation about, how do we understand that? And what purpose will this sentence really serve as we get closer to neutral, whatever that is, and we're really in, I think, more of a data-dependent kind of position in terms of the stance of policy? Thank you.

CHAIRMAN POWELL. Thank you. Vice Chairman Dudley.

VICE CHAIRMAN DUDLEY. I support alternative B as written. [Pause.]

[Laughter]

PRESIDENT WILLIAMS. Who knew?

VICE CHAIRMAN DUDLEY. The case for continuing to remove monetary policy accommodation gradually, I think, remains very compelling, as I said yesterday.

As this is my final FOMC meeting—number 92, as the Chair mentioned yesterday—I thought I’d put in my two cents on some of the longer-term issues that the FOMC will be wrestling with over the next few years. You should take this as evidence that it’s going to be hard for me to let go and step down from the FOMC. As I noted last evening, even though we’re at a good spot in the economic cycle, there remains lots of cool stuff to work on, so I wish I could work on it here.

There are three areas that I want to touch on briefly. First, I think it’s important not to get overly invested in the r^* concept. Not only is r^* unobservable, but it’s likely to move around over time. After all, the rate we really care about is the short-term real rate that applies today that’s neutral, not some time far out in the future. And that’s influenced not just by long-term factors like the productivity trend and demographics, but also by shorter-term ones, including the evolution of financial conditions, the impulse coming from fiscal policy, and the momentum of economic growth abroad. For example, all else being equal, if animal spirits suddenly become more exuberant, causing financial conditions to ease, this should necessitate a somewhat higher short-term interest rate path and vice versa.

Thus, I hope the Committee will not put too much emphasis on another unobserved variable. We already have the natural rate of unemployment, potential GDP, and the GDP gap, which we use in our discussions of monetary policy. I wonder if outsiders might view this musing about a bunch of unobserved variables as a bit daft. [Laughter]

You know, I would judge where neutral is as, it’s not just on the basis of an estimate of r^* —I mean, I think r^* is an interesting starting point—but also by looking carefully, as John

noted, to the data. What are we actually observing? How are things that we observe changing the economic outlook? So, not being too mechanical about what r^* is in terms of guiding the conduct of monetary policy.

The second thing I want to talk about is one of my favorite subjects. I very much hope that the Committee retains the current floor-type system. Not only is such a regime much less complex operationally for the Desk than a corridor system, but I also think it has other really important advantages that are not really widely acknowledged. The most important is that, relative to a corridor system, it allows us to provide better support in maintaining financial stability.

One disadvantage of a corridor-type system is that it can actually constrain the Fed's ability to provide the type of open-ended lender-of-last-resort backstops that can help support financial stability. With a corridor system, the reserve adds from draws on the lender-of-last-resort facilities have to be offset by reserve drains in order to keep the amount of the reserves in the banking system at a sufficiently low level to maintain control of the federal funds rate. This tends to make facilities that are either large, or open ended, unattractive. I think this is one reason why the initial sizes of the term auction facility that we introduced in early 2008 were relatively small.

Perhaps an even better example is the Term Securities Lending Facility, which we introduced in March 2008. It was chosen in large part precisely because it did not add bank reserves to the system. If you remember, in the TSLF, we swapped Treasury collateral for less-liquid collateral, and there was no reserve effect. The primary dealer credit facility only came later, after Bear Stearns got in trouble and was merged with J.P. Morgan.

As a central banker, I wouldn't want to feel constrained in my ability to introduce broad and credible lender-of-last-resort facilities. Private-sector participants are more likely to continue to engage with their counterparties—that is, borrow and lend—when they know a central bank backstop can be drawn on, if economic and financial conditions were to deteriorate. Such facilities are much more feasible in a floor system because there's no conflict between the goals of liquidity provision and maintaining control of short-term interest rates.

The third issue I want to talk about is the open question of whether the FOMC should change its strategic framework in order to mitigate the risk of a return to the effective lower bound on short-term interest rates. Now, some have proposed addressing this by raising the Federal Reserve's inflation objective. And I understand the reasons for that. But I'm not supportive of this for several reasons. Most important, I don't think that a higher inflation target would be viewed as consistent with the Federal Reserve's congressional mandate to pursue price stability. I think we've sort of gotten away with 2 percent. But I think if we push it higher, the Congress would start to balk at that.

Moreover, there may be better ways of reducing zero-lower-bound risks than raising the inflation target. For example, emphasizing the fact that we now have tools, such as forward guidance and large-scale asset purchases, that we would be prepared to use should circumstances warrant their deployment, would help keep inflation expectations better anchored.

A simple alternative might just be to emphasize that we want inflation to average around 2 percent over the medium term. In other words, undershoots of our inflation objective would be offset by overshoots. This would be a move away from our current "bygones" policy, in which we do not attempt to offset misses but, instead, always try to push inflation back to precisely 2 percent. If we move to such a regime, this presumably would help keep inflation expectations

more firmly anchored. This relatively subtle shift in how we talk about inflation might achieve most of the benefits of an explicit price-level targeting regime while avoiding the complexity and the challenges in communication that would surely follow if we adopted a PLT regime explicitly.

You know, I think Chairman Bernanke's suggestion of an asymmetric PLT regime is conceptually attractive, but I think it might be difficult to communicate effectively in practice. In contrast, an inflation regime that aims for 2 percent average inflation over time should be easy to communicate. In fact, we're probably already close to being there with our emphasis that the inflation target is symmetric. We've already sort of moved a little bit in that direction.

Finally, I want to thank everybody for last night's reception and all of the nice comments from Chair Powell and President Rosengren. I want to put a little bit of what I said last evening on the record. I mean, it'll take 5½ years for the record to come out, but I still want it to be there. [Laughter] First of all, I want to thank everybody for being such good colleagues. It's really been a pleasure for me to participate in all of these meetings over the past 11½ years and have the opportunity to collaborate with every one of you. I'm so impressed with the commitment of everybody associated with the Fed to our mission.

Second, I'm confident that you'll continue to do what will need to be done in the years ahead, whether that's adjusting monetary policy to keep the economy on an even keel or responding to the next inevitable—hopefully much smaller—financial crisis. Most important in my mind is the need to maintain the courage of your convictions; to try to anticipate rather than react; to make choices affirmatively when needed—which means acting rather than waiting; and to be willing, regardless of the short-term political consequences, to do what's in the nation's long-term interest. Because I know you will all strive to do this, I'll rest easy. Monetary policy is in excellent hands. Some of the players change, but the chain itself remains unbroken.

I'm very pleased that John will be moving around the table at the next FOMC meeting and will be taking over the reins at the New York Fed on Monday morning. Thank you.

CHAIRMAN POWELL. Thank you, Bill. And thanks to everyone for the discussion. I heard quite broad support for alternative B—more specifically, for a 25 basis point increase in the target range for the federal funds rate.

President Harker, you mentioned an attraction to the language on the overshooting in alternative A. You also mentioned support for alternative B. I didn't take you as proposing that language for consideration at this meeting.

MR. HARKER. No, not necessarily—right.

CHAIRMAN POWELL. Okay. Then I understood correctly. Thank you.

I'd also like to remind everyone that I'm going to be announcing at the press conference today that we'll be moving to having regular press conferences after every meeting, beginning with next January's meeting. The delayed effective date is to make the point that this is about better communication and transparency and that there's no message about the path of policy here. Notwithstanding that, the announcement could easily be market sensitive, so please do remember that it's not publicly known until we start at 2:30.

Let me now ask Jim Clouse to make clear what we're voting on and to read the roll.

MR. CLOUSE. Thank you. The vote will be on the monetary policy statement as it appears on page 4 of Thomas Laubach's briefing materials. The vote will also encompass the directive to the Desk as it appears in the implementation note shown on pages 8 and 9 of Thomas's briefing materials.

Chairman Powell	Yes
Vice Chairman Dudley	Yes
President Barkin	Yes
President Bostic	Yes

Governor Brainard	Yes
President Mester	Yes
Governor Quarles	Yes
President Williams	Yes

CHAIRMAN POWELL. Thank you. Now we've got two sets of related matters under the Board's jurisdiction: corresponding interest rates on reserves and discount rates. As we've discussed, the proposal is to set the rates paid on required and excess reserves at a level 5 basis points below the upper end of the target range for the federal funds rate. This should encourage trading in the federal funds market at rates well within the target range. I first need a motion from a Board member to increase the interest rates paid on required and excess reserve balances. Specifically, the interest rates paid on required and excess reserves would be set at 1.95 percent, effective June 14, 2018. Do I have a motion?

MS. BRAINARD. So moved.

CHAIRMAN POWELL. And a second?

MR. QUARLES. Second.

CHAIRMAN POWELL. Without objection. Finally, I need a motion from a Board member to approve establishment of the primary credit rate by the Federal Reserve Banks of Boston, Philadelphia, Cleveland, Richmond, Atlanta, Chicago, St. Louis, Minneapolis, Kansas City, Dallas, and San Francisco at 2½ percent, effective June 14, 2018. It will also encompass approval by the Board of Governors of the establishment of a 2½ percent primary credit rate by the remaining Federal Reserve Bank, effective on the later of June 14, 2018, and the date such Reserve Bank informs the Secretary of the Board of such a request. The Secretary of the Board would be authorized to inform such Reserve Bank of the approval of the Board of Governors on such notification by the Reserve Bank. Lastly, this vote will also encompass establishment of

the rates for secondary and seasonal credit under the existing formulas specified in the staff's June 8 memo to the Board. I need a motion.

MS. BRAINARD. So moved.

CHAIRMAN POWELL. Second?

MR. QUARLES. Second.

CHAIRMAN POWELL. Without objection. Item 4, "Election of John C. Williams as Vice Chairman, Effective June 18, 2018." By tradition, the Federal Reserve Bank of New York's president is elected by the Committee, and our next item will be that election, effective on June 18. And I think Bill Dudley has a nomination.

VICE CHAIRMAN DUDLEY. I'd like to nominate John Williams to be the Vice Chair of the FOMC, effective June 18.

CHAIRMAN POWELL. Thank you. Any other nominations? [No response] All in favor of electing John Williams as Vice Chairman of the FOMC, effective June 18? [Chorus of ayes] Any opposed? [No response] Congratulations, John, on your upcoming new roles. We look forward to working with you in these roles.

MR. WILLIAMS. Thank you.

CHAIRMAN POWELL. So thank you. Finally, just to confirm that the next meeting is Tuesday and Wednesday, July 31 and August 1, 2018. We've got lunch next door. We've got TV at 2:30. [Laughter] So thanks, everyone. See you soon.

END OF MEETING