

**Meeting of the Federal Open Market Committee on
March 20–21, 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, March 20, 2018, at 1:00 p.m. and continued on Wednesday, March 21, 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
Thomas Laubach, Economist
David W. Wilcox, Economist

David Altig, Kartik B. Athreya, Thomas A. Connors, Trevor A. Reeve, Ellis W. Tallman,
and William Wascher, 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,¹ 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, Brian M. Doyle, and Christopher J. Erceg, Senior Associate Directors, Division of International Finance, Board of Governors; Eric M. Engen and Diana Hancock, Senior Associate Directors, Division of Research and Statistics, Board of Governors

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

Stacey Tevlin, Associate Director, Division of Research and Statistics, Board of Governors

Glenn Follette and Karen M. Pence,¹ Assistant Directors, Division of Research and Statistics, Board of Governors

Eric C. Engstrom, Adviser, Division of Monetary Affairs, and Adviser, Division of Research and Statistics, Board of Governors

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

Etienne Gagnon, Section Chief, Division of Monetary Affairs, Board of Governors

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

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

Anna Orlik, Senior Economist, Division of Monetary Affairs, Board of Governors

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

Valerie Hinojosa, Information Manager, Division of Monetary Affairs, Board of Governors

Meredith Black, First Vice President, Federal Reserve Bank of Dallas

Michael Dotsey, Glenn D. Rudebusch, and Daniel G. Sullivan, Executive Vice Presidents, Federal Reserve Banks of Philadelphia, San Francisco, and Chicago, respectively

Marc Giannoni, Luke Woodward, and Mark L.J. Wright, Senior Vice Presidents, Federal Reserve Banks of Dallas, Kansas City, and Minneapolis, respectively

David Andolfatto, Jonathan P. McCarthy, Giovanni Olivei, and Jonathan L. Willis, Vice Presidents, Federal Reserve Banks of St. Louis, New York, Boston, and Kansas City, respectively

**Transcript of the Federal Open Market Committee Meeting on
March 20–21, 2018**

March 20 Session

CHAIRMAN POWELL. Okay. Let's get started. Welcome, everyone. As usual, the entire FOMC meeting is a joint meeting with the Board of Governors, and I 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, so ordered.

MR. QUARLES. That covers all of it. [Laughter]

CHAIRMAN POWELL. How is it down there in first class, by the way? [Laughter]
But before we start, I do want to say that it is a great honor to be sitting here in this chair today, and I want to thank all of you for your kind comments. I have watched for almost the past six years as Ben and Janet both listened carefully to all perspectives around the table and worked to achieve a consensus on the basis of those views, and I very much hope and plan to continue in that tradition. Finally, I just want to say that I very much look forward to working with all of you in the coming years. With that—

VICE CHAIRMAN DUDLEY. As Vice Chairman of the FOMC, I'd like to welcome you, Chairman Powell. And I think it's going to be "Chairman" Powell in your new role—

CHAIRMAN POWELL. I'll answer to either.

VICE CHAIRMAN DUDLEY. —in leading the FOMC. Although my remaining tenure is admittedly short, I'm very much looking forward to working with you in your new capacity over the next few months. And I know that sentiment is broadly shared around the table.

CHAIRMAN POWELL. Thanks. Thanks very much.

Before we turn to the formal agenda, I just want to remind everyone that there's a reception and a dinner this evening beginning at 5:00 p.m. in the West Court Café. And I will also note that, a little later this afternoon, near the end of the economic go-round, the Board's photographer will come in to take candid pictures for a few minutes. So look sharp, everyone.

[Laughter]

VICE CHAIRMAN DUDLEY. And candid.

CHAIRMAN POWELL. Yes, and candid. [Laughter] Candid and wise. So with that, let's turn to the agenda for the meeting, and we'll begin with the Desk briefing. I'm turning it over to you, Lorie.

MS. LOGAN.¹ Thank you, Mr. Chairman. I'll be referring to the "Material for the Briefing on Financial Developments and Open Market Operations." Early in the intermeeting period, financial markets experienced heightened volatility amid some concerns about the extent to which inflation and interest rates might rise and the unwinding of some strategies designed to profit from sustained low volatility. Fiscal and trade policies were also in keen focus, prompting some notable movements in asset prices. Taken together, these developments implied that broad U.S. financial conditions tightened since the January meeting. As shown in the first column of the top-left panel, equity prices fell and credit spreads widened—largely the result of the volatility last month—and Treasury yields rose, adding to increases over the previous several months. Importantly, however, broad financial conditions remain substantially easier since liftoff in December 2015, as shown in the middle column of the table. I'll begin by discussing these developments, then turn to expectations of FOMC policy, before concluding with an update on money markets and Desk operations.

The next several panels focus on the heightened market volatility at the start of the period. You may recall that equity prices rose sharply over most of January, extending large increases last year, but began to soften a bit at the end of the month as market participants pointed to the ongoing rise in interest rates and the sense that equity valuations had become stretched.

Against this backdrop, and on the heels of a notable upside surprise in wages data the previous trading day, the S&P 500 index declined 4 percent on Monday, February 5, one of its largest single-day declines, and the VIX spiked 20 percentage

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

points, the largest one-day increase on record. As shown in the top-right panel, the notable drop in equity prices coincided with a sharp fall in Treasury yields. The VIX reached 50 percent in early trading the next day, roughly six standard deviations above its average value over the past six years. Equity prices remained volatile and declined sharply again later that week to reach 10 percent below their late-January peak, while Treasury yields largely retraced their declines over the next few days. Many international equity indexes declined on the week, with contacts noting a high positive correlation between equity prices globally.

While liquidity deteriorated in some markets during the episode, the deterioration was generally short lived. A key exception to this was the Treasury securities market. As shown in the middle-left panel, liquidity—proxied here by market depth—fell to below the 10th percentile of its distribution over the past six years and remained below average for a few weeks.

In extensive outreach to market participants, contacts generally attributed the sharp moves to equity market-specific factors rather than a fundamental reassessment of the outlook for U.S. or global growth or inflation. Consistent with this, as shown in the middle-right panel, when asked to rate the importance of various factors in explaining the equity market volatility, Desk survey respondents assigned the highest rating, on average, to “volatility-linked products or strategies.”

Beyond equities, the moves in other risk assets—both domestic and abroad—were more muted, a development that has been seen as reinforcing the interpretation that the volatility was driven by factors specific to the equity markets. That said, survey respondents did rate changes in the inflation outlook as an important factor in the volatility, as shown in the panel, and there remains some debate among market participants about the extent to which concerns over rising inflation and interest rates fed into the equity market declines.

One group of volatility-linked products that received particular attention is VIX exchange-traded products, or ETPs, which allow institutional and retail investors to take positions in volatility. While VIX ETPs are small—with assets under management estimated to have been approximately \$5 billion in late January, as shown in the bottom-left panel—their structures created a negative feedback loop that amplified moves in the equity market. As indicated in the table, some ETPs were forced to respond quickly to the higher volatility on February 5 by buying VIX futures, which served to further increase measures of implied volatility. Dealer counterparties on the other side of these trades in turn hedged their positions by selling equity futures, driving equity prices lower. Contacts suggest that some other market participants anticipated these mechanical rebalancing flows and reduced equity exposures ahead.

Most Desk contacts think the largest quantitative investment strategies—such as trend-following commodity trading advisors, momentum, and risk parity—generally require a longer period of elevated volatility to affect their trading behavior, as indicated by a longer adjustment horizon shown in the table. As a result, these other

strategies are thought unlikely to have been large sellers of equities or traders in volatility in February, though this has been the topic of some market debate.

Desk outreach has suggested that declines in risk asset prices and market liquidity could have been more severe and spillovers greater had volatility persisted and these larger quantitative strategies meaningfully adjusted their positions. As it turned out, the higher volatility was largely contained and transient, with equity market volatility quickly falling back, as shown in the bottom-right panel.

Overall, market participants appear to have taken different messages from the February event. Some think it tested equity valuations and, in view of the quick recovery in prices, are less concerned with valuations than was previously the case. Others, however, worry the short-lived nature of the volatility could breed undue confidence and encourage continued buildup of bets on low volatility. Either way, what the staff were able to learn about the behavior of certain investment strategies has been instructive in understanding how future bouts of volatility may unfold.

Regarding your next exhibit, a focus of global market participants over recent months has been U.S. fiscal policy–related developments, including passage of the tax bill in December and the budget agreement in early February. As shown in the top-left panel, average estimates for the U.S. fiscal deficit as a percent of GDP have increased steadily since December as the final details of the tax package became known and as higher-than-expected spending caps were agreed upon.

In addition, the U.S. Treasury will also have to fund a much larger share of securities maturing in the SOMA over this period. The anticipated large increase in net issuance to the market has contributed to a shift up in nominal Treasury yields over recent months, as shown in the top-right panel. The majority of the increase in longer-dated nominal yields has been driven by rising real yields, as seen in the dark blue bars. Inflation compensation has also risen, as shown in the light blue bars, due to recent firming in inflation data and upward revisions to medium-term U.S. growth expectations. Contacts have also pointed to signals of a more protectionist tilt in U.S. trade policy as contributing to the widening in short- and medium-term breakevens. Though the direct effect of the announced steel and aluminum tariffs on growth and inflation is expected to be small, market participants have suggested that increased uncertainty about the Administration’s future trade policies and an increased likelihood of further protectionist measures have boosted inflation compensation.

As shown in the middle-left panel, this uncertainty also affected currency markets over the period, contributing to moves in the exchange value of the U.S. dollar against the currencies of close trading partners, such as Canada. On net, the dollar appreciated slightly, though the Bloomberg index remains 2 percent weaker year to date and nearly 11 percent below its 2017 high. Market- and survey-based measures continue to reflect expectations of further U.S. dollar depreciation.

In explaining recent movements in the dollar, Desk contacts have increasingly highlighted concerns about widening fiscal and trade deficits and trade policy while

continuing to highlight robust global growth and the eventual convergence of monetary policy among developed-economy central banks as supporting other currencies. While there were limited developments with regard to monetary policy among advanced-economy central banks over the intermeeting period, contacts continue to point to risks associated with less-accommodative policy by the ECB and the BOJ.

Regarding expectations of FOMC policy, since the January meeting, the market-implied path of the target federal funds rate has steepened moderately, as shown in the middle-right panel. In explaining the steepening, contacts pointed to the better-than-expected labor market data, expectations of increased fiscal stimulus, and Federal Reserve communications that were perceived as reinforcing the likelihood of further gradual rate increases. For the past several weeks, the market-implied probability of a 25 basis point increase in the target range at this meeting has been effectively 100 percent. As we look further out, the market is pricing in roughly 75 basis points of total tightening this year and around 35 basis points next year, both modestly higher over the intermeeting period.

Target rate expectations in the Desk's surveys also shifted up a bit. As shown in the bottom-left panel, the majority of respondents now see four 25 basis point increases this year as the most likely outcome, up from three such increases in the January survey. However, while four hikes is now the median modal expectation, as shown in the bottom-right panel, the average probabilities assigned in the surveys to three and four increases are currently very similar, at 32 percent and 30 percent, respectively. Indeed, market discussion about the near-term target rate path is largely focused on whether the Committee will deliver three or four 25 basis point hikes this year. As you can see from the two panels, no respondent sees more than four 25 basis point increases as the most likely outcome, and the average probability assigned to more than 100 basis points of tightening this year is only around 7 percent.

In terms of the SEP, the median survey respondent expects that the median dot for this year will continue to imply three 25 basis point hikes and expects small shifts up in the median dots for 2019 and 2020. However, most respondents see the balance of risks to their projection of the median dot in 2018 as tilted to the upside and expect that the distribution of dots for this year will shift up even if the median does not.

Your third exhibit focuses on money markets, in which developments in fiscal policy have also been a dominant driver. The light blue bars in the top-left panel show realized and projected net quarterly issuance of Treasury bills through 2019. As highlighted by the bar outlined in red, at roughly \$325 billion, the pace of net issuance in the current quarter is anticipated to be the fastest in a number of years. This significant increase is due in part to the passage of the debt ceiling and budget resolution in early February, as well as seasonal cash needs due to tax refunds. Notably, as illustrated by the dark blue line, the amount of bills outstanding is considerably higher going into this period of increased issuance than in previous ones, and it is expected to remain high over the coming quarters.

Consistent with the surge in bill issuance, bill yields rose significantly, even after accounting for firming expectations that the Committee will increase rates, as measured by overnight index swaps, or OIS. You can see this in the top-right panel, which shows the spread between the three-month bill yield and OIS rate.

The sharp increase in supply has spilled over into other money markets. As shown in the middle-left panel, the spread between three-month LIBOR and OIS has also widened significantly, eclipsing levels seen during money market reform implementation in late 2016. Indeed, when asked to rate the importance of various factors in explaining the elevated level of the three-month LIBOR–OIS spread, on average, Desk survey respondents assigned the highest importance to Treasury bill issuance, as shown in the middle-right panel. Repatriation of foreign earnings by U.S. multinational corporates due to recent tax legislation was assigned the next highest importance, on average, as market participants anticipate repatriation to lead to some reduction in short-term U.S. dollar investments. Nearly all respondents rated bank credit risk as an unimportant factor.

As shown by the diamonds in the preceding panel, forward measures suggest that the LIBOR–OIS spread may narrow somewhat over the next few months as pressures arising from the rapid pace of increases in Treasury bill issuance moderates. However, as you can see, the elevated level of the spread is expected to persist due in part to the larger expected supply of Treasury bills in the period ahead.

The higher bill supply and rates also affected overnight money markets. As highlighted by the circle around the red line in the bottom-left panel, the overnight Treasury triparty repo rate has crept higher after trading just above the overnight RRP offering rate since money market reform. At the same time, the additional supply of Treasury securities has kept repo volumes high. Reflecting the plentiful attractive investment alternatives, overnight RRP take-up dropped to its lowest level since the initial testing of the facility, as shown in the bottom-right panel.

We have also observed declines in overnight Eurodollar volumes, which market participants have attributed in part to higher rates on other money market investments. Despite these shifts, the effective federal funds rate and overnight bank funding rate, shown in the dark and light blue lines in the previous panel, remained stable over the intermeeting period, printing at 1.42 percent or 1.43 percent on all days outside month-end.

The top-left panel of your final exhibit summarizes reference rate developments and recent Federal Reserve efforts to support the Alternative Reference Rate Committee’s plan to promote the use of the Secured Overnight Financing Rate, or SOFR, as a replacement to U.S. dollar LIBOR. Recall that Federal Reserve and Treasury OFR staff are working to produce three new repo reference rates and that the ARRC selected the broadest of these rates, the SOFR, as its recommended LIBOR alternative. Over the intermeeting period, the Desk released a statement indicating plans to begin publication of these rates on April 3, and the following day, the CME announced its intention to launch SOFR futures on May 7.

Relatedly, because of the strong interest expressed by market participants in obtaining more historical repo rate data, the Desk released its historical series of the morning survey of primary dealers' borrowing rates in the overnight Treasury repo market. The data extend back to 1998, providing the longest publicly available time series of a given repo rate. There are some important technical differences between this survey rate and the SOFR, but it provides the market with a valuable indicator of the historical behavior of repo rates, and this may help to promote SOFR adoption.

Regarding the SOMA portfolio, the Desk continues to reinvest receipts of Treasury and agency security principal in excess of the Committee's announced redemption caps. Market contacts have not highlighted any significant reaction in Treasury yields or MBS spreads to the increases in caps so far, nor do they anticipate any significant effect to arise from the planned increases next month. For context, as shown in the top-right panel, \$36 billion in Treasuries and \$24 billion in MBS are expected to roll off without reinvestment in the first quarter of 2018. Looking ahead, we anticipate the quarterly pace of the decline will increase through the end of this year, with the portfolio falling to about \$3.9 trillion by year-end.

Finally, a summary of the small-value exercises conducted over the intermeeting period, along with a list of upcoming exercises, is shown in the appendix. After being postponed due to technical issues last year, the Desk successfully executed a securities lending exercise using a backup tool built for resiliency purposes. The Desk also conducted two types of small-value exercises under the foreign authorization that it did not conduct in 2017: placing a euro-denominated callable term deposit with an official institution and the first-ever liquidation of such a deposit. Thank you, Mr. Chairman, that concludes my prepared remarks. I'm happy to take any questions.

MR. POWELL. Thank you, Lorie. Questions for Lorie? Neel.

MR. KASHKARI. Thank you, Mr. Chairman. Lorie, you talked about the vol products. I've had a couple of market participants express concern to me that this reassessment of risk is not over. The comparison was made to me—a kind of hyperbolic comparison—that this is like the Bear Stearns hedge fund blowing up in the summer of '07, and it took months before the extent of that trade revealed itself and how many institutions had taken the same position. How much are you hearing concern that there are more shoes to drop in this vol strategy unwinding?

MS. LOGAN. As I said in the briefing, I think there's some debate in the market, with some finding comfort in what we've seen equity markets do—suggesting that the valuations weren't that overextended—but then others saying that the experience didn't really test the

extent of the low-vol strategies that are out there. So, in the table on the first exhibit, panel 5, the VIX ETPs that were triggered are really small in terms of assets under management, and so the large amount of strategies that might be employing this low-vol strategy weren't really tested because the vol was so short lived.

MR. KASHKARI. Because my impression is, there are a lot of asset managers that have been selling vol insurance and a lot of different portfolios that are not vol strategies, and I just don't know the extent to which they have fleshed out those positions or there's more to come. And I just don't know if you are closer to it.

MS. LOGAN. I think these implicit forms of that low-vol strategy are large, and they weren't tested. So I would say that we still don't know, and if we saw an extended period of high volatility, we could see a much larger move. I think the thing that was unusual in the event that we saw is, because of those VIX ETPs, there was a mechanical adjustment that forced the adjustment very rapidly. And so that really made things look sharp on that day. It's hard to know whether those strategies would have that same mechanical amplification effect.

MR. POTTER. It would be a different world if the VIX was averaging around 30, and there'd be some reasons for that. It's about 17 or 18 right now, which is about the average over the past few years. But I think it would take a bigger move in the VIX to be more persistent. That would change people's view of what the world was like and some of the strategies. The investors themselves would say, "It's a different world. I want to be in a much safer place."

MR. KASHKARI. Thanks.

CHAIRMAN POWELL. President Evans.

MR. EVANS. Thank you, Mr. Chair. Lorie, exhibits 14 and 16 indicate pretty well that many money market spreads have risen since the December FOMC meeting, and exhibit 16

offers the dealer take on some of the explanations. So what is the “takeaway” coming from this—does it suggest that general financial conditions will be persistently tighter than we might otherwise think for the current level of the funds rate target? Any thoughts on that?

MS. LOGAN. I think that, in light of the move in these money market rates, some of those indexes would capture it as being tighter financial conditions, and I think that chart 15 shows that these higher levels are expected to be persistent—not quite as elevated, but still persistent. So I think the answer would be “yes.”

MR. EVANS. Okay.

CHAIRMAN POWELL. Other questions for Lorie and Simon? [No response] If not, I need a motion to ratify domestic open market operations conducted since the January 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. So let’s move to our second agenda item, which is a briefing on the economic and financial situation and the SEP, starting with David Wilcox. David.

MR. WILCOX.² Thank you, Mr. Chair. I’ll be referring to the packet titled “Material for Briefing on the U.S. Outlook.” For those of you who seek solace from your busted brackets, I invite you to contemplate the domestic nonfinancial economy for a few minutes. [Laughter] As you can see from the difference between the black and red lines in panel 1, the near-term spending indicators that have become available since the January Tealbook have been softer than we anticipated. We now expect real GDP growth to average 2½ percent at an annual rate over the fourth quarter of last year and the current quarter rather than the 3 percent pace that we forecast in January. The downward revision to the fourth quarter is mainly due to a larger drag coming from net exports than we had previously penciled in. Joe will have more to say about that in his remarks. In the current quarter, PCE appears to be running at a more subdued pace than we had expected.

Despite the somewhat slower recent pace of real GDP growth, we still see the pressures on resource utilization as having continued to increase in the past couple of

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

quarters. For one thing, even at an average pace of $2\frac{1}{2}$ percent in the fourth quarter of 2017 and first quarter of this year, GDP growth has continued to run above potential growth, which we currently estimate to be at $1\frac{3}{4}$ percent. For another thing, there is the strength in the labor market indicators. Although the unemployment rate held steady, the BLS estimates that private payroll gains averaged a little better than 230,000 per month over the past three months.

Panel 2 provides some evidence that those BLS estimates might not be strong enough. The red line here shows the traditional BLS series. The thin dark line, barely visible to the naked eye, shows a complementary estimate that our team is now able to build up from firm-level employment counts provided to us in real time by ADP, the payroll processing firm.

The main idea behind the exercise is to recognize that even the BLS doesn't have a monopoly on the truth, because their estimate is nothing more or less than an estimate based on a statistical sample of firms. ADP also touches a sample of firms. And although ADP's sample is not a carefully constructed stratified random sample like the BLS's, it does encompass other firms than the BLS hears from and so has the potential to provide additional useful information.

The thick blue line in panel 2 shows the outcome of a statistical exercise to pool the information in the BLS and ADP series. Over the most recent three months, the pooled estimate of private payroll gains has averaged 270,000—40,000 more than indicated by the BLS data alone. Any of these figures—whether BLS alone, ADP alone, or the pooled estimate—substantially exceeds our estimate of the average pace needed to absorb new entrants into the labor market.

Another indicator, of course, of recent labor market strength was last month's jump in the labor force participation rate, not shown in your exhibit. A consequence of that jump was that the employment-to-population ratio moved to its highest level since early 2009, even not taking account of the demographically driven declining trend in that series. Furthermore, initial claims, also not shown, remain historically low, and the job openings rate remains historically high.

All told, and attempting to synthesize the signals coming from all sources—spending, production, the labor market, prices, and wages—we now estimate that output is $1\frac{1}{2}$ percent above potential currently. On our reckoning, this gap has widened nearly $\frac{1}{2}$ percentage point over the past two quarters and is poised to widen at a faster pace over the next several quarters.

Looking to the second half of this year and beyond, we've upgraded our outlook for real GDP growth once again. The upward revision this time primarily reflects our having folded in the implications of the Bipartisan Budget Act of 2018, or BBA, which was signed into law in early February. The law lifts the caps on discretionary spending for just two years—fiscal years 2018 and 2019—by \$300 billion. In putting together our forecast, we assumed that the higher level of spending will be extrapolated forward another three years. At that point, with the debt-to-GDP ratio as

high as it has been since the immediate aftermath of World War II and continuing to rise, we assume that the Congress will begin to enact legislation that gradually brings the budget deficit down to a sustainable level.

Even so, during the next three years, the added federal spending represents another substantial slug of fiscal stimulus. Panel 3 gives you the combined effects that we've built into the forecast for both the BBA and the tax cut enacted late last year. As you can see from the first row of the table, these two fiscal policy changes are projected to add a total of 1¾ percent to the level of real GDP by the end of 2020, with about ½ percentage point of that amount attributable to the BBA.

By the end of 2019, resource utilization is projected to be extraordinarily tight. We have the output gap widening to 3½ percent. If we had followed our usual rules of thumb, the output gap would have been even slightly wider still. If the unemployment rate indeed reaches the lowest level it would have attained since the early 1950s, we think it likely that not all of the incremental output would be forthcoming that one would have expected using our usual rules of thumb. It could be that the incremental productivity of the last workers drawn into the workforce will be lower than the case earlier in the expansion, or that production bottlenecks may begin to emerge. A complementary observation is that some research has shown that fiscal impetus applied when the economy is already operating at or beyond full employment tends to have a smaller effect on production.

For now, the effect that we've judgmentally built in is barely perceptible, mainly meant to serve as an insurance policy against the contingency that yet more forward thrust might unexpectedly be added to the economy. If that were to happen, we would likely build in a more substantial role for supply constraints. But I would hasten to acknowledge that there are risks on both sides. A plausible alternative possibility is that such a tight economy could result in positive hysteresis-type effects that would persistently boost the level of potential output. We illustrated that possibility in one of the alternative scenarios in the Risks and Uncertainty section of the Tealbook.

On net, as I noted earlier, our forecast of the unemployment rate—panel 4—levels out in 2020 at 3.1 percent, one-tenth lower than before. If we had not built in any allowance for bottlenecks and if we had not departed from our usual method of applying Okun's law, we would be coming to you showing an unemployment rate in 2020 of 2.8 percent.

Panel 5 presents the most recent available data on unemployment rates across different racial and ethnic groups. In line with the aggregate measure, the unemployment rates for these groups have moved roughly sideways, on net, in recent months. Notably, the unemployment rate for blacks is close to the lowest level ever recorded for this series. However, as I have mentioned before, no evidence remains of any recent secular convergence in these unemployment rates.

Panel 6 shows four of the measures of labor compensation growth that we follow. We put the most weight on the ECI—the black line—in part because it’s considerably less noisy than the other available measures. The recent behavior of this series is broadly consistent with our view that compensation growth is evolving about as one would expect, in conditions of an increasingly tight labor market, relatively well-anchored inflation expectations, and continued lackluster trend productivity gains.

Panels 7 and 8 summarize the inflation outlook. On net, the recent indicators of core consumer price inflation data have surprised us a little to the upside. The upside surprise was concentrated in medical services and apparel prices. Apparel prices can be quite volatile from month to month, and the miss in medical services inflation appears to have been driven by a strong increase in Medicare payments to hospitals that we do not expect to be repeated. As a result, we haven’t extrapolated any of the recent upside surprise forward.

Over the next few months, we continue to expect that overall PCE inflation will briefly move above 2 percent on a 12-month basis, reaching 2.2 percent by June, and that core inflation will move up closer to 2 percent, reaching about 1.95 percent by June. These upward moves will importantly reflect the blessed anticipated event of the cell phone services reading for March of last year dropping out of the 12-month calculation. [Laughter]

No doubt, the upward movement in overall and core inflation will add to the speculation that you are “behind the curve” in the setting of monetary policy. However, at this point, our best guess is that 12-month core inflation will flatten out right at around 2 percent during the second half of the year, and that a little softness in energy prices will cause topline inflation to edge back below 2 percent.

In sympathy with the small adjustment we made to our real GDP forecast, we made a small allowance in our inflation forecast for the possibility that supply constraints could begin to bind when the unemployment rate moves down to the low 3s. This adjustment manifests itself in an inflation rate in 2020 that’s one-tenth higher than otherwise would have been the case.

Workforce development is already a topic of considerable import and presumably will only become more so if and as the labor market tightens further. Panels 9 and 10 focus on one important dimension of workforce development—namely, educational attainment—using data produced by the National Center for Education Statistics.

As shown in panel 9, the news at the secondary level is pretty encouraging. In particular, a high school diploma is now much more nearly a universally held credential than was the case 50 years ago. In addition, there’s been considerable convergence among the racial and ethnic groups shown here. Back in 1970, the high school graduation rate for blacks aged 25 to 29 lagged that of whites by 20 percentage points. Today it lags by only 3. And the extent of the catch-up achieved by Hispanics in the past 20 years is striking.

At the college level, the good news is more limited. On the one hand, the college graduation rates for blacks and Hispanics have both more than doubled over the time frame shown here. On the other hand, the college graduation rate for whites has gone up by more, leaving the gap in percentage terms wider now than it was 40 and 50 years ago. The most striking aspect of this panel may be the astronomical college graduation rate of Asians.

If panels 9 and 10 portrayed some encouraging progress, panels 11 and 12 will leave us ending on a more somber note. The blue line in panel 11 shows the ratio of the median hourly wage for blacks holding a high school degree relative to the median hourly wage for whites with a high school degree. Forty years ago, that ratio was around 85 percent. Over the decades since then, it has drifted down to 80 percent. Admittedly, this is a simplistic approach to assessing the fairness of the labor market, but if anything it suggests movement in the wrong direction. And, broadly, the same appears to have been true for Hispanics with a high school education.

Similarly, panel 12 shows the wage relatives for holders of a college degree. Two things about this panel particularly catch my eye. First, the general drift again seems to be in the wrong direction at the college level just as much as at the high school level. Second, the wage gaps between blacks, Hispanics, and whites are just as large, even for those with a considerably better educational credential. If, as seems very plausible, these wage gaps reflect a failure to bring blacks and Hispanics fully on line economically, then these gaps may represent another opportunity for increasing the productive capacity of the economy. Joe will now continue our presentation.

MR. GRUBER.³ Thank you, David. I'll be referring to the exhibits in the "Material for Briefing on the International Outlook" handout. Volatility in U.S. equity markets spilled over and elicited sympathetic movements in foreign financial markets. This volatility has left little imprint on our outlook for foreign real GDP growth, however, which, as shown in panel 1, is more or less unchanged from the time of the January meeting. The fourth quarter was a bit softer than we had anticipated, but the misses appeared to be idiosyncratic, and we did not take much signal for the forecast. Recent indicators suggest further momentum, and we expect foreign growth to continue at a solid pace, running at about 3 percent in 2018 before easing back a bit in 2019 and 2020.

Our outlook for foreign inflation is also about unchanged. Euro-area inflation, the blue line in panel 2, continues to run on the soft side and is expected to only gradually edge up toward the ECB's target as resource utilization tightens. Accordingly, we expect the ECB to maintain its accommodative stance, continuing asset purchases through the end of the year and waiting until early 2019 to raise its policy rate, the blue line in panel 3. Persistently weak inflation in Japan is likely to keep Bank of Japan policy highly accommodative, with its yield curve control policy enduring past 2020. The Bank of England provides some contrast. Above-target inflation, boosted

³ The materials used by Mr. Gruber are appended to this transcript (appendix 3).

by past sterling depreciation, has Monetary Policy Committee policymakers adopting a more “hawkish” tone, and we have raised our projection of the policy rate path—the red line in panel 3.

The dollar, shown in panel 4, strengthened a touch over the intermeeting period, breaking its downward trend apparent through much of 2017. As markets adjust to the higher-than-expected path of the federal funds rate embedded in the staff forecast, we expect the dollar to appreciate at about a 2 percent rate through 2020.

The projected rise in the dollar is expected to eventually weigh on export growth, shown in panel 5, offsetting some of the lift coming from solid foreign activity. Imports were unexpectedly weak through much of last year, before a fourth-quarter surge made up most of the difference. The end-of-the-year jump in imports pushed the drag that net exports put on real GDP growth in the fourth quarter to below negative 1 percentage point. With import growth expected to hold up, albeit at a more modest pace, the easing of exports shifts the external sector from being a slightly positive force for GDP growth in 2018 to being slightly negative in 2020.

We do not expect recent trade policy actions to have a meaningful effect on U.S. trade flows—or on overall inflation or activity, for that matter. The steel and aluminum tariffs announced on March 8 cover a relatively small share of U.S. imports, especially with the exemptions made for Canada and Mexico. The effects could become more material if the tariffs led to an escalation of “tit-for-tat” trade restrictions. The EU has released a list of products to be targeted with retaliatory tariffs, but we are not anticipating much effect on the aggregate economy due to these measures either. However, the prospect of further action on the trade policy front is high. For example, the Administration will soon be releasing a decision on a section 301 investigation regarding the treatment of intellectual property in China. We will be carefully monitoring trade developments and continuing to assess the possible effects on U.S. and foreign economic activity.

Turning the page: I will now examine the outlook for the U.S. current account, and global imbalances more generally, following the substantial increase in the projected fiscal deficit since late last year. The U.S. current account, the red line in panel 1, is projected to deteriorate 1¼ percent of GDP through 2020, about ¾ percentage point more than in the December Tealbook before the full incorporation of recent fiscal policy measures into the staff outlook. As you know, the current account balance can be expressed as the gap between domestic investment, on the one hand, and domestic saving—both private and government—on the other. With domestic private saving, the green line, and investment, the blue line, projected to stay roughly flat, the additional foreign funds coming in through the wider current account deficit finance, at least indirectly, the projected deterioration of the general government budget balance, the gold line on the chart. Consequently, our forecast can be viewed as embodying the notion of the twin deficits—the principle that, all else held constant, a decline in the government budget balance leads to a broadly commensurate decline in the current account balance.

Of course, as shown in panel 1, everything else is not always held constant. While the simultaneous widening of the current account and fiscal deficits in the early '80s in the United States gave credence to the twin deficits view, at other times the two deficits have diverged. Notably, in the late 1990s, strong growth contributed to a simultaneous shrinking of the fiscal deficit and widening of the current account deficit.

Looking across countries, we find that the evidence is supportive of a link between the two deficits. The scatter plot in panel 2 relates general government balances, along the x -axis, to the current account balance, along the y -axis, for 33 countries with large current account surpluses or deficits. The plot shows a clear positive and significant relationship between the two. Of course, correlation is not causality, and it could just be that some third factor leads to deficits in both fiscal and external accounts. More robust econometric analysis controlling for other factors results in a positive and significant estimated relationship, but with a smaller coefficient on the government balance.

What are the global implications of widening U.S. fiscal and current account deficits? The wider U.S. current account deficit represents an increased demand by the United States for global savings. So, a critical question for the U.S. and global economy is, to what extent will this increased demand boost the price of global savings and, relatedly, global interest rates?

In thinking through the effect of our heightened demand for foreign saving, we need to also consider factors that might affect the supply of foreign savings. If the global savings glut that has afflicted the world economy for more or less the past two decades persists or even strengthens, increased U.S. borrowing could be accommodated by increased current account surpluses abroad with little rise in rates. However, if the factors that have boosted foreign surpluses begin to abate, the U.S. deficit could indeed put upward pressure on global interest rates.

To investigate which is more likely, I use a simple stripped-down version of a model used in previous work by Steve Kamin and myself to forecast foreign current accounts through 2020. The model relates the current account to demographic trends, economic growth, and government fiscal balances. My approach is to compare the increase in foreign current account surpluses predicted by the model with the increase in the U.S. current account deficit embodied in the staff's Tealbook forecast. The right-side bar in panel 3 shows the results. China, Germany, and emerging Asia are all projected to have large increases in their surpluses, albeit for different reasons. In China, slowing growth should weigh on investment, boosting its surplus. In emerging Asia, unfavorable demographics are the most significant factor. In the euro area, fiscal consolidation plays an important role.

Overall, the model predicts an increase in the aggregate foreign current account surplus slightly larger than the projected widening of the U.S. current account deficit. This suggests a continuation of the global savings glut and the potential for foreign developments to continue to put downward pressure on global interest rates even as

the United States increases its demand for global savings. That concludes my prepared remarks, and I'll hand it off to Etienne.

MR. GAGNON.⁴ Thank you, Joe. I will be referring to the packet labeled “Material for Briefing on Summary of Economic Projections.”

To summarize: Your current projections show stronger real GDP growth and lower unemployment than your December projections. Most of you noted that your revisions reflect, in large part, fiscal developments. A majority of you also made slight upward adjustments to your inflation projections, and almost all of you now see both headline and core inflation modestly above 2 percent in 2020. Consistent with these revisions, most of you raised your projections for the federal funds rate. And although your assessments of the uncertainty and balance of risks surrounding your projections are little changed overall, it is notable that no participant sees the risks to core and headline inflation as tilted to the downside.

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 next are 2.7 percent and 2.4 percent, respectively. The median drops to 2 percent in 2020, a touch above the median of your estimates of longer-run growth. Most of you cited fiscal policy—in particular, the Tax Cuts and Jobs Act and the Bipartisan Budget Act of 2018—as boosting economic activity over the next couple years. Several of you mentioned other factors, including accommodative monetary policy and financial conditions, strength in the global outlook, and continued momentum in the labor market. Indeed, as the second panel shows, the median of your unemployment rate projections declines to 3.6 percent by the final quarter of next year, well below the 4.5 percent median of your longer-run estimates. The third and fourth panels summarize your projections of the rates of headline and core PCE price inflation. For each measure, the median of your projections moves up to 1.9 percent this year and to 2.1 percent by 2020. Several of you noted that the projected firming reflects recent data that support such a projection, a further tightening of resource utilization, and accommodative monetary policy that keeps inflation expectations well anchored. None of you forecast inflation rates above 2.3 percent.

Regarding the top panel of exhibit 2, almost all of you marked up your projections of real GDP growth in 2018 and 2019, though typically by less than the staff. The medians of your forecasts for the unemployment rate, shown in the second panel, are down 0.1 percentage point this year, 0.3 in 2019, and 0.4 in 2020. Although some of you also lowered your estimate of the unemployment rate in the longer run, most of you now see tighter resource utilization over the projection period. As the lower panels show, the medians of your forecasts for headline and core PCE inflation for this year and beyond are either unchanged from December or up a bit. Participants who explained their minor upward inflation revisions pointed to recent price data or to the effects of a stronger outlook. The Tealbook forecasts of real GDP growth and

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

inflation lie within the range of participants' projections. In the case of the unemployment rate, however, the staff projections are lower than every participant's projections. Some of you indicated that your higher unemployment rate path, compared with the Tealbook, reflected the fact that you had reacted less strongly to fiscal developments, expected higher labor force participation, or held more optimistic views about productivity growth or potential output.

Exhibit 3 summarizes your assessments of the appropriate path of the federal funds rate. The median of your latest projections stands at 2.1 percent at the end of this year, 2.9 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. Of note, while the median of your federal funds rate projections for 2018 is unchanged, a majority of you marked up your policy forecasts for this year. The median of your estimates of the longer-run federal funds rate is up $\frac{1}{8}$ percentage point since December. The red diamonds in exhibit 3 show the median prescriptions for the federal funds rate using a non-inertial Taylor (1999) rule, taking as given your individual projections for core inflation and for the unemployment rate, and using your projections for the longer-run federal funds rate as the intercept term. Compared with December, the medians of these Taylor rule prescriptions are up roughly 20 basis points this year, 45 basis points next year, and 90 basis points in 2020.

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 forecast errors in 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 uncertainty as broadly similar to the average of the past 20 years. As in December, most of you see the risks to your projections as broadly balanced. Specifically, for real GDP growth, four participants view the risks as tilted to the upside, and one participant views them as tilted to the downside—the same numbers as in December. In the case of the unemployment rate, the number of participants who see the risks as tilted toward low readings rose from three to four. For inflation, none of you judges the risks to either headline or core inflation as weighted to the downside. The last time when no participants reported a tilt to the downside was April 2012 for headline inflation and June 2008 in the case of core inflation.

Most of you noted that the magnitude and timing of the effects of recent changes in fiscal policy are uncertain or that fiscal developments pose upside risk to real activity. Most of you also cited trade policy as a source of either uncertainty or downside risk. A few of you observed that very tight labor markets—either on their own or in conjunction with fiscal stimulus—posed risks of higher inflation and financial instability, and that the economy could face heightened recession risks as the unemployment rate eventually rises to more sustainable levels.

Your final exhibit shows a fan chart around 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 1.2 to 3 percent at the end of this year and 0.9 to 5.9 percent at the end of 2020. Thank you. That concludes our prepared remarks. We would be happy to respond to your questions.

CHAIRMAN POWELL. Questions?

MR. ROSENGREN. Yes. In my time on the FOMC, I don't think there's been a time when the Tealbook diverged as much from what the participants around the table seem to be saying. When I look at the SEP and compare it with the Tealbook, it's really quite strikingly different. The Tealbook has much more tightening than people around this table do in their SEP submissions. If you put the Tealbook dot into our dot plot, it would, I believe, be the highest dot for each of the years, and the Tealbook has the unemployment rate nonetheless coming in significantly below where the SEP median is.

So I would just be interested in, from the perspective of what you're doing with the Tealbook, where do you think we're being overly optimistic on the outcomes, as we're clearly coming around the table with a very different forecast? As you look at your own forecast—I know we have a limited number of variables, but—how do you think about the divergence between where the Tealbook is and where the SEP is coming out? Because I can remember times when we would do a go-round and everybody would say, “My forecast is exactly like the Tealbook,” and that's not true now. I'd just be interested in the staff's perspective on that.

MR. WILCOX. So let me outline one area in which I think there is essentially no divergence to speak of—and one area in which there's a very strong divergence.

On the funds rate, we did the following exercise: We took the medians of the unemployment rates reported in the SEP—we didn't do this exercise for the March results, but for December. We took the medians of the unemployment rate and subtracted off your longer-run unemployment rates to get an unemployment rate gap. We did an analogous exercise with

the inflation rate. We subtracted off 2 percent to get an inflation gap, plugged that into the inertial Taylor rule that we use in the staff projection—not the non-inertial rule, by the way, which is the one that Etienne was using in his presentation. And, lo and behold, what comes out, to a remarkably close degree, is a replication of the median funds rate trajectory in the December SEP.

So it's dangerous to anthropomorphize 15 people and attribute to them one common framework. However, I'm going to indulge in that for just a second and summarize that exercise by saying that the reaction function that appears to be implicit in your common SEP medians seems to be remarkably close, in this case, to the one that we use explicitly and write down explicitly just as a mechanical process for generating the stance of the funds rate in the staff projection.

Okay. So that's the area that I think is not a source of difference. That makes it all the more remarkable that we have an unemployment rate that is moving as low and as fast as we do in the projection. What it does, in my mind, is highlight just how strong the forward thrust is in the staff projection. Part of that, as Etienne mentioned, may be that many of you seem to have a view that the labor force participation rate is higher. That seems to be true, for example, in the Blue Chip projection. You don't give us that information in the SEP, so we can't verify that for sure. But the submission comments indicate—in the cases of those of you who commented on that—that that is the case.

I summarize it simply with the notion that we have much more forward thrust. The empirical regularity over the past several years is that, in the staff projection, we've had a declining unemployment rate over the medium-term projection, which covers the next two to three years. For each of the past several years, the unemployment rate has outrun us to the

downside. We've had a lower unemployment rate trajectory than the median SEP projection over that period of time. We've all been in the same boat. We've all been wrong. The unemployment rate has outrun all of us—us a little less than you. That's going to stop at some point. Just arithmetically, it will be the case at some point that our perception regarding the unemployment rate turns out to be too low. So I don't know, but that's my case.

MR. ROSENGREN. Just one quick follow-up. So labor force participation would be one area. The other would be that maybe people around the table are assuming much stronger productivity than you're assuming. Do you dismiss that as a possibility?

MR. WILCOX. No, I don't dismiss it. The reason why I sort of close my eyes and take a deep breath is, at the risk of sounding like an economist, it's complicated. And the reason why it's complicated is because it depends on what the nature of the difference in assumptions is regarding productivity growth. Roughly, I can't tell you how it would work in your projections, but what I can tell you is how it would work in our projection.

If we marked up structural productivity growth $\frac{1}{2}$ percentage point, just to name a number, we would tend to mark up actual real GDP growth by the same amount. And the reason for that is simply that implicit in our analytical approach is the idea that even households who haven't had Dornbusch and Fischer in their intermediate macro class would recognize that their income prospects are brighter, and, therefore, they would spend more, and so a version of Say's law would obtain. With stronger structural productivity growth, consumer spending would be stronger as well, and so all of the relevant gaps would be, roughly speaking, maintained as before.

I think it would take a longer sort of Socratic dialogue between the two of us to tease out what the implications of stronger productivity growth are. And would each of you be

envisioning that as a structural matter? In which case, I think—subject to consultation with my colleagues—that would be a valid explanation for the difference in real GDP growth projections, not adjusted for potential, but it wouldn't help explain the difference in the unemployment rate, because a change in the unemployment rate, to a close approximation, is driven by the gap between actual real GDP growth and potential GDP growth.

MR. LAUBACH. If I may just add one point. Logically, another possibility is that, in your projection, the higher path of the federal funds rate exerts a greater amount of restraint than is the case from the staff's perspective. You may remember that, in the past, occasionally I would show you these results obtained from basically trying to invert your SEP submissions to figure out what, according to a simple IS equation, an implied r^* would be. Sadly, I didn't bring that with me to the room this time around. But that was taking one particular view—namely, that embedded in your projections was a different view on what r^* is. However, an alternative, of course, is that you individually have, for example, a steeper slope of the IS curve than what is implicit in the staff's view, so that any given change in the federal funds rate produces a more powerful response of real spending. I'm rephrasing, I think, something already said in different ways. But that's a logical possibility.

CHAIRMAN POWELL. President Evans.

MR. EVANS. Thank you, Mr. Chair. On this last point that Thomas raised—and David used an analysis in which you take the SEPs and you take our individual submissions—maybe a tutorial would be warranted, some kind of memo in which you walked us through some of those calculations in more detail. Maybe it's a research-directors-only kind of—

MR. WILCOX. Let me try it again. It's a pretty simple—

MR. EVANS. No, no, no. No, I can only get so many concepts in my mind. [Laughter]
I appreciate it.

MR. WILCOX. Running up the white flag.

MR. EVANS. My limitation, not yours. I just might as well say that. And on that, I want to thank the staff for thinking very carefully about so many things that are going on right now, with the fiscal stimulus and the way the economy is changing. There is a lot going on.

And I know at the Chicago bank, we really count on looking at how you think about it and bring your own thoughts to this. And so, in light of our conversation last time on the inflation forecast and so many presentations from which my “takeaway” was that with a non-accelerationist view of the Phillips curve, it was kind of hard to get these outsized inflation increases, it seemed to me.

As I looked at the Tealbook forecast this time, I was trying to figure out which elements of what I know are now manifesting themselves in the fact that the inertial Taylor rule is taking us up really high, the unemployment rate is going really low, and inflation is just picking up a little bit above 2 percent by the end of the forecast period. And so, recognizing that there is sort of an unhappy dichotomization in the way the real economy works and how that translates to inflation because of the flatness of the Phillips curve, some of that is being manifest here, I think, in the outlook.

The question I had for myself was, is the very high inertial Taylor rule funds rate trying to keep the unemployment rate from going too low? Or is it trying to keep inflation from going up to 2½ or 3 percent? And I don't think it is the inflation side. But then I looked at page 100, which takes us into the monetary policy strategies and some of the other optimal control exercises, and as you go further out into the forecast period and some of the commentary I think

you mentioned, the unemployment rate in some of these forecasts goes above the natural rate in the “asymmetric weight on the *ugap*” scenario.

I noticed that the one that has a very shallow funds rate path doesn’t really have much action on the inflation rate, and the unemployment rate goes that much lower. So I wonder, what is the feature that is giving rise to that? And is it somehow the fact that unemployment goes above the natural rate more in the out years that has that effect? But that’s a meandering kind of commentary question, as I’m struggling to figure out which of these features are—like the inertial Taylor rule, is it going after the real side more and thinking that inflation is going to come along? Or is it also thinking inflation expectations are headed up?

MR. WILCOX. Okay. Let me try a couple of strands of response, but I am pretty confident I am not going to give you a holistic or well-composed response.

MR. EVANS. That’s fine.

MR. WILCOX. The Taylor rule that underlies the staff projection is not trying to do anything. It is not going after one thing or another. It is merely a mechanical application of a mathematical formula.

Now, quantitatively, the difference between inflation and the 2 percent objective is never large in the projection period. So the amount of variation in the funds rate that is explained by the inflation leg of the dual mandate is never very big in the staff projection. It is not zero, but it is not large.

There are a couple of things to keep in mind. The fluctuation in the funds rate over the projection period mainly reflects the fact that we have sufficient underlying strength in the real economy that output rises to 3½ percent above potential. And aggregate demand is sufficiently

inelastic with respect to the interest rate that it doesn't—the forward momentum is not easily arrested by the early moves in the funds rate, and there is not much of an anticipatory effect.

In our analysis in the baseline, I believe it is the case that, for the most part, there is not a strongly forward-looking element of agents seeing future monetary policy tightening. I say that with a little more tentativeness than other elements. So, by and large, the funds rate fluctuation is being driven by the surge in the economy past what we judge to be its sustainable position.

With respect to the behavior of inflation, I'd offer two brief addendums. One is, keep in mind that there is this concept of trend, or underlying, inflation that we have that is in operation. So in terms of centering our projection, the right center point for the next couple of years is just a little below 2 percent. It's creeping up to 2 percent. It's not literally quite yet at 2 percent over most of the medium term. And the other concept to keep in mind is that we explicitly do not have an accelerationist structure in inflation. So, let's say, the "hot" economy next year, following on a "hot" economy this year, generates no more inflation next year than it had this year. It is not a cumulative kind of process—the anchoring of inflation.

And, I would say, a considerable risk in the forecast is that with the economy operating as "hot" as we anticipate that it will be, those inflation expectations could become dislodged to the upside. We're encouraged that they were not dislodged, by and large, to the downside—at least not in quantitatively significant measure, as best as we can tell. So we haven't built in that kind of unanchoring in the projection, but that's an important thing to keep in mind.

MR. EVANS. Thank you. That's helpful. Sometimes I think I am handicapped by my economist training because I am very sympathetic to what you say about unsustainable output gaps and all of this. But, by themselves, I am not quite sure what the cost of that is, the low unemployment in the 1970s notwithstanding. It is higher inflation or more inefficiencies in the

way the economy is running, but that doesn't seem to be fleshed out. Or another argument that gets raised is, unemployment has got to go back up. And as it does, the risk of going into recession empirically seems to be there. But the inefficiencies—we don't talk about that quite as much around the table as the other features.

MR. WILCOX. There is no attribution in our use of the Taylor rule of costs *per se*. There is no assertion of a value function or welfare loss. And as I've said many times, if and when the Committee wishes to give it to us, we will take dictation from you about a reaction function. The value that I see is having a fixed yardstick from one meeting to the next that will allow you to audit the staff projection in a transparent way, so that you can know—and we can tell you, to the basis point, why it changed this way or that way from one meeting to the next or six meetings hence

MR. EVANS. And I agree with that completely. Thank you very much.

MR. ROSENGREN. So, President Evans, would your view be equivalent to the asymmetric *ugap* in the scenario? What you're describing sounds a lot like the asymmetric *ugap* in terms of how you're processing—there is no cost to having very low unemployment, which is exactly what that scenario is. It's different from the framework we currently have but seems consistent with that. Is that what you're arguing for, or—

MR. EVANS. I was trying to understand the different elements in the material that was being presented to us and how the way I had been thinking about my own outlook might fit into one or the other. I did look at that page and try to puzzle through why it had certain features to it. I'm not quite sure what I subscribe to, to be perfectly honest.

And I think the Taylor rule inertial benchmarking for the forecast—I agree, I think that's really helpful. I do think that probably the strength of it is over an empirical estimation period

that included a time when the inflation rate was higher overall than what we wanted, and so it was probably always trying to push a little bit harder to get inflation down. I'm not quite sure how that plays out here, but there are a lot of different alternatives that were presented, and we benefit from thinking through the implications. Thank you.

CHAIRMAN POWELL. Thanks. President Bullard.

MR. BULLARD. Thank you, Mr. Chairman. Just to follow up on this discussion: It's really not only that the staff is just different from those around the table here, but also the forecasting community at large. And if you look at the comparison between what you guys put in the Tealbook and professional forecasters, the unemployment rate forecast is on the very edge of the distribution of forecasts for the unemployment rate. And then the policy rate forecast is way higher—really out of bounds compared with the professional forecasters. So would you also ascribe idiosyncratic views to that group?

MR. WILCOX. Would I also ascribe idiosyncratic views to that group? Help me.

MR. BULLARD. Well, the professional forecasters are kind of trying to do the same thing you're doing, aren't they?

MR. WILCOX. I don't know. It feels like a loaded phrase to say "idiosyncratic views." We have a different take on the forward thrust of the macroeconomy than the consensus does. You can also see the same point that you're making, President Bullard, with regard to the Blue Chip forecast shown on page 3, in which we're right at the lower envelope of the bottom 10 forecasters for the unemployment rate. And, again, I agree with your highlighting the tension between our higher interest rate trajectory and the lower unemployment rate. I think that's exactly right, as I believe I mentioned to President Rosengren. It only sharpens the extent to which we have a stronger underlying view about the forward thrust in the pace at which

aggregate demand will outrun potential. It's really a statement about how quickly resource utilization is going to tighten.

MR. BULLARD. Well, I'll give you a suggestion that would help me as a policymaker. If you want to put in the Taylor (1999) rule, I kind of agree with the benchmark argument that that gives you a comparison from meeting to meeting. But let's suppose the Committee just does what the market expects us to do over the forecast horizon. Then I think you would say, well, there's going to be more inflation and worse outcomes, I guess, if we follow the market. And I'd like to see what those are compared with following, say, the Taylor (1999) rule.

MR. WILCOX. So, we can certainly do that exercise. I wouldn't say "worse" outcomes, simply "different," because, again, our use of Taylor (1999) inertial is not meant to have a normative content. So if you all are explicitly conditioning your projections on what you would consider to be appropriate monetary policy, we are simply trying to define our economic views on a clear, transparent, and auditable trajectory for the funds rate so that we can trace it mechanically back to the source causes of why it's different now than it was before.

MR. BULLARD. Yes, and just to follow up on that, again, we put the Taylor (1999) rule prescription on the dot plot. I've asked before. I'm not quite sure why we do this. I think maybe the Taylor (1999) isn't that relevant of a benchmark. It might have been at one time, but maybe it shouldn't be the organizing feature of how we think about monetary policy.

Here we've got Taylor (1999) recommending a 4½ percent funds rate today. That sounds high, let's say, but what you could do on this chart is put where the market is and compare us with the market, and that might be something that's kind of informative.

MR. WILCOX. Fair point. We'll take that under advisement. Again, to reiterate, the diamonds on the exhibit on page 3 are for the non-inertial Taylor (1999) rule, which is a very different beast from what we're using in—

MR. BULLARD. And why is that?

MR. WILCOX. Because the incarnation in the Tealbook has an inertial term of .85. And so it really takes a long time for a full response to a change in economic conditions to become manifest in the federal funds rate.

MR. LAUBACH. If I may, briefly—in the case of the SEP chart, we are simply not using a non-inertial rule, because it would be very difficult to apply to your annual projections. One way that you may want to look at this is, even if you disagree with the level of the rule, you may nonetheless think that the change in the rule from one projection to another could be potentially informative. You may have disagreements about the intercept, but you may still want to think about if you applied the coefficients of 1 to the output gap or 2 to the unemployment gap and $1\frac{1}{2}$ to inflation, what that would imply in change space.

MR. BULLARD. Mr. Chairman, just one other follow-up on a related point on the international outlook. If you look at panels 3 and 4 in exhibit 1, this has central bank policy rates over the forecast horizon and then has the broad real dollar projected to appreciate through this period. I've asked the staff before about this, and the appreciation comes because we're going to surprise the market to the upside on the pace of our tightening. But, I would submit, just looking at this chart, that the amount of appreciation of the dollar is not commensurate with the amount of the surprise implied by the FOMC action.

According to this chart, you're talking about, at the end of the forecast horizon, 450 basis points between the ECB policy rate and the FOMC policy rate. And, really, if you look at the dollar chart, it has kind of a mild or no effect on the dollar. So how do we get that?

MR. GRUBER. Mechanically, we're taking into account the market expectation for foreign rates, too. We have the surprises both on the domestic side and the foreign side, and we look at the difference between those two surprises to come up with the appreciation rate.

On the FOMC line, like you point out, the staff has policy rates going up to 5 percent, whereas the market is at about 2½. So we have a big gap there. On the foreign side, it's true that our forecast is actually a bit higher than the market-implied rate. So that's working in the other direction, but not by the same amount of the gap. And so once we combine those two misses in some ways, both between the U.S. side and the foreign side, we come up with the 2 percent appreciation rate, using the historical relationship of these mistakes.

You brought up the point earlier about re-creating the staff forecast using the market-implied path. This is going to be an important area in which we're going to see it today. Most of this dollar appreciation is coming from, as you say, the higher Taylor rule–provided forecast with the market implied path. You put the market-implied path in there, and we've got nothing, really. So the dollar would almost be flat in the forecast, and so that would have some sort of effect on the outlook.

CHAIRMAN POWELL. Vice Chairman Dudley had his hand up.

VICE CHAIRMAN DUDLEY. This is going to be very quick. The market-based interest rate forecast, though, is a very different thing than what the SEP numbers are. The market is not saying this is the optimal monetary policy. They're saying what they think that we're going to do. So I think it's a very different animal. That would be my first observation.

The second observation is, it may be that you're assuming that financial conditions don't react, implicitly, as powerfully to the rise of interest rates as the Taylor rule gives you. I think, if you took a straw poll around the table, and the federal funds rate went to 5 percent, I bet people around this table would probably think financial conditions would tighten quite significantly. So that may be another source of disagreement or difference.

MR. WILCOX. It's hard to run that thought experiment, because—

VICE CHAIRMAN DUDLEY. We don't give you the projections, for one thing.

MR. WILCOX. That's exactly right. In addition, the funds rate is rising to 5 percent in our projection precisely because the unemployment rate is going to 3.1. If the unemployment rate is going to 3.1, then maybe—maybe—our equity price forecast looks more plausible, and maybe investors would say, "Wow, with an economy that's as strong as it has been since the early 1950s, maybe we bid up equity prices." I'm trying to make as soft a claim there as possible, but—

VICE CHAIRMAN DUDLEY. It would be interesting to see what the equity market valuations looked like relative to the level of interest rates you have in your projections and see whether those were elevated on your assumptions. That would be sort of a test.

MR. BARKIN. This would be a great first press conference conversation. [Laughter]

VICE CHAIRMAN DUDLEY. Probably not.

CHAIRMAN POWELL. Well said. Lael has a two-hander.

MS. BRAINARD. It's useful to have some kind of rule in the SEP exhibit as a benchmark, but it's not clear why you have a non-inertial when all of us, I'm pretty sure, put some weight on consistency with our past path. So I would just ask also that you take onboard perhaps instead showing it as an inertial rule, whatever rule is used.

MR. LAUBACH. I can certainly look into that.

CHAIRMAN POWELL. President Kashkari.

MR. KASHKARI. Thank you, Mr. Chairman. David, a quick question. Sorry that we're all piling on you today. It strikes me that one difference—it's only between my outlook and the staff's outlook—is the output gap. I've been surprised by how many people have reentered the labor force, and the staff, I think, is interpreting that as unsustainable, an ever-increasing output gap.

What data would you have to see to change your view to go from unsustainable to sustainable, to actually be, "Hey, potential is higher than we thought"? Is it simply wages and inflation, or is there something else you could look at over time and say, "Okay. Our assessment was wrong. It's not an ever-increasing output gap"?

MR. WILCOX. I think, wages and inflation. You unfortunately took the talking points out of my mouth. We're profoundly aware of the degree of uncertainty in which we are operating. One way to crystalize the extent of that uncertainty is the confidence interval surrounding our estimate of the natural rate of unemployment. In the end, over a lengthy period of time, the definitive test of where the economy is relative to its sustainable location will be nominal wage growth and price inflation.

Now, the sad fact of the matter is that signal is very attenuated, as we've all noted around the table, because, empirically, it appears to be the case that the Phillips curve is very flat, responding very little to movements in resource utilization. And what that means is that the readings on inflation and wages, which inevitably will be buffeted by myriad transitory factors—the signal-to-noise ratio is going to be very low for the natural rate. But, in the end, I think that's the acid test.

CHAIRMAN POWELL. Other questions? [No response] If not, we'll go ahead and start our economic go-round, and we'll do a few before we take our coffee break. So, President Harker.

MR. HARKER. Thank you, Mr. Chairman. Over the intermeeting period, growth in the Third District has moderated. Labor markets appear to be healthy, but we, like the nation, have seen some pullback in residential real estate and consumption. Contacts, especially those in manufacturing, continue to be quite upbeat, and I am anticipating that real growth will pick up over the remainder of the year.

The city of Philadelphia itself continues to outperform most of the region. The District continues to add jobs, and regional unemployment rates have remained constant. However, initial unemployment claims are now lower than in any previous expansion. Nominal wages appear to be growing in the neighborhood of 3 percent despite numerous reports of labor shortages. Thus, we have yet to see real evidence of any significant wage pressures in the Third District.

Regarding manufacturing, contacts remain very optimistic, although tangible measures of growth are, frankly, less evident. Job growth in this sector has been fairly weak, but from a historical perspective, this is actually welcome news. Manufacturers in the Third District have steadily shed jobs over the period from 1990 up to the end of the Great Recession, with over 600,000 jobs lost.

Again, mirroring national surveys, respondents in our March manufacturing survey continue to view conditions quite favorably, with our diffusion indexes well above nonrecessionary averages. Particular strength was evident in new orders, shipments, employment, and future capital expenditures. Additionally, manufacturers are reporting rising

prices, but manufacturing appears to be the only area in which price pressures are apparent. As well, sentiment against the tariff increases is running at 3 or 4 to 1.

Consumption activity has slowed, although automobile purchases remain at high levels. But with very optimistic consumers, healthy job growth, and rising incomes, I anticipate the lull to be temporary. As noted by the Board staff, the weakness is likely due in part to delays in tax refunds.

Regarding residential investment, it appears to have slowed a bit lately, with waning sales traffic at the start of the year. Overall, however, the trend in activity remains positive. Year-to-date total permits have been growing at close to 10 percent, which is somewhat stronger than nationally, and the three-month moving average of contract values for residential buildings hit a new post-recession high. To conclude, although growth in the Third District has tapered a bit, fundamentals remain solid, and I am anticipating some rebound in the second quarter.

Now, regarding the nation, I, like most of you, have upgraded my forecast of economic activity over the forecast horizon. I anticipate a modest stimulus due to fiscal policy and now see near-term real GDP growth of 2.6 percent, with growth gradually declining to 2 percent in 2020.

Although the most recent data on inflation have been a bit more reassuring, I have nudged up my projection of inflation only modestly. I do not anticipate that we will reach our 2 percent target this year, and that inflation will only slightly exceed the target in 2019 before gradually receding back to 2 percent.

Regarding unemployment, I project that the unemployment rate will bottom out at 3.6 percent in 2019 and end up at 3.9 percent at the end of the forecast horizon. That decline is smaller than forecast by the Board staff and is largely due to somewhat slower projected

employment growth and my view that labor force participation will be fairly flat over the next two years. And let me talk about that.

Our staff in Philadelphia has performed a detailed exploration of the cyclical behavior of labor force participation and the cyclical flows of people between employment, unemployment, and nonparticipation. The key drivers are the transition rates between nonparticipation to employment and employment to nonparticipation. It turns out that both of those are procyclical—implying that when the economy is expanding, the rate at which people exit the labor market accelerates, while nonparticipants enter directly into employment more robustly as well.

The first effect tends to pull down the labor force participation rate, while discouraged workers directly finding a job is the largest contributor to increased participation during a recovery. The two effects have tended to be roughly offsetting in the current environment, leading to a relatively flat labor force participation rate. And the offset also helps explain the weak procyclicality seen in labor force participation.

Strikingly, it also turns out that, during a boom, the rate at which unemployed workers drop out of the labor force rises, perhaps because for some, work just simply becomes less necessary. This tends to drive down labor force participation rates when the economy is growing.

Looking through the six different transition rates, the staff at the Philadelphia bank and I project that labor force participation will remain roughly constant over the next two years. However, because the transition from employment to nonparticipation is largely driven by retirement, that secular feature will eventually overwhelm the cyclical factors, and labor force participation rates will again trend lower.

Regarding my view of appropriate policy: a combination of a bit less slack than in the staff forecast and somewhat more concern over whether inflation will eventually surpass our target level leads me to desire significantly more policy accommodation than in, say, the Tealbook baseline. So I view three rate hikes this year as likely appropriate. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President Bullard.

MR. BULLARD. Thank you, Mr. Chairman. I have three main points for today's policy discussion. Number one is that, as a baseline case, I suggest that the Committee think in terms of a growth rate for the U.S. economy in 2018 of about 2.5 percent.

Number two, if the economy surprises to the upside relative to 2.5 percent in a meaningful way—let's say, 3 percent or better—that would be welcome news for the U.S. economy, but the feedback to inflation is exceedingly weak. So such a surprise would only help us get inflation better centered at our target rate of 2 percent.

Number three, the policy rate required to maintain a neutral policy stance is likely below 2 percent in today's environment. In my opinion, moving above 2 percent in the current environment is likely to be restrictive and, hence, begin to put downward pressure on inflation when inflation continues to run below target. In this regard, I note that the market is expecting the FOMC policy rate to top out at about 2½ percent in the 2019–2020 time period, according to Lorie Logan's panel 10 that we just saw.

So let me run through these arguments and give some support for them. Why I assume a 2½ percent growth rate for 2018: In 2017, real GDP growth surprised to the upside, and we ended the year with a 2½ percent Q4-over-Q4 growth rate. The natural prediction at this point, especially with the Committee raising rates, should be that the real GDP growth rate now returns

toward trend—something like what President Harker just mentioned—which the Tealbook puts at 1.7 percent. So that would suggest, say, a 2.2 percent growth rate for 2018, still $\frac{1}{2}$ percentage point above the long-run growth rate.

To that, you may want to add back some growth to reflect current fiscal policy changes now taking effect in the U.S. economy. The Tealbook puts this at a few tenths on the real GDP growth rate per year—and I am happy to accept those estimates, being generous. That gets us back, then, to $2\frac{1}{2}$ percent as a baseline case for 2018 growth.

That kind of number is not too far from the Macroeconomic Advisers' consensus panel, which is at 2.7 percent. One thing you could say is, what are the risks associated with such a forecast? Could something better happen? I think it certainly could, and I hope it does. I do think that there is a possibility that we will see a wave of business investment in the United States, and that could improve U.S. productivity growth, leading to faster real GDP growth. But this type of supply-side effect would not require an aggressive monetary policy response.

On the other side, are there downside risks? I certainly think there are, and I will list three here. Number one, equity valuations are high by traditional valuation metrics, and a substantial revaluation is certainly a possibility. This might then feed into a weakening of consumer and business sentiment. I think that's one risk.

A second risk is that the whole analysis is being thrown off by first-quarter real GDP growth, which now appears to be weaker than expected. The Atlanta Fed and Macroeconomic Advisers' tracking numbers for real GDP growth in the first quarter have both moved below 2 percent. As of this meeting, a 2 percent Q1 means a lot. If you want to get to 3 percent growth for the year, one would need to average 3.3 percent for the remaining three quarters, which in my mind is a tall order, taking into account productivity and labor force trends.

And the third downside risk is trade and tariffs. I agree with the staff in that I do not think that the steel and aluminum tariffs are significant enough to have meaningful macroeconomic consequences. I do, however, think that a brewing trade war with China is a downside risk from a macroeconomic perspective. And I think a consensus is forming in the United States that we have been too accommodating of Chinese mercantilist trade practices for too long and, therefore, that a period of trade disruption may gain considerable political support in the United States. So I think that this is a tangible possibility, and that there may be important macroeconomic consequences down the line.

Now, let's turn to the second point. Suppose the United States surprises to the upside on GDP growth and, by extension, on labor market performance. My question is: So what? The feedback to inflation is miniscule according to recent econometric evidence. In addition, inflation has been running below target, so the U.S. economy surprising to the upside with regard to real GDP growth and labor market performance would only be helpful in getting inflation better centered at our inflation target of 2 percent.

I do think we should switch as a committee to using the Dallas Fed trimmed mean as our measure of underlying inflation. I think it is less susceptible to a one-time price movement like the cell phone prices that are soon expected to roll out of the year-over-year core PCE measure. I think the cell phone price movements are an example in which the core measure is an imperfect means of how to get at the underlying inflation rate in the United States. The core PCE inflation measure is badly outdated. It does not have theoretical backing, as it simply puts zero weight on certain price movements and 100 percent weight on other price movements.

The Dallas Fed trimmed mean is running at about 1.7 percent, year over year. I expect it will move toward 2 percent, provided the Committee does not soon become overly restrictive and start to put downward pressure on inflation and inflation expectations.

I also note that the Tealbook, page 90, has estimates of the probabilities that inflation will exceed 3 percent versus the probability that inflation will be less than 1 percent over the forecast horizon. According to the existing models that we use, the probability of less than 1 percent is actually a greater risk for the Committee as of today than the probability of higher than 3 percent. If we have a symmetric inflation target, I think we should take these numbers seriously.

In the alternative simulations, there is only one scenario to worry about from an inflation perspective, and that is the nonlinear Phillips curve case. In my opinion, there is almost no evidence in favor of a nonlinear Phillips curve. And if it does happen, I think we will have plenty of time to react. That kind of thing takes years to develop, and this Committee is very vigilant on inflation. I don't think we'd get behind the curve on that.

The third point was the idea of the neutral policy rate. I said it is likely below 2 percent, and let me just talk about that for a few minutes. This is probably the leading issue facing this Committee, in my opinion. An expanded version of my remarks on this is available in the slide deck "*r** Wars: The Phantom Menace," which I had to mention. We worked for a long time on that title. [Laughter] It is available on my webpage. I delivered that at the NABE meeting here in D.C. a few weeks ago. The core idea is to divide the real natural rate of interest into three factors like other papers have done—productivity growth, labor force growth, and the global demand for safe assets. And, further—which is different—is to think of each factor as being either in a high mean state or a low mean state, but to refrain from putting additional structure on the analysis, in which case you have to make a lot of additional assumptions.

The evidence in the deck suggests that all of these factors are acting in tandem to keep the natural real rate exceptionally low. This is the end result of a 30-year trend, not a temporary phenomenon. Therefore, we should not expect the real natural rate of interest to mean revert after having declined for 30 years, especially since the three driving factors do not seem to be shifting, based on the evidence available today.

So what that is doing is centering our Taylor rules at very low levels, and we can conduct stabilization policy around those low levels, but we should not be thinking of moving back up to the old levels that they were at in the 1990s or early 2000s. Instead, we should expect the secular forces that drove the natural real rate of interest to this level to continue to exert downward pressure over the forecast horizon, which I think of as a period of about two years for monetary policy purposes.

If we then feed this result into the ubiquitous but unsatisfactory Taylor (1999) rule, which suggests a nominal policy rate setting, taking as given current output gaps and inflation gaps, we will come to the conclusion that the policy rate setting as of this meeting is approximately within the range that would be described as “neutral.” So, according to this analysis, we’re about neutral today, and, even after the presumed policy rate move that we will make at this meeting, we will remain neutral.

But a policy rate setting above 2 percent, conditional on today’s gaps, would start to be restrictive, putting downward pressure on inflation and inflation expectations, according to this analysis. Thus, although we are arguably fine for today, pushing the policy rate substantially higher from here is, as a baseline case, unwise, in my view. We should proceed on such a path only if the economy surprises to the upside in a manner that has tangible implications for

inflation. In a word, we should be more data dependent than we appear to be at this point, a topic to which I will return tomorrow in the policy round. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President Rosengren.

MR. ROSENGREN. Thank you, Mr. Chairman. High-frequency data related to consumption and investment for the first quarter have been slower than I expected. Discussions with businesses in my District as well as the strong underlying fundamentals give me some comfort that this is a pause after a strong second half of last year and not a sign of slower growth that will persist.

One important source of strength—though certainly not the only driver—is the size of the tax cut and increases in government spending enacted as part of the Bipartisan Budget Act. Altogether, taking into account the underlying supporting factors, my forecast is for real GDP to exceed potential by almost 1 percentage point this year and $\frac{1}{2}$ percentage point next year. As a consequence, I expect the unemployment rate to decline by another 0.7 percentage point, roughly consistent with Okun's law. Such a low unemployment rate is outside the range of the economy when not during wartime since World War II. This means that my projections of key economic variables, including inflation, are associated with somewhat more uncertainty.

In terms of my question to David, it reflects my own puzzlement, as my forecast is actually quite similar to the Tealbook's, though not quite as strong. The Tealbook predicts somewhat more real GDP growth after 2018 than I do, and this robust growth occurs despite the Tealbook assumption of six quarter-point increases this year, one more than I am assuming.

The result of the Tealbook's stronger growth is that, rather than leveling off at 3.4 percent, as in my forecast, the unemployment rate declines to 3.1 percent. Indeed, that low of 3.1 would be even lower, as David talked about, had the staff not also assumed a higher

participation rate than implied by their models. The staff assumes that, with extremely tight labor markets, enough people will be drawn into labor markets to limit the implications for the unemployment rate, even though the forecast expects wages to respond only slowly.

Of course, we are talking about forecasts, not outcomes. Relatively small changes in the underlying economic relationships or changes in key conditioning assumptions can cause forecasts to miss in significant ways. For example, the unexpected outcome of a significant trade war or unanticipated changes in the geopolitical situation would, no doubt, alter all of our outlooks.

So where is the Tealbook diverging from private-sector forecasts? At the top level, the Tealbook forecast of real GDP this year and next is not that far from any private forecaster's. Most of these have tended to raise their growth outlook in response to a fiscal policy that is becoming increasingly expansionary even as the economy begins from a position at which we already exceed most estimates of full employment.

When comparing the Tealbook with the Blue Chip, the biggest difference is the path of the unemployment rate, not the real GDP growth rate. While the Tealbook has the unemployment rate falling in 2019 and 2020, the Blue Chip, as summarized by the consensus, levels off at 3.6 percent and then begins to rise. Such an increase in the unemployment rate is achieved with monetary policy set at a roughly neutral stance. The Blue Chip forecasters may be assuming that productivity is now below trend, and that it will eventually revert back to trend. Another possible explanation for the projected increase in the unemployment rate in 2020 and beyond involves a notable expansion in labor force participation that eventually increases the ranks of the unemployed. Perhaps because, in my own forecast, I do not expect a resurgence in

productivity nor significant changes in the dynamics of labor force participation, it is qualitatively more similar to the Tealbook than to the Blue Chip consensus.

One might argue that recent increases in the labor force suggest that labor force participation still has more room to grow. However, when more closely examining the pattern seen in the previous report, most of the increase in the labor force came from fewer people transitioning from employment to not in the labor force rather than from more people leaving the “not in the labor force” category to join the ranks of the employed. In addition, the gains in the labor force were particularly strong in the case of those who had college education. In view of the demographic trends and the already very low unemployment rate among those with a college education, I do not expect that this pattern will persist.

Finally, with regard to inflation, many of my business contacts are beginning to see more price increases in their supply chains. Those businesses with supply chains that cross international borders are seeing bigger increases than they have seen for some time, and they are finding that they need to pass on the increased supply cost to the prices they charge consumers. This anecdotal evidence seems consistent with the firming we are seeing in PCE inflation numbers for measures smoothed over the past three and six months.

With labor markets very likely to continue tightening and more evidence now consistent with a firming of inflation, I expect the market will need to factor in more tightenings this year. If the economy performs more like the outcomes envisioned in the Tealbook forecast, we will need to consider more frequent increases than every other meeting by the middle of this year.

More generally, if one concurs with the forecast that the unemployment rate is expected to significantly overshoot full employment and inflation to revert, to the very least, back to target, it is important to assess whether the monetary policy that would accompany such a

forecast is consistent with the balanced approach outlined in the framework we reaffirmed in January.

It is as if recent monetary policy has been assuming there is no loss emanating from an unemployment rate far below the natural rate, as in one of the Tealbook optimal policy scenarios. I have two concerns about the assumption of a loss function that is asymmetric with respect to labor market outcomes. First, as I mentioned earlier, that is not the framework we outlined and voted on in January. Second, no defense has been given for this change in the objective function. It would be interesting to hear the justifications for this asymmetry of the objective function and also why we have now decided to entertain such an objective function. Thank you, Mr. Chair.

CHAIRMAN POWELL. Thank you. I'm going to suggest that we take our coffee break now, and that we reconvene in modestly above 20 minutes—at 10 after, by that clock. Thanks very much.

[Coffee break]

CHAIRMAN POWELL. Okay. Let's go ahead. Governor Brainard.

MS. BRAINARD. Thank you. Many of the forces that acted as headwinds to U.S. growth in previous years are generating tailwinds currently. The most notable tailwind is the recent enactment of substantial fiscal stimulus that should further boost the economy when it's already close to full employment and growing above its trend rate. We don't have a lot of experience with a procyclical fiscal experiment of this nature, so it's hard to know with any precision how the economy is likely to respond. On the one hand, the anticipated boost to the economy may help to re-anchor inflation expectations at the symmetric 2 percent objective. On the other hand, if the economy continues to expand at the same pace as in recent years, the unemployment rate could soon reach levels we haven't seen in nearly 50 years. Historically,

such episodes have tended to see elevated risks of imbalances whether in the form of high inflation, in earlier decades, or of financial imbalances and perhaps other distortions, in recent decades.

Although real GDP growth appears to have softened in the current quarter, employment growth has remained robust. Growth in the current quarter may be at or below 2 percent, with both retail sales and housing investment registering weak readings, but this may reflect some idiosyncratic factors associated with tax timing as well as the suspected residual seasonality that has weighed on the first quarter for the past few years. In addition, it follows a very strong fourth quarter.

There are good reasons to expect solid growth for the remaining quarters of this year. Consumer sentiment and business surveys remain strong, and payrolls have strengthened from an already expansionary pace. And despite the recent choppiness in financial markets, financial conditions remain supportive of economic growth. Although equity prices are down 4 percent since we last met, they are up more than 25 percent since the end of 2016. Taking into account the usual lags between changes in equity prices and in spending, it's likely the earlier run-up is still feeding into growth. Although the VIX index has moved up notably from our previous meeting, its reading last Friday of around 16 is still below the historical median for this series, which just reminds us how unusually low it had been for a protracted period. Similarly, although corporate bond spreads have widened somewhat over the intermeeting period, they still remain quite compressed by historical standards.

All indications are that the synchronized global expansion remains on track so that conditions abroad will also likely help support growth here at home. But, clearly, it's federal fiscal policy that's projected to provide the most notable boost to aggregate demand over the

next few years. The Bipartisan Budget Act enacted on February 9 increases federal spending \$300 billion over the next two years on top of the \$1½ trillion in personal and corporate tax cuts that were enacted at the end of last year. The Tealbook has the BBA boosting the economy ½ percentage point by 2020 on top of the 1¼ percentage points from the tax cuts, and these estimates are net of the corresponding financial tightening. It's possible that the fiscal effect could be somewhat dampened if the cyclical position of the economy results in a smaller fiscal multiplier for real GDP than might be the case in an economy characterized by more slack—which has been the more customary cyclical position of the economy during previous episodes in which we've seen a substantial fiscal boost.

Even so, in view of the considerable fiscal stimulus in the pipeline, the prospect of very low unemployment rates is very real. The headline unemployment rate may be approaching historically low levels, but the actual level of labor utilization may be somewhat less than the headline figures might suggest. For instance, in comparing today's unemployment rate with that of the 1960s, it's important to take into account the dramatic increase in educational attainment of the labor force over that time. As Andrew Figura has recently pointed out, the share of the labor force that has a college degree or more is around 40 percent today compared with 15 percent in that late-1960s period, and the share having less than a high school degree has fallen from around 40 percent to around 5 percent today. Why does that matter? Well, because the unemployment rates of those who are college educated are typically much lower, around 2.5 percent today, compared with high school noncompleters, currently around 9 percent.

The latest reading suggests that the labor market is robust. Monthly payroll gains averaged 240,000 over the past three months, near the high end of the range of recent years. And while the unemployment rate remained flat, the employment-to-population ratio, which I tend to

focus on, rose 0.3 percentage point to 60.4 percent. It's difficult to know with precision how much slack still remains. Even with the recent move, in the case of prime-age workers the employment-to-population ratio remains 1 percentage point below its pre-Global Financial Crisis level. It's an open question as to what portion of these Americans who are out of the labor force may prove responsive to tight labor market conditions, because this trend of declining labor force participation among prime-age workers predates the crisis, especially in the case of men.

February's employment report provides some encouragement along these lines.

As for the second leg of our dual mandate, the latest readings related to inflation have been somewhat mixed, but I expect to see further progress in the second quarter. Starting with the more positive incoming data, over the past six months, core PCE prices have increased at a 2 percent annual rate over the preceding six months. And after incorporating the latest CPI and PPI data for February, the staff estimates that core PCE prices are increasing at a 2¼ percent rate quarter-over-quarter.

We typically focus on year-over-year changes, however, and I think for compelling reasons. They're less noisy and less susceptible to seasonal adjustment anomalies, and these will take longer to offer the same kind of reassurance. In addition, we've seen strength in inflation readings early in previous years, only to see some weakening in the later part of those years. This pattern suggests that some residual seasonality may be in play. And although readings on longer-term inflation expectations and inflation compensation are little changed since our January meeting, looking back over the past few years, I think that developments here, too, are somewhat encouraging. For instance, 5-year, 5-year-forward inflation compensation is up almost ¾ percentage point since its trough in mid-2016, and after moving down fairly steadily from the middle of 2014 through early last year, readings on inflation expectations over the next

5 to 10 years in the Michigan survey have at least stabilized in recent months. That said, the latest readings on nominal wage gains remain lackluster, and this is true regardless of which series you look at.

So having described the contours of my baseline, let me briefly reflect on some obvious risks. First of all, the fiscal trajectory presents risks on both sides. On one side, there could be a sharp withdrawal of fiscal policy support after two to three years. The personal tax cuts are set to expire, and the stimulus in the BBA is authorized for two years. If the political stars align such that deficit fears are back in focus, it could lead to a very sharp fiscal cliff. Such a large increase in demand followed by a sharp withdrawal could present us with a difficult set of crosswinds as we attempt to navigate a soft landing. On the other side, there's some likelihood that a large portion of today's fiscal stimulus could be extended, and this could raise concerns about fiscal sustainability against the backdrop of an aging population. Interestingly, this theme was quite prominent in my discussions with market participants during the intermeeting period, in particular in their explanation of continued dollar weakness in the face of an unexpectedly large fiscal package.

There may be good reasons to infer surprisingly strong growth abroad as being a key factor behind the depreciation of the dollar over the past year. It's also true that the depreciation of the exchange rate in real trade-weighted terms of around 10 percent represents only a partial unwind of the outsized 25 percent appreciation we saw in the 2015–16 period, perhaps reflecting some classic Dornbusch overshooting dynamics. But U.S. interest rates, both short and long term, have risen by even more than foreign yields, which would typically imply an appreciation of the dollar. And I heard a surprisingly consistent theme of market chatter in connection with waning foreign appetite for the anticipated growing supply of U.S. Treasury securities. So far,

according to staff analysis, this isn't visible in the capital flows data, but it's certainly something I'll be monitoring. And, of course, the drawing down of fiscal space during good times creates a risk there will be less fiscal space to cushion cyclical downturns in the future, which has very important implications for monetary policy.

Finally, a more immediate risk that bears monitoring is an escalation of trade tensions. The deployment of trade remedies has been relatively targeted so far. However, there's a risk that a miscalculation could lead tensions to broaden sufficiently and trigger reciprocal action such that global confidence suffers. This set of developments could derail the synchronous and mutually reinforcing global real GDP growth picture, turning an important tailwind into difficult crosswinds. These risks warrant ongoing vigilance, but, for now, my assessment is that the anticipated tailwinds are likely to deliver further progress toward our goals—a topic to which we'll return tomorrow. Thank you.

CHAIRMAN POWELL. Thank you. President Barkin.

MR. BARKIN. Thank you, Mr. Chair. I see current economic conditions in the Fifth District and the national economy as robust, reinforced by fiscal stimulus and strength in international markets. In this context, the mixed data that we have received recently may simply reflect some payback after the strong second half of 2017.

What's really compelling to us is the strength of business and consumer sentiment. Fifth District surveys are significantly above average and have been so for some time now, and the comments we received from businesses across the District are quite bullish. Our survey of the services sector has over the past year been the most positive since the late 1990s. Our manufacturing survey rose to its second-highest reading ever in February, and over the past four months it has also posted its best performance in two decades. Even in the government-

influenced northern parts of the District, in which things have been softer, the budget deal appears to have boosted confidence. When I was on the Atlanta bank's board in 2011 and 2012, we debated whether the recession aftermath and the Affordable Care Act were unduly depressing investment. You could argue regulatory relief and the tax cuts could do the opposite today and unlock some pent-up demand for capital spending.

Labor markets are tight and getting tighter as you can see in the recent jobs report and comments given by our contacts. The 3.1 percent unemployment forecast—as we have discussed today—speaks volumes. Our sense is that the recent increase in the labor force participation rate, although encouraging, is unlikely to persist. This has been confirmed, in my mind, by recent work in the Richmond Federal Reserve research department, which builds on the Board staff's prior work on the world demographics for the future of participation rates.

As for inflation, I believe for now it's effectively at our target. Monthly inflation has picked up over the past half-year, and the six-month numbers are over 2 percent. Even though inflation has been below target previously, inflation expectations have essentially remained stable. Despite high and increasing resource utilization, I don't fear a significant increase in inflation so long as our actions continue to support stable expectations. I saw, in my "previous life," that anchored expectations are a powerful force in the minds of American businesspeople, who absolutely have a rhythm to pricing that leverages those expectations, and that stays consistent except in times of extreme input price pressure. It's also my sense, on the basis of working with these firms over time, that prices are stickier than we think. The Tealbook box on market concentration was informative, but I think the focus on concentration as a driver of markups is too narrow. Market concentration is having most of its effect by reducing costs so that sellers are able to thrive without increasing prices. Here, I would point to the rising role of

procurement departments, the ability to offshore to lower-cost suppliers, and the reduced bargaining power of labor, which was noted in the box. And more powerful than market concentration is the increase in price transparency. This is having a significant effect on sellers' ability to raise prices even when they face cost pressures. Think Wal-Mart, Amazon, and the internet more broadly. Unless the cost pressure is significant and widely visible—like oil prices or even tariffs—firms are wary about raising prices beyond settled rhythms today because they perceive the risk of share loss as so great. I hope to return to these points in future meetings.

Our SEP submission has real GDP growth and inflation roughly in line with the Tealbook projection. Where we differ most is on unemployment. In our projection, above-trend growth doesn't drive unemployment as low as in the Tealbook, because we see higher productivity growth over the forecast horizon. I believe this to be a reasonable assumption in light of regulatory relief, a potential step-up of capital investment, and how firms behave in a tight labor market. I also understand that this group has been hoping for productivity growth for some time now, and I just may be a fresh face that hasn't yet had my naiveté exposed. [Laughter]

CHAIRMAN POWELL. Thank you. Governor Quarles.

MR. QUARLES. Thank you, Mr. Chairman. I am going to have to start asking to speak earlier, because all the good stuff gets taken by the time you get around to me.

I continue to be optimistic about the economic outlook and even more so since December, when we last filled out our SEPs. Obviously, two significant elements that have emerged since then are the passage of both the tax act and the budget act. I had already incorporated an estimate of the effect of the tax act into my December SEP, and the actual act didn't really change very much my assessment of what the effect was going to be. The boost coming from the budget act has pushed up my projections a little bit further, but my view on the

strength of the outlook is not dependent entirely on the fiscal stimulus. The economy was already quite strong. I think what's driving that is quite broad based. If you look at the recent strength of investment spending, for example, that significantly predated the stimulus. And the stimulus will certainly help, I think, support and extend that, but it was not the driver of that.

Global growth is quite robust and looks set to continue being robust over our forecast period. And then there is the strength of the labor market again, which significantly predated the fiscal stimulus. Now, the implications of that expectation of robust growth for inflation and for the policy rate path significantly depend on whether you're willing to attribute a material portion of that growth to an improvement in the productive capacity of the economy—or is it just a boost in demand? In that regard, I think the budget act was probably mostly a demand stimulus. I do think that there were elements of the tax act that will serve to increase the productive capacity of the economy.

I don't want to make too much of one data point, but obviously I was encouraged by the jump in labor force participation in February. And, more broadly—as others have noted—the participation rate has been flat for quite a while now, notwithstanding the downward pressure coming from demographics. And that suggests that something is going on that has at least some durability, because it has been going on for quite a while. And you would expect, again, that the incentives that are created by the tax act would increase whatever pressure that is. The decline in participation of the workforce is not that well understood. I certainly was encouraged by the fact that the number of people who were out of the labor force because of a disability has recently tended to move down quite rapidly as those people were being drawn in—again, for reasons that defy easy explanation.

And then the point that Governor Brainard made, I think, is very interesting, that the—if you had asked me before looking at the recent data on the changes in the educational composition of the U.S. workforce when that had happened and what had happened, I probably would have said that that shift would have happened about 20 years on either side of the middle part of the 20th century and was largely done by 1970, 1980. And yet the charts that we saw in front of us just here about how that has moved—there has been a significant movement even over the course of the past 20 years in that composition. And half of that 20 years has been the financial crisis and its aftermath, which would have masked or distorted whatever the effect of that change in the educational composition of the workforce would be on the natural rate of unemployment. So there is at least the possibility—I wouldn't call it a hypothesis—but it creates doubt in my mind about where I have set the natural rate of unemployment.

I remember, in my first exposure to macroeconomics back in the middle of the 1970s, we were given the natural rate of unemployment as kind of a constant in the same way that the Taylor rule views the neutral rate of interest. And it was about 5½ percent, and that was a given, and there has been such a change since 1975. Again, in the data we have in front of us—in the educational composition of the workforce—to say that that has only come down 1 percentage point, I have some doubt about that now. That would suggest to me—notwithstanding that I have a very robust view of what the outlook is—that there is probably more room to allow the economy to run than I might otherwise have thought.

On inflation, I think the recent data support the view that the shortfall of inflation in relation to target over the past year was due to transitory factors that were fast fading. Before I joined the Board, I found it anomalous and was skeptical that, in fact, cellular phone prices could have had such an effect on the numbers—but they appear to have had that effect, and that

appears to be rolling out. So I expect inflation to move up to 2 percent on a sustained basis by 2019.

One word on the tariffs, which a couple of folks have mentioned already. I just spent the weekend with Bill and Simon and a group of European globalists who, as sort of a fun house mirror experience, were yearning for the responsible global stewardship of George W. Bush. [Laughter] But it caused me to think back to the imposition of steel tariffs by the Bush Administration and what the effect of that was. It was really extremely similar to the situation in which we find ourselves currently. It was almost exactly 16 years ago. It was March 2002. The steel tariffs were actually somewhat higher. There weren't aluminum tariffs. Canada and Mexico were exempted. The world responded in almost exactly the same way. They took us to the WTO. George W. Bush said he was going to ignore the WTO. The effect on the U.S. economy was negative, but mildly negative. The earth did not get hit by an asteroid. And after a year and a half, the tariffs were removed. And the logic of this situation would seem to me to be quite similar. I mean, the drivers—both the political drivers and the economic drivers—are quite similar. The responses are quite similar. The domestic response is quite similar. So the past is not always prologue, but it is the most recent, quite close analogy that we would have to what the likely implications would be of these tariffs. And so I remain fairly optimistic that the macroeconomic consequence of this will play out in a way that doesn't change my view of the outlook. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President Mester.

MS. MESTER. Thank you, Mr. Chairman. Reports received from contacts indicate that economic conditions in the Fourth District continue to improve at a moderate pace, which has been true for some time. The Cleveland Fed staff diffusion index, measuring the percentage of

business contacts measuring better versus worse conditions, was 37 in March, an insignificant change from January's level of 40. These readings have strengthened over the past two years.

To assess the effect of the changes in the tax code passed last December, the Cleveland staff conducted a special survey of Fourth District firms. About two-thirds of the respondents anticipate a reduction in their tax bills in 2018. Those not expecting savings were mainly nonprofits and S corporations. Although some firms expecting savings have not yet determined how they'll use their gains, over one-third expect to increase investment; about one-third expect to raise employee wages, give bonuses, or add to pension plans; and smaller percentages of respondents plan to buy back shares of stock, increase dividends, or pay down debt.

In response to the recently announced tariffs on steel and aluminum, two steel producers and one aluminum producer headquartered in the District have announced plans to reopen some idle plants and production lines. The potential job increases associated with these reopenings are likely to be fairly small—about 1,000 jobs in the District and an additional 800 jobs elsewhere in the nation. Some District manufacturers indicated they may shift some production overseas to avoid the tariffs. Others expect the tariffs will generate a relatively small increase in overall production cost, which will be offset by corporate tax savings.

District labor market conditions remain strong and steady. The District unemployment rate has held steady at 4.7 percent, $\frac{1}{2}$ percentage point lower than a year ago. The year-over-year payroll job growth in the District has held steady at an above-trend pace of about $\frac{3}{4}$ percent over the past five months. And the Cleveland Federal Reserve staff's wage diffusion index held steady at 53 in March, the highest level in the index's short history. Reports of increased wages for lower-wage occupations were common, with one company raising wages for warehouse workers by 4 to 5 percent. Half of our contacts reported rising nonlabor input costs over the past

two months, and more businesses, including firms in the freight, construction, and manufacturing sectors, report they have been able to pass on cost increases to their customers.

With regard to the national economy, compared with my December SEP submission, I have raised my real GDP growth forecast and lowered my unemployment path a bit. I have lowered my estimate of the longer-run unemployment rate, but the overall narrative in my forecast remains the same. I expect above-trend growth, tight labor markets, and inflation moving back to our 2 percent target over the forecast horizon. Continued expansion of the economy will be supported by favorable fundamentals, including accommodative monetary and fiscal policies, healthy household balance sheets, a strong labor market, and an improving global economy. Although financial market volatility has risen from the very low levels of recent years, financial conditions remain accommodative.

Through the combination of the tax cuts approved in December and the subsequent budget bill, fiscal policy will provide a further boost to the pace of the expansion, and I have edged up my forecast in response. Although the magnitude and timing of the effects of the fiscal stimulus are uncertain, I am estimating that the combined effect will raise Q4-over-Q4 GDP growth $\frac{1}{2}$ percentage point per year over the next three years.

Incoming data suggest a moderation in consumer and business spending early in the year from the strong level seen last quarter. I expect the recent softness to be temporary. Consumer and business sentiment are at or near expansion highs, and disposable and personal income is accelerating. The tax cuts will support somewhat higher business fixed investment and consumer spending. Even if the first quarter comes in on the weak side, I expect it to rebound over the rest of the year, a pattern we have seen over the past two years. I expect growth to be a

bit above 2½ percent over the next two years and then moderate to 2 percent sometime beyond the forecast horizon.

Labor markets remain very strong. Payroll growth strengthened to an average gain of about 275,000 per month in January and February, up from last year's already strong average monthly gain of 180,000 jobs. This pace is well above trend. The unemployment rate has remained steady at 4.1 percent, and the broader U-6 unemployment rate is near its low of the past expansion. Demographic factors, including aging of the population, imply that the longer-run trend in participation is downward sloping, but last month we saw a rise in the participation rate, including that of prime-age males. Indeed, the participation rate of men aged 45 to 54 has shown a notable increase of nearly 1½ percentage points over the past year. Increases in participation help ease some of the tightness in labor supply. However, it's not clear how sustainable these increases will be, in light of the powerful demographic effects weighing on the trend.

Of course, it's difficult to say with any precision how tight labor markets are. Compensation growth has moved up from under 2 percent earlier in the expansion to over 2½ percent more recently, and firms report they are increasing wages and benefits. But the increases aren't as strong as one might expect from the tight labor market, because productivity growth over the expansion has been so low.

The recent increase in participation rates, combined with the fact that inflation and nominal wage growth have remained moderate even as labor markets continue to strengthen, suggests that labor market conditions may not be quite as tight as I have been assuming, so I've reduced my estimate of the long-run unemployment rate to 4½ percent. This, coupled with my upward revision of real GDP growth, led me to lower my unemployment rate forecast compared

with my December projection with the unemployment rate at about 3.7 percent over the forecast horizon.

Incoming data indicate some firming in inflation. In the near term, the year-over-year inflation measures are likely to move up when last March's sharp decline in the price of cell phone service plans falls out of the numbers. This increase is not likely to be sustained. However, reflecting the recent firming in the inflation readings, recently well-anchored inflation expectations, projected above-trend growth, and tightness in labor markets over the forecast horizon, my modal projection is that inflation will gradually rise over the forecast horizon, reaching our 2 percent goal on a sustained basis sometime in the first half of next year. Our control of inflation is sufficiently imprecise that temporary departures from 2 percent are likely, and we will need to average through these when assessing whether we've met our goal.

There are several risks to the forecast, including the magnitude and timing of the effects of fiscal policy and changes in trade policy. Although some businesses will gain and others will lose, the net effect of the steel and aluminum tariffs on the macroeconomy is likely to be small, provided they don't set off increasing rounds of retaliatory tariffs, which would entail downside risk to growth, upside risk to inflation, and a downside risk to long-run productivity by disrupting the efficient allocation of resources. Uncertainty about the outcome of the NAFTA renegotiations is another risk.

Conditional on my outlook, I believe further increases in the federal funds rate over the forecast horizon will be appropriate, balancing the risk so that our long-run goals of price stability and maximum employment are met and maintained. In view of the economy's strength, we don't want to get behind the curve, but we also don't want to overreact to the improvement in the outlook and then potentially curtail the expansion. The gradual path gives inflation time to

move back to our goal, while avoiding a buildup in risks to macroeconomic and financial stability, and it puts monetary policy in a better position to address whatever risks—whether to the upside or the downside—are ultimately realized.

Reflecting my projection of somewhat stronger real GDP growth and stronger labor markets in the later years of the forecast horizon compared with December, my federal funds rate path is somewhat steeper in 2019 and 2020 than in my last projection. I now anticipate that the funds rate will need to stay above 3 percent—my estimate of its longer-run level—into 2020.

Compared with the median path obtained from the set of seven simple monetary policy rules across several forecasts that the Federal Reserve Bank of Cleveland maintains on its public website, my modal policy rate path is similar this year but steeper next year. Compared with the Tealbook policy rate path, my path is flatter than the Tealbook's, especially in the later part of the forecast horizon, because I don't project as steep a drop in the unemployment rate. Of course, there are risks associated with all of these paths, and the actual policy rate path that we follow will depend on how economic conditions evolve.

I want to actually support something that President Rosengren said about the loss function. For a number of meetings, we've been talking about the loss function. We refer to the loss function in the Tealbook. And if we do talk about the goals of monetary policy sometime later in the year in terms of a project, I think talking about the loss function, and where it comes from, and why a symmetric loss function is embedded into many macroeconomic models should be part of that discussion. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President Evans.

MR. EVANS. Thank you, Mr. Chairman. With seven speakers before me, I think I'm the median speaker. Let's see how that goes. [Laughter]

The comments made by my directors and other contacts about current economic activity continue to be upbeat. Wage growth is picking up modestly, and some materials costs are rising. I heard many views regarding how firms expected to be able to pass these costs along downstream. All told, the reports do not suggest notably stronger inflation.

Our manufacturing contacts generally reported strong demand, and we continued to hear occasional comments about supply chain constraints that may limit firms' ability to accelerate production.

Overall business sentiment is upbeat. As one example, United Airlines noted that business travel is very strong, with many last-minute bookings, which they said is consistent with firms eagerly chasing down prospective business deals. And, of course, it's not just the United States that's doing well. Contacts who have a large international presence indicated that demand is strong worldwide. This includes China, where Caterpillar reported that good construction activity is boosting demand for their products.

As you would expect, I heard a lot about the steel and aluminum tariffs and other international trade concerns. In my District, I have both big steel makers and big steel consumers. So I got two earfuls. [Laughter] Of course, steel makers were relatively happy, but they weren't all smiles. One contact expressed uncertainty over how long the current levies would be in place, and Governor Quarles talked about that earlier. The contact reminded me that the steel tariffs of 2002 were announced to be in effect for three years but were rescinded in 2003 after the WTO ruled them illegal, he said. I also heard commentary that the 25 percent tariff rate is too low to deter imports from China. One contact said that pretariff prices of Chinese steel were maybe 60 percent below the breakeven mark for some domestic products. Meanwhile, steel users were resigned to higher materials costs. A few large manufacturers expected they

would be able to pass through higher steel, aluminum, and other readily observable commodity price increases fully to their customers. In contrast, an automaker thought that competition from imported vehicles would require them to absorb a good portion of their higher costs.

More broadly, a number of contacts expressed concern about increased protectionism in the United States and possible retaliatory actions by our trading partners. The status of NAFTA negotiations is a particular source of concern in my District, with its heavy reliance of the automotive supply chain production in Mexico and Canada. That's one example. And, of course, world markets are extremely important to our agricultural producers.

I heard a good deal of commentary about tight labor market conditions again this round. The long running refrain about a dearth of adequately skilled workers continues. But I have heard more reports indicating that drug testing is being reduced or eliminated, when possible. Yet there were only a few reports of larger wage increases, and even those were not outsized. For example, Manpower's latest reading on nominal wage growth in the case of light industrial workers was 3¼ percent. This compares with around 2½ percent a year ago. It seems to me that such wage increases will only exert modest pressure on labor costs. Also, I got the impression that in the current low-inflation environment, some manufacturers thought higher labor costs would be more difficult to pass on to customers than more easily identifiable increases in material costs.

In financial markets, our contacts were pretty sanguine about the recent decline in equity prices and the new higher level of volatility. Most viewed these movements as healthy and long-overdue reappraisals of valuations and risk. No one expressed the view that recent market developments reflected heightened concerns about growth, geopolitical risk, or financial stability. I would note that higher volatility was the main contributor to the recent increase in our

Chicago Fed National Financial Conditions Index. Still, both the overall index and the volatility subindex remain well below their long-run historical averages.

Our contacts also noted the more bullish tone to the inflation narrative in financial markets. Nevertheless, they weren't worried about a breakout in inflation. We heard a variety of reasons for this. Most notably, they didn't see market pricing, including the flat yield curve, as being consistent with long-run inflation expectations at 2 percent, let alone something higher.

For the national outlook, although the incoming spending data have been a bit on the soft side, the fundamentals remain solid. Adding in a good dose of fiscal stimulus, we agree with the Tealbook that real GDP growth this year should be somewhere around the 3 percent mark. Our forecast is premised on a gradual removal of monetary accommodation over the projection period. This, together with the diminishing impulse due to fiscal policy, brings our real GDP growth forecast down to around 2½ percent in 2019 and a bit under 2 percent in 2020. We have the unemployment rate hovering near 3½ percent from late 2018 through 2020. This is 1 percentage point below our estimate of the natural rate.

On balance, the incoming data on inflation have been positive, and inflation appears to be more firmly on an upward trajectory toward our symmetric 2 percent objective. This is good news, but inflation expectations remain too low. Taking a longer perspective, I note that the welcome updrift in TIPS breakevens over the past year and a half has only retraced about half of the decline that occurred in 2013 and 2014, and most survey measures remain near all-time lows. I will discuss my specific policy strategy tomorrow, but it's safe to say my SEP submission has a pretty shallow path of the federal funds rate—substantially less aggressive than in the Tealbook. In my outlook, I think this very gradual pace of policy adjustment to a neutral setting is needed to solidify inflation expectations symmetrically around 2 percent. We cannot be confident that

we will achieve our inflation objective on a sustainable basis until we're confident that we have reestablished such a distribution for inflation expectations. Assuming this realignment in expectations, and reflecting the pressure on resources generated by our real-side forecast, I see core inflation rising to a bit over 2 percent by 2020. Of course, like most everyone around the table, I've made such forecasts before. We hope this time it will be right. [Laughter]

Now, Mr. Chairman, up to this point, my federal funds rate path comments have been about their importance for my outlook. So I think that's playing according to Hoyle. But I would like to conclude with a break in protocol and make a very quick policy comment during this round, if that's okay.

Regarding my SEP submission, I feel a lot like my alma mater, the University of Virginia. I'm number one this round [laughter], and I don't expect to advance my dot much further. Thank you.

CHAIRMAN POWELL. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Chairman Powell. I hope Kansas does better. [Laughter]

The Texas economy continues to grow at a strong pace. We expect job growth to be approximately 3 percent in 2018, and the state's unemployment rate of 4 percent is near a multidecade low. Growth is being fueled by strength across a broad range of industries, including a continued pickup in the energy sector. We believe—as we've said before here—that the United States will increase oil production this year by as much as 1 million barrels a day. We think 70 percent, approximately, of that growth will come from shale in the Permian Basin.

Labor shortages are the biggest constraint we see to energy production growth in 2018, and labor shortages are also, we think, the biggest constraint to growth across industries in the State of Texas this year. Up to that point, 61 percent of our small business survey respondents—

these are companies with less than 500 employees—report they are struggling to find low-skilled and mid-skilled workers. They report using higher wages, bonuses, and search firms to improve their ability to fill open positions. An increasing, although still modest, percentage of our survey respondents report they are increasing prices.

I would contrast this with discussions with larger companies in a variety of industries who also comment on, particularly, raw material prices being higher for them in a number of industries we cover. But they're also saying, again, that they have very little pricing power, consistent with what President Barkin said. The dynamic varies by industry, but one example in the consumer industry is the Amazon price crawler, which a number of big company CEOs refer to, which in real time reprices Amazon-offered goods to the lowest price. And—what's hard for people to get their arms around—it does it instantaneously, in real time. Most of these companies are struggling to have any pricing power against that, and, in fact, what they are talking about is sort of restructuring their goods offerings so that the crawler won't pick them up. And what they're doing to respond to this also has reduced their cost—as President Barkin said—and increased scale.

We had a global energy conference two weeks ago hosted by Cambridge Energy. It's basically the Davos of energy. It's every year in Houston. I was there this year. My main “takeaway” from the conference is that the energy market is in a fragile equilibrium for the next two or three years, consistent with our discussions here. That is, shale production growth will be able to supply incremental global demand over the medium term.

I'm even more convinced on the basis of discussions held at that conference that, because of the rapid decline curve of shale—as one executive described it—it's like walking up a down escalator: The more you produce, the climb curve is so fast you have to produce that much

more. They're doubtful that shale will be sufficient over the next three to five years to keep up with global demand, which has now been marked up to grow at 1.5 million barrels a day. And because there has been an absence of long-lived investment in the energy business now for several years, the risk of global undersupply is very real, even with growth in alternative energy. And so we believe three to five years from now there is a real oil price risk to the upside. The reason we emphasize this point is the obvious broad-based effect of a price spike in gasoline and its ripple effects through the U.S. economy. And we will continue to watch this closely.

As far as the U.S. economy goes, we forecast real GDP growth at between $2\frac{1}{2}$ and $2\frac{3}{4}$ percent in 2018. This growth is underpinned by a strong U.S. consumer, firming business investment, and better-than-expected non-U.S. economic growth. We also believe the recent tax legislation and budget deal will add to real GDP growth this year, as many others have said. We expect that headline unemployment will dip to 3.6 percent during the year, and U-6 will also dip below its current 8.2 percent level. Like many others, we also believe that the labor force participation rate is very unlikely to move materially higher than 63 percent. We do believe the Dallas trimmed mean inflation rate is likely to drift up to about 1.9 percent by the end of 2018. As we look to 2019 and 2020, we, like many others, see real GDP growth decelerating and ultimately being somewhat below 2 percent by 2020. We are very concerned about an aging workforce and sluggish productivity growth.

We spend a lot of time in Dallas thinking about where we could be wrong and where there could be more labor slack than we're seeing. We've had a lot of discussion about the millions of potential workers who are not in the workforce because of disability claims—as Governor Quarles mentioned—and we also talked a lot about the millions of workers who were previously incarcerated who have a labor force participation rate substantially below the U.S.

average. We will continue to look at those things, hoping that we might see some movement that will mean there's more supply than we think there is.

Regarding productivity, we continue to be highly concerned that 46 million participants in the workforce have a high school education or lower, and we continue to expect that technology-enabled disruption will cause many of their jobs to be restructured or eliminated. And while skills training capability is improving in the United States at high schools and at junior colleges, we believe it is not nearly keeping up with the need to retrain and train members of the workforce. We also cite data that suggest the United States is lagging, in terms of educational attainment behind other OECD countries. This is particularly true among the fastest-growing demographic groups: blacks and Hispanics. Unless the United States does more to improve skills training and improve early childhood literacy—math, reading, and science achievement levels—the human capital capability of our workforce may not be sufficient to translate automation and better business investment into higher levels of overall productivity in the U.S. workforce. That, unfortunately I think, is our base case right now.

Our surveys as well as discussions with industry contacts suggest that business optimism is very high. Companies we speak with are planning to take advantage of new tax rules for expensing cap-ex and are moving forward plans to make those expenditures. It's not clear, though, that these new tax rules are encouraging companies to increase capital spending materially. It looks to us, on the basis of most of our discussions with contacts, that they're simply pulling future cap-ex into this year and maybe next year.

Many companies that we speak with are also citing explicit plans to use investment and automation to replace workers and drive down the size of their workforce relative to output. Many of these discussions are motivated by the lack of pricing power.

And, I must say, in recent discussions, I've noticed that company CEOs are recently cognizant of the fact that, although the recent tax legislation and budget stimulus is helpful in the short run, they're increasingly cognizant of the future path of U.S. debt growth and the fact that the U.S. economy is far more interest rate sensitive than it might have been in previous periods, especially at this point in the cycle. And I'm finding that's causing a number of CEOs I talk to to be simply cautious about their spending plans, because they're worried about this increasing interest rate sensitivity in the U.S. economy.

A last comment regarding trade: I recently spent time with the new central bank head in Mexico, as we do regularly. As you know, the federal funds rate equivalent in Mexico, which they refer to as the interest rate target for overnight funding operations between banks—that's their term—now stands at 7½ percent. Currency weakness and volatility after the U.S. November 2016 election caused the central bank to raise its policy rate aggressively, in order to address inflation pressures. Obviously, we all know there's great continued uncertainty regarding NAFTA, but I don't think enough attention is being paid to a bigger uncertainty—a more troubling one—which is about the July 2018 presidential election in Mexico. There's a growing concern that the rhetoric flowing between the United States and Mexico is going to increase the likelihood of a candidate being elected who is far less constructive on U.S.–Mexico relations and, by the way, far less constructive about the renegotiation of NAFTA.

Now, you may know right now that these negotiations are going to put on hold. So if we can get something done between now and then, that would be great. But if it gets put on hold, I wouldn't assume that, after the election, our opportunity to renegotiate this deal with Mexico is going to get better. It looks to us like it will likely get worse. The new government, if it's a far-left government, is going to be less supportive of economic reforms, reforms of the energy

industry, and other modernization actions that have been executed by the current government. Because of the critical importance of logistics and supply chain arrangements between the United States and Mexico—which we believe improves U.S. competitiveness and adds U.S. jobs—we are obviously closely monitoring this situation. Thank you, Chairman Powell.

CHAIRMAN POWELL. Thank you. President George.

MS. GEORGE. Thank you, Mr. Chairman. The District economy remains strong except for the agricultural sector, and concerns on the part of our business contacts about labor market tightness have intensified. Both our manufacturing and services surveys continue to indicate strong activity, and expectations regarding future growth are solid. Plans for capital spending have increased significantly in recent months. In particular, cap-ex plans for the District's manufacturing sector so far this year are at their highest level in the 24-year history of our survey due in part to the recent tax legislation. Our energy contacts also report more drilling, more completions, and more production at current prices. Despite this optimism, we did hear concern about steel and aluminum tariffs. Input prices are expected to rise, causing existing contracts to be renegotiated, particularly in the manufacturing and construction sectors. In the agricultural sector, credit conditions have stabilized somewhat, based on surveys of District bankers. However, there are few signs of improvement, with farm income expected to decline slightly in 2018.

Turning to the national economy, I continue to see solid fundamentals supporting above-trend growth. While core retail sales increased only modestly in February, the underlying details of the report suggest consumer demand was better than the headline figure would suggest. For example, spending on a number of discretionary categories increased quite robustly, and nonstore retail sales continue to rise sharply. My outlook now incorporates details of the

spending bill, and with this additional boost in aggregate demand, I see stronger real GDP growth and an even lower unemployment rate over the next two years.

Payroll growth has remained strong, as the goods-producing sector has been adding over 60,000 jobs per month over the past six months. This is a welcome strengthening of this sector, but it's unclear how long the recent strength can persist. Research by my staff suggests there are still significant structural factors holding back the participation rate for prime-age males. I expect a larger story can be found in the numbers for private service-providing industries, which account for 84 percent of total private employment. Here, payroll gains have been moderating over the past few years in line with my modal forecast, which is consistent with a tightening labor market. Explaining why wage pressures haven't surfaced as the labor market tightens as it has in past expansions, of course, is less clear. I thought the Tealbook box on market concentration and monopsony power provided an interesting perspective.

Analysis by my own staff shows that by one simple measure, employment by firm size, concentration has indeed been rising. The employment share of firms that have 500-plus employees has risen from 43 percent in 1993 to 51 percent in 2016. In contrast, the employment share of firms with less than 50 employees has fallen from 35 percent to 28 percent over the same time horizon. Growing monopsony power is likely to be a larger headwind for wage growth in low- and middle-skilled jobs for which workers have less bargaining power than high-skilled workers. Other perspectives on wage dynamics come from anecdotes by our District contacts. They report firms are finding ways to avoid broad-based wage increases by using more flexible work schedules and arrangements and exploring new labor-saving technologies in an effort to increase the degree of automation of tasks for which labor shortages currently exist.

With regard to inflation, the weakness seen last spring is starting to give way to rates of price growth more in line with the economy's fundamentals. My own forecast of inflation is for it to move modestly above 2 percent in 2019 and 2020. Among factors boosting my outlook for inflation are medical prices. Because of the considerable weight on medical prices in the core PCE index, I found the Tealbook discussion helpful, as it explored recent developments and future prospects. My own staff estimates that a tighter labor market in the health-care sector should boost this sector's nominal wage growth toward 3½ percent by the end of this year, a notable acceleration above its current 2.8 percent. As a result, price increases for health-care services should rise toward 2½ percent in 2018, as my staff estimates a significant amount of pass-through of nominal wage growth to health-care price increases. In terms of risks to my forecast, risks to the inflation outlook appear to be more balanced than we've seen for several years. The main downside risk I see stems from trade policy.

While the direct economic cost of raising tariffs on steel and aluminum appears to be small, indirect costs may be larger. Further disruptions to international trade markets may rise if additional tariffs are imposed on China and as countries facing new tariffs potentially impose tariffs of their own. Contacts in my District have expressed strong concern, as agricultural goods could likely be a target for retaliatory tariffs on U.S. exports. Thank you.

CHAIRMAN POWELL. Thank you. President Bostic.

MR. BOSTIC. Thank you, Mr. Chairman. Voices in the Sixth District continue to be relatively optimistic, and most of my contacts said that business activity was largely unchanged. After a strong second half last year, most contacts were unconcerned about the recent weakness in the economic data. The one exception to that view was on the trajectory of the consumer, which was arguably the weakest area in the data. Contacts who have insight into the retail and

food service space were surprised by the apparent lack of response among consumers to realized tax changes. For now, though, the recent downswing in the data gives me limited concern, especially given the potential for residential seasonality, a slowdown in autos following a post-hurricane surge, and a lack of concern on the part of my network contacts. In my view, the near-term growth picture—that is, growth for the first five months or so—is largely unchanged. That said, I am marking up my real GDP growth projection for this year and next, but that is almost entirely due to the additional fiscal stimulus arising from the Bipartisan Budget Act of 2018.

On the topic of tax reform, I have not changed my assessment of the Tax Cuts and Jobs Act. I still see it having a modest to moderate effect on real GDP growth in 2018 and 2019. This assessment is partly informed by the results of our national survey of businesses. Back in December, I cited some of the survey work that my staff, alongside academic partners, had done. At that time, 63 percent of firms were not changing their cap-ex plans in response to tax reform in 2018. These firms were surveyed again last month, and that share had increased to 75 percent. We also asked about planned expenditures for 2019. The results were the same: Nearly 75 percent of the survey respondents indicated that the tax cuts were not materially changing their cap-ex plans. Just in case, my REIN team probed more deeply on this question in face-to-face meetings with contacts to see if there were any nuances not covered by our survey question. The answer I got back was exactly the same as in the survey results: The majority of our contacts are not materially altering their investment expenditures on the basis of the tax cut legislation.

There is one interesting aspect to our findings that could yield some upside risk to my projections. There was a meaningfully different response to the capital expenditure plans by the size of the firm. It appears that larger C corp firms have much more clarity when it comes to

whether the recently enacted Tax Cuts and Jobs Act will lessen their tax burden, and, thus, were more certain about how they were deploying any tax savings. The upshot is that smaller pass-through entities may revise up their capital expenditure plans when they gain clarity about all of the implications for them of the tax-reform package.

While real GDP growth in my SEP submission has been revised up, I am still not taking on board the more significant boost that we see in the Tealbook projections. That said, the risks to my growth outlook are weighted to the upside, as the recently enacted fiscal measures could have a much more transformative effect on output growth than I currently expect.

But, here, too, the story has been muted. What was borderline exuberant, bright-sky sentiment on the part of the Sixth District contacts and directors has been muddied by the uncertainty regarding the ramifications of changes in U.S. trade policy. Some directors thought this new cloud of uncertainty touched on more than just trade and was a reflection of something more pervasive and systemic. To quote one director, “This is a disruptive and disorienting time.” It is unclear if what I was hearing was just a reflection of the freshness of the news. We all know that businesses hate uncertainty in all of its forms. It is entirely possible that this surge in pessimism will abate quickly. Still, in my boardroom last week, I did hear reports of some contacts shelving expansionary projects until the smoke clears and a few more suggesting that the latest bad news will offset most, if not all, of the promise that tax reform held. My “takeaway” is that the upside risks have moderated since our January meeting. The picture that my contacts and directors paint of the labor market has not changed materially since our previous meeting. In their words, conditions are still tight, they are still struggling to find qualified workers, and they are increasing compensation where, and only when, they need to.

I did find the results of the recently completed national Small Business Credit Survey interesting. Perhaps not surprisingly, most firms are having difficulty filling positions. However, a firm's response to hiring difficulty depends on the nature of that difficulty. When the problem was too few applicants or competition from other employers, firms were significantly more likely to be raising compensation in response. This, to me, sounds exactly like the simple supply-and-demand effects we expect to come from firms facing cyclical competitive pressure in a tight labor market. However, when the problem was applicants lacking skills, the systematic response was not compensation. Rather, it was to change the jobs requirements, to increase training, and to reallocate existing job duties. In view of the fact that applicants lacking skills was the number-one complaint of firms, this difference in response might help explain the fact that nominal wage growth has not increased, even as other indicators of labor market conditions have continued to tighten over the past year or so.

It might also help account for our anecdotal feedback. From the firm's perspective, labor costs have increased. Raising compensation, training, reorganizing, and loosening standards are all costs, some explicit and others in terms of lost productivity. Now, on the point of the skills shortfall, I actually agree with President Kaplan. Skills training and workforce development efforts in the United States don't have the capacity or the capability to reposition the large number of workers that we will need to remain competitive. And this is an issue of considerable concern that I hope gets addressed by policymakers.

As for signs of retail price pressure, most businesses are reporting muted pressures, at best. One of the few contacts that did indicate an ability to pass on price increases was a regional soft drink bottling company. [Laughter] Wait for it. It's coming. He indicated that he was using news reports on tariff-related increases in aluminum prices as justification to raise prices.

He dubbed it the “Robin Roberts effect.” In essence, it seems that when inflation news moves from the financial press to *Good Morning America*, you get much less “pushback.” In any event, I do see inflation continuing in the vicinity of 2 percent throughout the forecast horizon. With the near-complete closing of resource slack, the dissipation of last year’s negative transitory influences, and the prospects of potential import price effects of trade policies, I do have the risks to my inflation outlook tilted modestly to the upside. However, I am not too concerned about falling behind the curve. But I will have more to say about that tomorrow. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President Williams.

MR. WILLIAMS. Thank you, Mr. Chairman. All signs point to an economy operating above full employment. Job vacancies and quit rates are high. Surveys of workers and employers show a taut labor market. Employment rates, both in aggregate and in the case of various demographic groups, have reached lows that would have been dismissed as unattainable just a few years ago. Even nominal wage growth, a lagging indicator of slack, has been edging higher..

Regarding wage growth, Alan Krueger, the former chair of the Council of Economic Advisors, recently spoke at the San Francisco Fed to discuss this missing wage growth. He noted that nominal wage growth has been running well below what it historically would have been, taking into account the tightness of the labor market. And, similar to the comments of President George, he attributed this shortfall to various structural factors, including less-competitive labor and product markets that have lowered workers’ bargaining power. Of course, such structural factors cannot be offset with monetary policy on a sustained basis.

Now, while I judge the economy to be already beyond full employment, there is considerable momentum to push us even further past this benchmark. Real GDP grew much more rapidly than potential GDP last year, and I expect a repeat of this pattern this year. Now, admittedly, so far this year the monthly spending indicators have sputtered a bit. But, in common with the comments of Governor Brainard and President Bostic—and to no surprise to those of you who have heard me talk about this every single year—I take very little signal from the slow start, because of the residual seasonality that typically depresses first-quarter growth. Now, my staff has reexamined this data, and it estimates that, after accounting for residual seasonality, first-quarter real GDP growth would be almost 2½ percent. So, properly measured, current-quarter real GDP hasn't really decelerated from last year's pace.

The Bureau of Economic Analysis is planning, in its comprehensive NIPA revision this August, to improve its methods and essentially eliminate this residual seasonality. Now, the best news for this group is that this should be the last meeting I talk about residual seasonality ever, although I, of course, will remain unwaveringly data dependent on this issue, as on all issues. So, looking forward, I expect continued robust growth, with real GDP growth of 2.7 percent this year and 2.3 percent next year. Again, that is considerably in excess of the pace of potential—which I still peg at about 1.7 percent.

Now, President Barkin made remarks about optimism about productivity growth, and I feel the same. Right now, it's in the off-season. And as a lifetime 49ers fan, I am really excited. We just signed a backup quarterback from the Patriots and a backup running back from the Vikings, and I am feeling very good about this season. But I do have to look back at the data last year. Productivity growth has been very slow through the fourth quarter of last year. We have

yet to see this improvement. So, again, I share the hope and optimism about that, but, like with the 49ers, I actually want to see some data that shows that we have turned the corner.

With growth well above potential, I see the unemployment rate drifting down to 3½ percent this year and remaining there for another year or two. Overall, I view the risks to this outlook as balanced and not unusually large relative to the past 20 years, despite an increased risk of a worsening of international trade relationships that many have already discussed.

My real GDP growth projection is significantly higher than I had in December. Back then, I expected the fiscal stimulus associated with the proposed tax package to boost the level of aggregate demand almost ¾ percentage point by the end of 2020. Now, due to the additional impetus from the budget plan as well as a larger effect of the earlier tax changes, I expect the fiscal boost to be about twice as large—1.4 percentage points. My assessment of the overall fiscal stimulus is still slightly smaller than what is in the Tealbook, and as a number of you have mentioned, such fiscal stimulus is unprecedented at this late stage in the business cycle, so history is an uncertain guide. But in view of the current strength of the economy, the effects of the lower taxes and greater spending likely will fall somewhat short of past experience.

Regarding inflation, the latest data show that prices have been rising as expected. I continue to project that core inflation will gradually move toward the 2 percent target by the middle of next year and then to overshoot it a little bit. I should mention, I was very interested to see in the SEP results that about half of the group here has core inflation overshooting the 2 percent target in 2019, as I do, and nearly everyone has some overshoot of inflation in 2020. I view the risks to this forecast as balanced. Inflation could again underperform, as it did last year, but on the upside, there is a risk that very tight labor markets may foster a more rapid increase in inflation. So far, my directors and business contacts do not see any sign of any dramatic pricing

pressures. They generally report that costs are going up, but downstream price increases are still restrained. Finally, with regard to appropriate monetary policy, my projection is four funds rate increases this year and another four next year. This comprises a modest steepening of the path that I penciled in back in December. Now, this does result in a 1 percentage point overshoot of my estimate of the longer-run nominal funds rate, which I still view to be 2½ percent, as the equilibrium real funds rate stays at ½ percent.

Now, I should talk a little bit about the phantom menace that President Bullard commented on. And I did note that a number of people appeared to have raised their views of r^* in the economic projections this round. I will just note that most estimates, whether based on economic data or using real bond yields, remain very depressed, and they showed very little increase over the past year. And that was shown in the Tealbook chart but is also consistent with the estimates using Thomas Laubach's and my model and other estimates that we have done at the San Francisco Fed. Now, all else being equal, the fiscal stimulus could boost r^* by about ¼ percentage point or so. But this boost will likely be partially, or maybe even fully, offset as the higher federal debt raises either the term premium on bonds or leads to budget tightening down the road, as imagined in the Tealbook. So, again, I have not changed my estimate of r^* this time, and the real rate remains at ½ percent. I am SEP respondent number 5. Thank you.

CHAIRMAN POWELL. Thank you. President Kashkari.

MR. KASHKARI. Thank you, Mr. Chairman. Moderate growth continues in the Ninth District, with continued anecdotal evidence of tight labor availability and some more evidence of rising wages. A major retailer based in the District raised its minimum pay to \$12 an hour, but there are modest wage increases in the public sector. There are some signs of

increasing price pressures. District firms report rising input prices, and many are noting rising construction costs.

For the national economy, my outlook is similar to many of yours. The outlook is generally pretty positive, taking into account the various tailwinds such as tax reform and the spending bill, strong asset values, and high consumer and business confidence, strong foreign growth, and recent dollar depreciation.

Now, for the labor markets, which is where I spend most of my time trying to assess, continued strong payroll numbers have surprised me, averaging 240,000 per month over the past three months. At the same time, the unemployment rate has been flat at 4.1 percent since October. So where are all the new workers coming from? The healthy labor market is causing some people to delay exits and drawing people into employment from out of the labor force. Some people who in the last month said they were retired and not looking—this month they have a job, which I find remarkable. Others said last month that they were sick or disabled, not looking—this month they have a job, which, again, I find remarkable.

And are firms boosting wages to attract these workers? No. There's not much evidence of rising wage pressures. The average hourly earnings continue to rise only about 2.6 percent per year. Adjusted for inflation and productivity growth, real wage growth looks pretty flat and does not look like it's a leading indicator of inflation to come. I read these facts as telling us that there was a lot more slack in the labor market than I thought—and as jobs have become easier to find, a lot of people have decided to move back into the labor market. Until we see monthly job numbers slow or wage growth pick up, I will remain skeptical that we have exhausted the pool of potential workers and reached full employment.

Now, inflation has moved up slightly in recent months, which is welcome. Recent monthly core numbers have been closer to 2 percent. Still, on a 12-month basis, where I focus, core PCE is at 1.5 percent, and we should not declare victory prematurely. I acknowledge that, in March, when that March number rolls off, there will be a pop, but we will still likely be below our target. Market-based measures of inflation expectations have edged up, which is welcome, and downside inflation risk seems to have subsided some since last summer. It seems like some of this boost will be transitory. Rising oil prices since last summer are pushing up energy price inflation. The broad dollar has been depreciating since a peak at the start of 2017. Import price inflation has been running at about 3½ percent. I'd be more confident that inflation will move up to 2 percent on a sustained basis if we saw wages rising more quickly.

In financial markets, there's a notable increase in longer-term nominal rates since the start of the year. It's difficult to accurately diagnose the driving force. Perhaps it's partly a more optimistic growth outlook reflecting more fiscal stimulus. Like President Williams, it's too soon for me to conclude that the neutral real interest rate is rising, but I will pay close attention. I also continue to monitor the yield curve. The 10-year, 2-year yield spread widened over the start of the intermeeting period but has since narrowed again, giving back much of its gains. That signals that markets are expecting a fairly aggressive path of rate increases. If the spread narrows further, I will become more concerned about the path of monetary policy and potential recession risk.

So, in summary, there is some progress on getting inflation back to target. I would say we're not there yet, and nominal wage growth and inflation expectations remain low by historical standards. I don't see any reason to think that ongoing employment gains are unsustainable. The unemployment rate is not falling. Real wages are not accelerating. The

upward trend in prime-age labor force participation shows no signs of slowing. In fact, if we start to see healthier wage growth, I would expect prime-age LFP to rise even more quickly. It seems clear that a large fraction of labor market slack during the Great Recession showed up as depressed LFP. Since the fall of 2015, a healthier labor market has led to a steady recovery of LFP. This has been a great thing for the U.S. economy, both from an aggregate growth standpoint and also because we all know that there are so many societal benefits in having a larger share of prime-age Americans at work.

And I'll just offer one final anecdote. In all of my travels around my District, I have never met a worker who said, "Boy, I regret reentering the labor market, and I want to go back to playing video games." [Laughter]

CHAIRMAN POWELL. Thanks. Thanks, everyone, for an enlightening set of comments. And before that, for—my apologies. [Laughter]

VICE CHAIRMAN DUDLEY. Already out the door. And I can test Neel's hypothesis about whether I want to get back into the labor force [laughter] or not.

Thank you, Mr. Chair. In my view, the economic expansion very much remains on track despite the apparent slowdown in consumer spending. Some of this slowdown in household outlays may represent the payback for spending induced by the recovery from Hurricanes Harvey and Irma, something that President Bostic has talked about, and a slower pace of tax refunds. I'm putting a lot more weight on the robustness of payroll employment growth over the past few months. I take much greater signal from that than from the weakness in household spending. Furthermore, I think it's really hard to put much weight on the notion of a sustained slowdown when all of the other aspects of the environment are really very conducive to growth in real GDP: Still-buoyant financial market conditions, a sharp shift in fiscal policy toward

stimulus made even greater by the large increases in the budgetary caps on discretionary domestic and on defense spending, and the fact that we have a synchronized global expansion.

On the inflation side, the news seems broadly consistent with a gradual upward trend toward our 2 percent objective. Although I agree with others that nominal wage growth has not picked up very much at all, there are—I think, increasingly—anecdotal reports of higher wages being paid and scattered worker shortages. In addition, I think the recent rise in the labor participation rate is consistent with a still-tightening labor market.

With respect to the outlook, I think there are three recent developments that many of you have cited that I think are worthy of attention. The first is the sharp shift in fiscal policy toward stimulus, with the budgetary caps increase being the most recent installment. The cumulative increase in spending combined with the tax cuts are a very significant fiscal policy impulse, and it's going to be particularly large in 2019 because the budget authority precedes the actual spending. So that suggests to me that it's highly likely that growth is going to continue above trend not just in 2018, but also in 2019. Combined with still very easy financial conditions, it suggests to me that the risk to the growth outlook may have started to tilt to the upside. And that makes me much more concerned about the risk of economic overheating a few years down the road.

I'm also more worried that the fiscal trajectory, at some point, is going to lead to a sharp reevaluation of the longer-term economic outlook, and that could result in a major reappraisal of the prospects for the U.S. equity markets. So what I'm really saying is that I think there's a risk of a much bumpier ride a couple of years down the road. More fiscal stimulus will also put pressure on us to hike short-term interest rates more than currently anticipated, and higher

interest rates, in turn, will push up debt service costs—exacerbating what is already an unsustainable fiscal path. Surely that feedback loop can't be a comfortable dynamic.

The second development, which many people talked about already, is the Administration's decision to impose tariffs on steel and aluminum imports. While I agree with others that the consequences—in terms of employment and inflation of this measured by itself—are quite trivial, if that's all there is, there are reasons to be concerned that this won't. If other countries respond in kind, what will the United States do in response? Also, what happens if higher trade barriers actually prove to be politically popular, even as they are likely to be destructive from an economic perspective? If that's the case, why stop at aluminum and steel? As I see it, the higher trade barriers will tend to introduce new frictions into the economy by necessitating adjustments in global supply chains. Also, by encouraging greater production of goods and services where we are less productive at the expense of exports where we are more productive, higher trade barriers tend to have negative consequences for productivity and potential real GDP growth. So both factors imply some upward impetus to inflation coming from greater trade barriers.

The third development is the recovery of the equity market after its short-lived correction. Going into the correction, I was very uncertain about how much damage would be caused by a sharp rise in volatility. If investors had high-risk appetites just because volatility was low, what would happen if volatility spiked? And this seemed to be a significant source of vulnerability for the equity market. Although I agree with Lorie that the jury is still out, the outcome has, to me, been mostly reassuring. Volatility spiked and imposed quite a bit of stress on those who were pursuing low-volatility strategies. Some of those positions, especially those in the short-volatility exchange-traded products, have now been washed out, as these products have just

disappeared, without any great consequence. To me, this suggests that the low-volatility environment probably was not the major factor supporting equity market valuations. Instead, I would put more weight now on the fact that the equity market is being supported mainly by expectations of sustained economic expansion, higher corporate profit growth generated in part by the corporate tax cuts, and interest rates that are still quite low.

That said, I do think the prospects for the equity market are going to become much more challenging within a year or two. First, there's the prospect for more negative developments on the trade front. Second, earnings growth in 2019 is likely to slow sharply or even contract as some of the gains associated with the corporate tax cuts are competed away. I don't think the equity market participants are focusing on this at all at this point. And, third, interest rates are likely to move considerably higher over time, with the U.S. Treasury's enormous financing needs likely to weigh on the bond market, and that's likely to create much more competition with the equity market. So my bottom line is this: Enjoy the present, because within a year or two, the economic and financial environment is likely to become much trickier for us—or should I say, you—to navigate. [Laughter] It also underscores the necessity of continuing to remove monetary policy accommodation this year. I think it's important to get monetary policy back to a broadly neutral monetary policy setting—and that implies that four 25 basis point hikes are likely to be appropriate this year.

In terms of New York's SEP submissions, I think we're sort of in line with everybody else, but we've raised our real GDP growth estimates for 2018 and 2019 0.3 percentage point and 0.5 percentage point, respectively. So we're at 2.8 for 2018 and 2½ for 2019 on growth. We pushed down our unemployment rate forecast to 3.5 percent in 2019, and it would have gone quite a bit lower except that we are assuming that the labor force participation rate continues to

drift up. Our inflation forecasts are little changed, with overall and core PCE inflation now moving slightly above 2 percent in 2019 and 2020. For the federal funds rate path, not only have we moved to four rate hikes this year, we've also added an additional rate hike in both 2019 and 2020. So in 2020, our SEP submission now has a federal funds rate of 3.63 percent, which is a bit above our longer-run estimate of 3 percent. So we see monetary policy having to move to a somewhat tight setting. Thank you. And thanks for remembering me. [Laughter]

CHAIRMAN POWELL. Thanks to everyone, including Vice Chairman Dudley, in this case [laughter], for an enlightening set of comments and also, I thought, a very interesting, thoughtful discussion before the round. I see a fair amount of common ground around the table on the broad outlines of the outlook, and my own views are very much in line with that consensus. I will discuss some of the major themes I heard and also weave in my own views.

To put it in a nutshell, I join in what seems to be a widespread consensus that the outlook for growth and employment is at least a bit stronger than it was at the time of the January meeting and meaningfully stronger than at the time of the December SEP submissions. All else being equal, the real side strengthening, along with a small amount of corroborating data on inflation, warrants greater confidence that inflation will move up to our 2 percent objective.

Let me flesh that out a bit. The strong job market seems to have become stronger still. Monthly job gains averaged 240,000 over the past three months, which is a faster pace than we experienced last year and more than twice the pace required to keep the unemployment rate stable, holding the participation rate constant.

Several other indicators support what seems to be broad agreement that the economy is very likely in the vicinity of maximum sustainable employment, and that momentum in the job market and the economy more broadly will further tighten labor market conditions. The fiscal

stimulus due to the Bipartisan Budget Act is a second major factor supporting an upward revision of the outlook. According to staff estimates, the BBA will add about ½ percent in total GDP over the next three years. Combined with the effects of the Tax Cuts and Jobs Act enacted earlier, the staff sees a net cumulative effect of 1¾ percent of GDP, spread fairly evenly over the next three years. So although the fiscal policy and labor market news are probably the most notable updates since January, other factors continue to support economic activity as well, including tailwinds coming from abroad, whose data point to a generally upbeat start to the year. In addition, financial conditions remain accommodative despite a modest net tightening since the Committee’s January meeting.

The inflation side of the mandate continues to be more challenging. Most everyone seems to agree that the stronger outlook should provide some upward pressure on inflation and, thus, increase our confidence that inflation will move up sustainably in the medium term to around 2 percent. And, on a positive note, measured inflation has rebounded, as predicted, from the lows of the past summer. To pick one particularly favorable number: Core PCE inflation has run at 2 percent over the past 6 months. Ample experience over the past few years makes clear, however, that we should not make too much of a brief run of favorable inflation data. Thus, much of the discussion around the table focused on how much confidence we should have that inflation will rise and settle into modest fluctuations around 2 percent.

The “deep dive” that we did on inflation at the January meeting very much informs our discussions of today. And a quick summary of what that discussion implies for today could be that the more robust real-side outlook, all else being equal, should imply a somewhat stronger upward impetus to inflation. There is, however, considerable uncertainty about just how strong that impetus is at the present. For example, the recent acceleration in job growth has been met

by rising labor force participation, leaving the unemployment rate unchanged. Although labor force participation is running above the staff's estimate of its trend, that estimate is subject to considerable uncertainty, leaving open the possibility that these higher readings could persist. This would, of course, be a welcome development, particularly for prime-age males, whose participation rates have not fully recovered since the Great Recession.

Several of you raised the relative absence of wage pressures as a compelling reason to question just how tight the labor market is at present. Nominal wage growth has been moderate, with average hourly earnings and the employment cost index showing only gradual acceleration relative to recent years. In view of the state of our knowledge about various unobservables, such as the natural rate of unemployment and the neutral rate of interest, we need to consider the two-sided risks expressed around the table. Specifically, lags in the transmission from monetary accommodation to rising inflation may mean that the FOMC is already laying the groundwork for difficult-to-manage inflation pressures or other excesses. But it is also a real possibility that even tighter labor market conditions over a sustained period might be required to lift inflation into a pattern of modest fluctuations around 2 percent.

Because of our imperfect understanding of the mechanisms driving inflation and inflation expectations, we have little choice but to make policy as best we can in light of the costs and risks on either side. In my view, the policy of gradual rate increases that we have been pursuing balances those risks in roughly an appropriate manner. In this view, the improved real-side outlook reflected in the Summary of Economic Projections should provide some additional upward impetus to inflation. Maintaining the appropriate balance, in my view, therefore, calls for a rate increase at this meeting and also perhaps a modestly steeper path of the federal funds rate in the modal outlook. As we regularly remind our audiences, our forecasts are far from

certain and are not promises. And two issues that were raised around the table may affect the outlook and seem particularly worthy of note.

First, the spending data suggests that the economy might have hit a bit of a pothole in the first quarter. Now, mid-winter potholes seem to have become a fairly regular occurrence in the economy, and indeed in our local commutes. [Laughter] Consumption, in particular, appears to have slowed significantly from a very strong 4¼ percent annualized growth in the fourth quarter to an estimated 1½ percent in the current quarter. Like the staff and many others around the table, I am taking this slowing with a grain of salt in light of the robust job market, fiscal stimulus, and other factors discussed today. Fortunately, we should know in the next couple of months whether this pothole is filled with the coming of spring, and if not, then a more gradual path of rate increases may be appropriate.

Second are the risks concerning trade that many of you mentioned. Unlike most of you, at present, I do not see a need to incorporate a significant trade disruption in the forecast. But changes in trade policy now present a new downside risk to the outlook. I am going to stop there, and we still have plenty of time for Thomas's monetary policy briefing. So I will turn the floor over to Thomas. Thank you.

MR. LAUBACH.⁵ Thank you, Mr. Chairman. I'll be referring to the handout labeled "Material for the Briefing on Monetary Policy Alternatives."

As David noted, the two employment reports received since your January meeting show the labor market continuing to strengthen. With fiscal stimulus in the pipeline, an upgrade to the foreign outlook, and financial conditions still accommodative, it is likely to strengthen further. The inflation data already in hand suggest that, when you next meet, the latest readings on 12-month headline and core PCE inflation will be close to 2 percent. It is less clear whether inflation will run near 2 percent on a sustained basis or will again go below your objective.

A key question that you are confronting is how strongly to lean against further labor market tightening when the future course of inflation is still quite uncertain.

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

The upper-left panel in the exhibit uses a simple graphical device to track the economy's position relative to your objectives over the years since 2007. The deviation of 12-month core PCE inflation from 2 percent is given on the vertical axis, while the horizontal axis plots the distance of the unemployment rate from the staff's current estimate of the natural rate of unemployment prevailing at that time. Each black circle represents the situation at the end of one calendar year. As the financial crisis unfolded a decade ago, the economy moved rapidly from the northwest to the southeast quadrant, where it stayed for many years. The persistence of low inflation as the labor market strengthened in recent years shows up as a leftward movement from the southeast to the southwest quadrant. The red dots present the medians of your SEP submissions for the unemployment gap and core inflation for the current and next two years.

As discussed in the bullets to the right, the northwest and southeast quadrants, shown in blue, depict situations in which there is no policy tradeoff. When the economy is in the northwest quadrant, monetary policy should be restrictive so as to reduce inflation and return the unemployment rate to its natural rate, while in the southeast quadrant, monetary policy should be accommodative. The green-shaded quadrants could potentially pose policy tradeoffs—I say “potentially,” because the southwest quadrant is raising the question you have confronted for some time: How concerned should you be about unemployment below the natural rate estimate when inflation appears subdued?

The middle-left panel—with apologies to President Evans, who may be reminded of March Madness—shows indifference curves representing two loss functions similar to those we routinely use for the optimal control simulations in the Tealbook. The sum of the squared inflation gap and squared unemployment gap is the same for every point on a solid circle. As discussed to the right, the circles represent a loss function that places equal weights on unemployment gaps and inflation gaps and treats positive and negative gaps symmetrically. Outcomes on circles closer to the center are preferred to those on wider circles. The dashed lines show outcomes that are equivalent from the perspective of an “asymmetric” loss function akin to that shown in the Monetary Policy Strategies section of Tealbook A: For any given level of inflation, there is no loss associated with having the unemployment rate below the natural rate. In other words, as long as the unemployment rate is lower than the natural rate, only deviations from the inflation objective matter. Starting from the economy's current position, if you valued outcomes according to the symmetric loss function, you would aim to bring the unemployment rate back to its natural rate even at the cost of continued undershooting of inflation, as in the solid blue arrow. By contrast, the asymmetric loss function would call for returning inflation to 2 percent even if doing so would push the unemployment rate further below the natural rate, as in the dashed arrow.

How can this diagram provide a perspective on the options presented to you in the policy alternatives? Because you are evaluating not only today's economic performance, but also outcomes for years to come, you are taking into account how your policy decisions today affect the probability that the economy will, in the future,

be in one or another of the quadrants of this diagram. In other words, the alternatives, while mostly agreeing on the economy's modal outlook, convey different assessments about which policy strategy maximizes the chances of remaining close to your objectives. For example, even if you regarded unemployment below the natural rate as potentially beneficial, a view that might be represented by the asymmetric loss function, you may, nonetheless, be concerned about potential adverse future consequences of this undershoot.

The lower-left panel illustrates, in the form of arrows in the diagram, a few risks that you have cited at past meetings or in your SEP narratives. The blue path illustrates a scenario in which the unemployment rate declines further while nonlinearities in the Phillips curve appear, leading to a substantial increase in inflation and necessitating a marked policy tightening that triggers a recession. Although the Phillips curve appears to have flattened substantially in recent decades, during that period, the economy has not operated for a sustained period with a labor market as tight as you project to prevail in coming years. Alternatively, the green path might arise from a sustained reversal in financial conditions and in attitudes to risk-taking. Some of you have articulated the concern that a period of high resource utilization, combined with still-low interest rates, could lead to unrealistic expectations of a continuation of this situation and to unwise borrowing commitments by firms and households. If, at some point, expectations of high growth and low interest rates were disappointed, the economy might enter into recession without first triggering a bout of inflation. We don't have clear evidence supporting a causal link between tight resource utilization and excessive risk-taking, but this remains an active area of research, and the jury is still out. As discussed to the right, either of these two scenarios or both could motivate the emphasis placed by alternative C on slowing the growth of economic activity and employment to sustainable rates. To achieve this, the federal funds rate will likely have to rise materially above its longer-run level, as hinted at in the fourth paragraph.

The red arrow depicts a scenario in which the expansion ends not because high levels of resource utilization cause either an inflation outbreak or financial instabilities, but because of some other exogenous shock that occurs before inflation returns to 2 percent on a sustained basis. Following years of inflation running below 2 percent, inflation expectations may decline more than they did during the recent recession, reducing the already limited space for providing monetary policy accommodation and increasing the negative consequences of policy being constrained by the effective lower bound. Alternative A focuses on mitigating this risk by leaving the target range for the federal funds rate unchanged while indicating the Committee's willingness to provide the accommodation necessary to ensure that inflation expectations are consistent with its inflation objective.

Alternative B balances these various risks by acknowledging the strength in the outlook for the labor market and the prospects for inflation moving soon toward 2 percent while maintaining the policy guidance of further gradual rate increases. Alternative B continues the Committee's recent approach to raising the federal funds rate, consistent with an assessment that this approach has supported the resilience of

the economy to a number of headwinds in the past, and that the effects of the gradual removal of policy accommodation over the past two years, including the ongoing process of balance sheet runoff, will slow the economy's momentum over time. Although the upgrade in the economic outlook since December may warrant a somewhat steeper path of the federal funds rate, the broad continuity with your recent statements is intended to signal that your reaction function has not changed.

Thank you, Mr. Chairman. That completes my prepared remarks. The January statement and the draft alternatives are shown on pages 2 to 9 of the handout. And I will be happy to take any questions.

CHAIRMAN POWELL. Questions for Thomas? Bill.

VICE CHAIRMAN DUDLEY. I had a question on the exhibit with the circles in the middle of the page. I get why the dotted arrow goes this way. Why does the solid arrow go down? In other words, the unemployment rate is below the natural rate—why is inflation falling as opposed to rising? Is that because people are looking ahead?

MR. LAUBACH. What it's intended to show is that that is something that would, from the perspective of the symmetric loss function, be welfare improving.

VICE CHAIRMAN DUDLEY. I understand why you're going in that direction. But why is it downward sloping? You have the inflation rate falling, even though the unemployment gap is still negative. I'm trying to understand why you wouldn't have the dotted arrow going in this direction and the solid arrow in that direction.

MR. LAUBACH. You're absolutely right that it's not necessary that that's what would happen. So this is not necessarily movement strictly along a Phillips curve, for example.

MR. EVANS. Okay, but that's what you had in mind with that arrow—right?—that if you were to raise rates in order to get the unemployment rate to move back toward the natural rate, the Phillips curve would be reducing inflation, right? That's what you had in mind.

MR. LAUBACH. I think it's pushing a little bit the limits of this diagram. Obviously, this diagram is a little bit simplistic in the sense that it omits more complicated dynamics.

MR. EVANS. Right, right. No, I'm a big fan of this diagram.

VICE CHAIRMAN DUDLEY. I like it. I mean, I think it's a great way of bringing out the key issues—I do like this.

CHAIRMAN POWELL. There's a question.

MR. EVANS. I mean, I took the direction of the arrow to be the Phillips curve. You're right—other things can happen in Vice Chair Dudley's question. Another one would be, you have the unemployment rate sitting—if you could make it sit, which is a big question by itself—under 4 percent, and if you were to do that for a few years, what might you think inflation expectations would do? Then they might push you toward the origin. That would be the nature of how you do that. So, anyway, I thought it was very interesting. I appreciate it.

CHAIRMAN POWELL. Other questions for Thomas? President Williams.

MR. WILLIAMS. You know, I think that if we're going to have a serious discussion about the asymmetric loss function, I want to reiterate what President Mester said and what, I think, President Rosengren was pointing to. In a standard model, an asymmetric loss function will not deliver you the mean of inflation and unemployment that we actually think is equilibrium. You have to think carefully about how you design an asymmetric loss in terms of a model—in thinking about, in a stochastic environment in which the economy can have a boom and a recession and things. So I have always viewed this as an illustration of how to kind of think in the moment about how we deal with tradeoffs. But if you're really thinking about it as a strategy, and thinking about our January consensus statement on strategy, I think we really have to have some very good analysis by the staff that goes through how this actually works in general—not just in the current situation, We also need to think about the interaction with the

zero lower bound and reasons why—if the economy has asymmetries in it or nonlinearities, how those then feed into this.

So I think this is good for just illustrating some situations, but it isn't really a good way to think about, necessarily, a monetary policy strategy in our longer-run goals and strategy statement, because it doesn't actually work in general.

VICE CHAIRMAN DUDLEY. Other than that, there's no problem. [Laughter]

MR. WILLIAMS. But I think if we're really going to think about this in terms of a strategy and something we're going to revisit, we should have a lot more analysis about how we would implement this in general, not just in a particular situation.

CHAIRMAN POWELL. President Evans.

MR. EVANS. I think these are great comments, and I think that we should be looking at exactly those issues. I certainly agree. I thought that perhaps with the existence of the zero lower bound increasing the inefficiencies of monetary policy, an asymmetric loss function might be a partial offset, or it might overcompensate as an offset. But without something like that, the effective lower bound might lead you to think that we couldn't get, on average, to 2 percent inflation unless we had some other overriding, stronger accommodation the other way. So I think it comes down to the analysis, and I think that's great.

Now, I made this comment earlier. I should have been a little more careful when I said that sometimes I feel handicapped by my economic training, because I'm quite prone to thinking through what you're talking about. I thought that one of the benefits of having a broader group of people here was to point out that there are other reasons why we might do a lot better, and there's this uncertainty, and I just don't know how it will play out. So it's worthwhile to think this through—I'm all in favor of that. Thank you, Mr. Chair.

CHAIRMAN POWELL. President Bullard.

MR. BULLARD. Thank you, Mr. Chairman. Just to pile on a little bit: I do also like this diagram, and I like this way of thinking about things. If you're going to have a model that has a natural rate of unemployment, then the origin is going to be the place you want to be. So I don't think you can just pile on top of that an asymmetric loss function. I guess that's what you're saying, President Williams. You could have a model in which anything is an equilibrium as long as it's below some level. Anything between 0 and 4 or something like that is an equilibrium unemployment rate, and then you just want to go back to somewhere along the horizontal dotted line.

So you could think about things that would work, but they're pretty unconventional compared with what we're used to doing here around the table. And I agree totally that this seems intuitively appealing, but there are some deep issues behind this picture. I guess that's the message. Thank you, Mr. Chair.

CHAIRMAN POWELL. Okay. Thank you very much. A couple of small points before we wrap up. First, you will have noticed a little bit of blue ink in alt-B, and that is really nothing more than a tiny grammatical change, which achieves a slightly higher degree of agreement between the subject and the verb of the sentence. [Laughter]

VICE CHAIRMAN DUDLEY. All is good.

MR. EVANS. "Slightly."

CHAIRMAN POWELL. That said, thanks, everybody, for an interesting day. We now have a reception and a dinner beginning at five o'clock downstairs in the elegant West Court Café. And all participants, including Vice Chairman Dudley, are invited to join us. [Laughter]

VICE CHAIRMAN DUDLEY. Thank you. I appreciate that. [Laughter]

CHAIRMAN POWELL. See you tomorrow morning at nine o'clock. Thank you.

[Meeting recessed]

March 21 Session

CHAIRMAN POWELL. Good morning, everyone. Welcome to springtime in Washington. [Laughter] At our house in Chevy Chase, we've got beds and sleeping bags for those of you who don't plan to travel. I'll pass around a sign-up sheet.

Actually, we begin this morning with the policy go-round, and we'll start with President Rosengren.

MR. ROSENGREN. Thank you, Mr. Chairman. I support alternative B as written for this meeting. In addition, I have a comment on alternative C, although I'm not speaking in favor of it at this meeting.

If one views alternative C as a candidate for a future alternative B should the economy continue to grow more strongly than the SEP forecasts, I would prefer that alternative C be both more clearly different from alternative B and more strongly worded. If we indeed need to move less gradually, I expect that will require more significant changes to the statement's current language.

If the economic outcomes unfold as projected by the Tealbook, by the third quarter of this year, we will have real GDP growing faster than 3 percent, the unemployment rate at 3.7 percent, and a core inflation tenths or less away from our goal. In such a scenario, my view of appropriate policy would not be a 25 basis point increase every other meeting. That is, at some point, it may be necessary to convey that we are no longer moving quite so gradually. If so, then we will soon need to develop language consistent with that posture. I am concerned that the longer we wait as unemployment declines into unfamiliar territory, with inflation near, or at, target, the more we will appear to have eliminated concern about the costs of low unemployment from our announced symmetric loss function.

If the scenario that the Tealbook and I envision continues to come true, we will need to develop language that is more consistent with the monetary policy framework laid out in the January consensus statement. In my view, alternative C should look more like the language that we need should it be appropriate to move more rapidly than 25 basis points at every other meeting.

If moving every other meeting is perceived as being gradual, would a move more frequently than that or by increments larger than 25 basis points still be appropriately characterized by the term “gradual”? Put differently, if we find ourselves well below full employment and at our inflation target, the balance of risks in the statement should appropriately reflect that assessment. While we may not yet be at the point of needing to make these adjustments to our language and our policy, significant fiscal stimulus at this stage of the cycle runs the risk of a rather unbalanced economy. If it proves to be the case that the Tealbook or even my forecast is coming true, monetary policy will need to be more restrictive, and we should be preparing our language, and thus our path to such actions, for such a possibility. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President Bullard.

MR. BULLARD. Thank you, Mr. Chairman. Yesterday I talked about the very low level of real safe rates of interest in today’s economy—the so-called phantom menace r^* . This remains a critical issue for this Committee as we continue gradually raising the policy rate. President Williams suggested yesterday—and has in previous meetings also—that his point estimate of r^* is 50 basis points, which would put the neutral federal funds rate at about 250 basis points. I suggest that there’s substantial probability that the natural real rate is lower

than 50 basis points, easily zero, and, just as easily, much less even than that—well into negative territory. I would note that many real rates globally remain negative today.

I do not see the secular forces that have driven the natural real rate to these low levels as likely to abate over the forecast horizon. On this, I agree with President Williams. There's little to no evidence of mean reversion in this key variable at this juncture, and it's simply low and likely to stay low.

A lot of market commentary and some Committee remarks suggest that the current macroeconomic situation may influence r^* . In my opinion, we should refrain from thinking along this line. This variable is low because of long-run secular trends that have developed over 30 years, and these trends are not likely to change quickly. The good news is that we can still react to cyclical developments as appropriate. Many fiscal policy developments that have been highlighted at this meeting, for example, should show up in the output gap term in a Taylor-type policy rule. Whether r^* is low or high, we can still adjust policy appropriately in response to developments of this nature.

Just to illustrate how important this issue is, I recall being on staff at the Fed and advising then–St. Louis bank President Tom Melzer during 1994. The policy rate during that cycle never fell below 3 percent, and the Committee raised the policy rate 300 basis points in a single year. It was a completely different era, but I'm a little bit worried that that era enters into our empirical estimates of what we think is going on today and probably has some influence over our empirical characterizations even of today's economy.

Adjusting r^* appropriately helps take account of this. I liked President Kaplan's comments given yesterday. The economy is much more sensitive to interest rate movements

today than it has been historically. For that reason, I think there's a greater risk that we can overdo our attempt to return to normal monetary policy.

What's the upshot for thinking about policy today? A lot of monetary policy is not the policy move itself, but the projection of the future path of policy. We're going to look very "hawkish" if we project substantial rate increases into the future in this interest-sensitive environment and the market starts to believe us. Right now, they don't believe us. Today the market thinks we will end the normalization cycle at about 2½ percent, and that that will be sufficient to maintain inflation near our 2 percent target. I think the market is right. I think 3 percent on the policy rate is on the high side of neutral, and 2.5 percent on the policy rate, which is just a few moves away from where we are today in our normalization cycle, would be mildly restrictive and begin to put downward pressure on inflation and inflation expectations even while those variables have not yet come back to our target.

What should we watch in order to know if we're being too restrictive through the spring and summer here? One variable that I think is important is market-based inflation expectations. I think they send a valuable signal in this regard. In my opinion, they're still too low today. They have come up. But if you correct them for the typical difference between CPI and PCE inflation rates and make a judgment about oil prices, I think they're still too low today.

I like the market-based inflation expectations. I like to think of them as a sufficient statistic because what the market has to do in forming these expectations and placing bets is—and there's real money being bet here—they have to take into account all possible theories of inflation. They have to put different weights on those theories. They have to think about different types of data and different possible interpretations of the data. They're also very responsive to current market developments, which I like because I think that gives a market

signal back to us about where our policy stands. They also have to take into account what they think the current Committee is likely to do over the forecast horizon and put it all together into an expectation of where they think CPI inflation is going to be.

So I think this gives us a great signal. It's too low today. If we come off as too "hawkish," the inflation expectations might start to sink again, and I think that would be a signal that we should slow down. So I agree with President Kashkari's comments yesterday that we should watch developments in this regard carefully.

Similarly, I think the yield curve can provide an important signal for this Committee. I think the yield curve slope is okay for today, but further flattening through 2018 would be very concerning to me. I would regard yield curve inversion as a sign of overly aggressive monetary policy. But if we get to that point, it will be too late. So the time to have the debate and watch the yield curve and the yield curve slope is now. If I have it correctly, the 10-year/2-year yield curve slope is about 50 basis points. I'm not really interested in seeing it go to 30 or 25 basis points. I think what could happen in that environment is that, for instance, a global shock of some kind could easily send long-term rates lower, and you'd end up with an inverted yield curve. So you want to have some cushion there—at least 50 basis points. I'd like to see 70 basis points. So yield curve flattening is something I'd want to watch carefully, especially so in the low-inflation environment that we're in today.

Previous incarnations of this Committee had the idea that there was a tradeoff between taking some recession risk and possibly being able to drive inflation lower. So the whole era in the '80s, the '90s, and maybe even the 2000s was about trying to get inflation lower and lower over time. And the Committee actually talked about, "Well, you know, we'd be taking some

recession risk, but if we did get a recession, that would get inflation closer to our longer-run target.” President Evans has talked about this in recent commentary.

That tradeoff doesn’t exist today. The whole idea when I was growing up in the area of macroeconomics was that either you should be neutral or you should be “hawkish.” The idea was, if inflation was too high, you were still trying to gain credibility, as in the Volcker disinflation, and you were trying to get inflation down to the 2 percent level, and markets were always thinking that you were going to surprise them and not maintain your target. We don’t have that today. We haven’t had an inflation experience of that kind for a long time in the U.S. economy. So we don’t have that tradeoff today, and it’s unnecessary to take that recession risk in order to keep inflation under control.

Let me now turn to the statement and press conference issues. I do support alternative B for today. I think the key word for today is “continuity” with the previous Chair and the previous policy, and we want to show that the Committee is a committee and still on course—that we have our further gradual pace of increases continuing.

I think there’s an unnerving conflict between paragraph 1 and paragraph 2 in the sentences that were added to the statement. I’m not sure how this is going to come off. I think it might be rather awkward during the press conference.

The added sentence in paragraph 1 suggests that the first-quarter data have been weaker than expected. I noted yesterday that the Atlanta Fed and Macroeconomic Advisers and others that track first-quarter GDP very closely have now fallen below 2 percent. So you do have these near-term data that are very weak. We’re trying to acknowledge that in the first paragraph, but then the added sentence in the second paragraph says that “the economic outlook has strengthened in recent months.” That is, I think, a dissonance that we don’t usually have in this

type of statement. I'm not really sure that we can do anything about it. I think maybe in the press conference, you could say what has been said around the table here, I think—that first-quarter data have been weak, but we're looking through that because we think there are other aspects of the situation, including possibly residual seasonality, that are going to vindicate our view that the economic outlook has strengthened in recent months.

I think paragraph 4 continues to need fixing. It's not a topic for this meeting, but I think it is a topic in the near term. I think the only words that matter in this paragraph are the words "further gradual increases." That is our forward guidance. Everything else has been put in there in the past and, I think, has very little relevance today. I've been keen to get out the idea that the federal funds rate is still below the neutral rate. As I've been talking about yesterday and today, I think we're actually pretty close to the neutral rate—or at least there's a lot of probability that we're pretty close to the neutral rate—so we should not be saying that we're well below anymore. That was something that we would say when we were at zero, but we're not at zero anymore. We've had a successful liftoff, and now we're going to be over 150 basis points on the policy rate after this meeting.

At the press conference, I think there is a risk that this will come off as too "hawkish" and insufficiently sensitive to incoming data. I think the markets will bake in four rate hikes for 2018. I actually think it's premature to bake in that much tightening. Markets will immediately start talking about possibly more than that. So I think the agenda, in my mind, is to emphasize data dependency more than we have been in recent commentary.

I am concerned that if we get this train moving out of the station, it may be hard to reverse it later. I do not think we have a lot of credibility on data dependence. We have said that we're data dependent, but we have not shown an inclination to react very aggressively to

incoming data. So I think markets might pencil this in and take on a more “hawkish” stance on the part of the Committee in a way that we don’t like later if the data do not go our way later on. And often the data do not go our way, so we’ll need to be careful about that.

I think my preferred tone in the press conference would be, let’s see how the data evolve through the spring, and then we can evaluate at that point what we want to do in the second half of the year. We have penciled in a median path of rate hikes. But this does not mean that the Committee is necessarily going to go in that direction, depending on how the data evolve during the year. So those are my comments for today, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President Williams.

MR. WILLIAMS. Thank you, Mr. Chairman. I support alternative B as written. At our January meeting, I said that if the economy performed about as expected, I would support an increase in the federal funds rate at today’s meeting. While the economy has performed about as expected, the incoming data indicate that the economy has maintained the solid momentum seen last year, and the inflation data have been right on track with my forecast of a gradual move back to our 2 percent longer-run target by next year. Indeed, the only real news is the greater boost coming from fiscal policy—news that points to an even more robust outlook than I had anticipated. Under this outlook, it’s appropriate to continue our process of gradually removing policy accommodation by raising the target range for the federal funds rate today.

Furthermore, as I mentioned yesterday, my SEP submission calls for three additional rate increases this year and another four next year. So, under my 2½ percent estimate of the long-run neutral funds rate, these increases lead to the funds rate exceeding the longer-run neutral level a year from now, and it’s for the reasons that President Bullard said. My views are that the neutral rate is low, but, at the same time—taking into account the cyclical state of the economy, very

low unemployment, and inflation actually overshooting the target—it makes sense that we would have the funds rate above the long-run neutral level in that kind of cyclical situation.

By comparison, a majority of the SEP participants have overshooting of their long-run federal funds target by the end of next year, and most have that in 2020. In this regard, I'm going to mention again what I talked about last meeting—that, due to the likelihood of a moderate overshoot of the long-run neutral rate, I think the expiration date is nearing for the forward-guidance language in paragraph 4 of the statement, which states that “the federal funds rate is likely to remain, for some time, below levels that are expected to prevail in the longer run.” Today is not the day for such a change in the statement language. I do think that day is nearing. Thank you.

CHAIRMAN POWELL. Thank you. President Bostic.

MR. BOSTIC. Thank you, Mr. Chairman. I support the policy action in alternative B as written. We need to get our monetary policy back to a neutral stance. And since we are not there now, this action is appropriate.

There are three further points that I would like to highlight. First, I am not overly concerned at this point that the economy is on the cusp of overheating, as the evidence does not suggest a spiking inflation dynamic. Given that, I will not be supportive of actions that move us much beyond neutral in the absence of such evidence.

Second, I do not think that several data points slightly above the 2 percent target will necessarily indicate an overheating has arrived. Several SEP submissions, mine included, had inflation slightly above 2 percent for several years. I think this can be wholly appropriate both in terms of policy and for ensuring the public, market watchers, and market participants see the 2 percent target as an average and not a ceiling. I think there would be value in the Committee

discussing and debating the issue of what overheating might look like in future meetings.

President Bullard's highlighting this morning his view that market-based inflation expectations are a sufficient statistic is a good example of what I think is needed.

Third, I believe that continuing to make monetary policy decisions in a careful and predictable way is particularly important in the current turbulent and unpredictable environment in Washington. At my previous board meeting, I was struck by the fact that, even though the directors across the Sixth District were broadly in favor of a rate increase, their support was coupled with trepidation because they are much more uncertain about the economic outlook after the recent announcements of changes to U.S. trade policy. My directors were grateful that our policy has not lurched back and forth, and business leaders across my District expressed the same sentiment.

In the current context, the stability we project is assuring and psychologically calming. Moving forward, we must be very careful not to undermine this in any way. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President Harker.

MR. HARKER. Thank you, Mr. Chairman. I support alternative B as written at this meeting. Policy remains accommodative, and I'm more confident that inflation will rise and that growth will be sustained. But because inflation has rarely been above 2 percent over the past 20 years, I believe that we should await firm evidence that inflation is accelerating toward our target before we signal a more aggressive policy stance.

Until that occurs, I think it would be premature to indicate that our commitment to a gradual removal of accommodation has changed. Thus, my position remains the same as it was at our previous meeting. Policy appears to be fairly accommodative, yet we have not seen a

significant acceleration in inflation. This may indicate, as others have mentioned, that the natural rate of interest is unnaturally low and that we can be unusually patient in removing accommodation. Further, I think the degree of uncertainty is abnormally high, and the increased uncertainty is being reflected in many measures, including increased asset market volatility. I believe that we can be patient and that patience is the prudent course of action, as mentioned by President Bostic. I prefer to wait, therefore, until there's firmer evidence that inflation is accelerating before changing the gradual course of removal of accommodation.

I also found the language in alternative A emphasizing the symmetric nature of our inflation target as welcome. It struck the right balance, in my view. I don't believe we should attempt to orchestrate an overshoot, but I think additional emphasis that we are not concerned with a modest overshoot helps communicate that our 2 percent target is a midpoint and—as President Bostic and others have said—not a ceiling.

I would welcome such language in alternative B in future statements. I'm not recommending that today. And I think it may raise expectations of inflation and help us reach our target sooner. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President Mester.

MS. MESTER. Thank you, Mr. Chairman. I support alternative B and the statement as written. The medium-run outlook for economic growth and labor markets has strengthened, and I anticipate that growth will be above trend and the unemployment rate below its longer-run level over the forecast horizon.

Under these conditions and with longer-run inflation expectations stable and recent inflation readings firmer, I'm more confident that inflation will gradually rise to 2 percent on a sustainable basis. I expect this goal to be reached sometime over the first half of next year. With

this kind of forecast, continuing a gradual removal of accommodation is appropriate and seems the best strategy to balance the risks to achievement of both of our policy goals. The actual path policy takes will depend on how the economy actually evolves.

Our communications will need to be particularly deft to align the public's policy expectations with the Committee's. We want the public to understand that our projected policy rate path can change if incoming information suggests a material change in our medium-run forecast. If this is well understood by market participants in advance of a change in path, it can help mitigate any oversized reaction.

At the same time, we don't want the public to believe that we'll react to any small change in the data. So we need to be careful not to overemphasize data fluctuations that don't affect the outlook and, instead, focus on accumulated changes in economic and financial conditions and their effect on the medium-run outlook and progress toward our monetary policy goals.

Our communications should help the public and financial market participants understand our consensus assessment of what is signal versus noise in the data. For example, it seems likely that the inflation measures will move up when last March's low readings drop out of the year-over-year measures. Some of that increase will be temporary and likely won't change the inflation outlook. We'll need to guard against market participants over-interpreting the rise in these measures of inflation as a precursor to a significantly steeper policy rate path, which could lead to an aggressive tightening in financial conditions and long yields.

Another future communications challenge will be altering the forward guidance in paragraph 4. The median funds rate path in the SEP, as well as the path in the Tealbook and in many other forecasts, has the rate moving above its longer-run level during the forecast horizon. Yet our statement's guidance indicates that the funds rate is "likely to remain, for some time,

below levels that are expected to prevail in the longer run.” If the funds rate moves up as anticipated, at some point, this sentence will be misleading. We will need to manage carefully how we remove this sentence, in order to avoid having policy expectations in the market tighten too much.

Finally, I appreciate the work that goes into constructing the alternative statements. But I couldn't help be struck by the cover memo on the revised draft statements describing the changes and pointing out how certain phrases are intended to signal something, while others are meant to hint at something. [Laughter] I think our statements would be better communications vehicles if we were willing to say what we meant rather than signaling and hinting. Of course, this would take some major changes to the statement. It might end up longer. But if words are added for the sake of clarity and not verbosity, this should be welcome.

I hope at some point we'll entertain a project to take a careful look at the statement and see how it can be improved as a communications device. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President Barkin.

MR. BARKIN. Thank you. On a personal note, as I said yesterday, I was introduced to the Fed during my six years on the Atlanta board, from January 2009 to December 2014. During that time, our board voted 156 times on discount rates and never once voted for an increase or a decrease. I'm happy today to mix it up and support alternative B. [Laughter]

The logic for normalizing rates is straightforward and consistent with that articulated by President Bostic. Our current policy is accommodative in an economy that is, by a variety of measures, running hot. With inflation finally hitting our target, we're no longer being pulled in opposite directions by the two sides of the mandate, and we keep inflation expectations anchored by moving now.

I do think of myself as data dependent and open to evolving views based on what happens. In line with what I said yesterday about my perceived sense that inflation is somewhat stable, a significant nontransitory deviation on either side of our target would make me take note. And with labor markets already very tight, I'll be monitoring my assumption on productivity as well and its implications.

I want to join Presidents Williams, Bullard, and Mester in making a final comment on the sentence about the federal funds rate remaining below levels expected to prevail in the longer run. Now, we take that out of both alternatives A and C but for different reasons, and that just made me wonder whether the sentence has outlived its usefulness. But, like everybody else, I'm happy to leave that discussion for our next meeting.

CHAIRMAN POWELL. Thank you. Governor Quarles.

MR. QUARLES. Thank you, Mr. Chairman. I support alternative B as written. I think that the additional sentence on the strength of the economic outlook in paragraph 2 provides context for the rate increase against the background of the disappointing data that are reflected in paragraph 1. That correctly signals that we view this near-term softness as being transitory. I think that's totally consistent with the view I expressed in my maiden intervention in this group regarding the aircraft analogy that we should not chase the needles. And, as a consequence, I continue to believe that a policy of gradual tightening is most consistent with meeting our dual mandate.

Inflation is moving up to target, but only gradually moving up to target. We still have only moderate—or maybe the right word is “modest”—wage growth. The possibility of further slack in the labor market either because a portion of the demand for labor will continue to be met by an outsized contribution from labor force participation or because, as Governor Brainard and I

discussed yesterday, the changes in the percentage composition of educational attainment in the workforce have resulted in a decrease in the natural rate of unemployment that's larger than any of us are currently expecting—for one reason or another, something is going on there, so I think we can afford to be relatively patient.

But because of the size of the upward revision to the medium-term outlook, I do think that the rate path will have to be a bit steeper than I thought in December. So, as a consequence of balancing all of that, I moved my expectation of the number of increases—which was at three in 2018, two in 2019, and two in 2020—to three, three, and three, sort of consistent with a gradual increase.

As I also mentioned at the previous meeting, I think we have to keep our eye on where we think the federal funds rate is going to land in the long run. I have a relatively optimistic outlook for potential GDP growth, so my projections regarding the longer-run real GDP rate are already considerably above where the staff's are. I would expect the natural rate to move up even higher if it becomes apparent that the factors that have been holding down that equilibrium rate—weak investment, low productivity growth, and global conditions—are turning. And there are reasons to think that they may be turning—maybe less so about productivity growth, which is a longer-run thing. Obviously, the higher the equilibrium rate, the more accommodative our current stance, and the greater the need to tighten policy would be in the future. And in the interest of transparency, which I think is important not only in regulatory policy, but also in monetary policy, I am SEP respondent number 4.

CHAIRMAN POWELL. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Mr. Chairman. I support alternative B as written. I continue to believe that removing accommodation in a gradual and patient manner gives us the best opportunity to extend this economic expansion.

I do believe that cyclical inflationary pressures are building, but I also believe the effects of automation are also building. The trends in automation, as we've said many times, are reducing the pricing power of various types of businesses, causing them to invest more in technology in order to replace people and much more aggressively seek scale economies through merger activity, all of this in order to defend margins and prepare for increasing loss of pricing power in the future.

In this regard, I appreciated the discussion in the Tealbook regarding the relationship between increasing concentration and pricing power. Indeed, my conversations with business executives suggest that concentration, in fact, is not creating more pricing power. In fact, I think causality now runs in reverse. It is the lack of pricing power that is causing businesses to increase their scale of operations and merge with others in order to protect margins. In short, lack of pricing power is motivating businesses to increase concentration.

So, taking all of this into account, I worry a little less about inflation running away from us. I expect it to firm, but, I think, gradually. I worry much more, though, about excesses and imbalances building in the economy and in the financial markets because of an overshoot of full employment and the other effects of historically low interest rates. Based on that, I've penciled in three rate increases for 2018, three for 2019, and only two for 2020, and the reason my path may be flatter than others is, I still believe the neutral rate is around 2%. I guess a better way to say it would be 2½ to 2¾. [Laughter] I'm not optimistic about the neutral rate moving up because of demographic trends, productivity trends, and then a third issue—the increasing debt-

to-GDP path of the U.S. government, which I do believe will ultimately become a headwind for economic growth in the United States. I hope I'm wrong.

I'm increasingly concerned about substantial increases in the amount of U.S. government debt to be sold as well as the current tendency of debt market participants to pare back on duration. Because of those two aspects, I would not be surprised to see the Treasury yield curve steepen even as the Committee continues to raise the federal funds rate. Obviously, in an economy that is increasingly sensitive to rate increases, I'll be watching this dynamic very closely. Thank you, Mr. Chair.

CHAIRMAN POWELL. Thank you. President Evans.

MR. EVANS. Thank you, Mr. Chair. My preferred policy decision for today is to maintain the funds rate at its current target range of $1\frac{1}{4}$ to $1\frac{1}{2}$ percent. My appropriate monetary policy rate path is a bit steeper than I submitted in December. Today I have three rate increases in 2018. Nonetheless, I still think it would be better to hold rates steady today. There's good reason to expect inflation to move higher soon, but we haven't seen it yet in the year-over-year data. Pausing now and waiting until our May or June meeting would allow us to confirm that inflation is indeed moving up. And if it is, there's still plenty of time to raise rates three times this year. Waiting for confirmation of the expected increase in inflation before moving rates would send an important signal to the public of our firm commitment to a symmetric inflation target.

That said, the consensus here for alt-B is undeniably strong, so let me turn to a few comments about my expected appropriate policy rate path over the medium term. I thought the special discussion in January about inflation forecasting was very informative for our policy deliberations. I thought the discussion yesterday was extremely helpful in forming my thinking

about that, too. In particular, the discussion of standard inflation specifications, like the Board staff's model and Jeff Fuhrer's analysis, was excellent.

One clear message was that it is difficult to generate undesirably high inflation with our currently preferred specification for the Phillips curve, which is non-accelerationist and has a very flat slope. That is, even with an unemployment rate of $3\frac{1}{2}$ percent, which I take to be 1 percentage point below the natural rate, the non-accelerationist, flat Phillips curve has a lot of difficulty predicting inflation rising beyond $2\frac{1}{2}$ percent. To generate a serious sustained increase in inflation, as we sometimes see in Tealbook alternative scenarios, inflation expectations would have to rise significantly from their current levels, or the Phillips curve would have to steepen considerably. I won't say these things can't happen, but the risks seem small at the moment, and we don't really understand the factors that would cause them to change. That would be important to learn more about.

Importantly, as we saw in Todd Clark's work as well as that of the Board staff, inflation expectations currently appear to be stubbornly below our 2 percent target. In addition, we currently see little evidence that resource pressures are leading to outsized wage or price increases. From the non-accelerationist Phillips curve viewpoint, this means policy normalization can proceed at a modest pace. Of course, I do take the point that the risk can change—as the Tealbook alternative scenarios rightly remind us, that's something to watch out for.

So, as I mentioned, my SEP has three rate increases in 2018. I then have the funds rate moving up to $2\frac{3}{4}$ percent at the end of 2019, which is my assumption for the long-run neutral funds rate. Under this path, resource pressure and firming inflation expectations should bring us close to 2 percent inflation by late 2019 and likely would generate a small overshoot of our

2 percent objective in 2020. At that point, if the rise in inflation is accompanied by a comparable increase in inflation expectations, I think it would be appropriate to increase the funds rate target modestly above neutral and then plan to hold it there until inflation returns to target.

I see two virtues to this strategy. First, by not prematurely imposing a restrictive funds rate, it helps ensure that we actually do get to 2 percent inflation. And with the lags in the effects of monetary policy taken into consideration, it builds in a significant chance of modestly overshooting our target. Such outcomes would help solidify the public's understanding that our inflation objective is symmetric— a prerequisite for achieving our monetary policy mandate. In contrast, if we communicate a steep and notably restrictive baseline policy rate path before we actually see rising inflation, we risk cementing inflation expectations below target.

Second, I view my prescription as prudent risk management, reflecting my concern that hidden headwinds might once again frustrate the attainment of our inflation objective. We've experienced this before both here and around the world. Certainly over the past several years, most of us have forecast inflation promptly getting back up to 2 percent, only to be disappointed. By continuing to go slowly in the tightening of monetary policy, perhaps extra slowly, we'd better guard against these possibly lurking headwinds.

In sum, I still think we should guard against prematurely declaring victory and communicating an overly aggressive path of rate increases. In my view, the risk–return calculus still tells us we should be safeguarding against downside inflation risk.

I have noted many comments about how paragraph 4 and other parts of the statement could stand some updating and change. And I look forward to the Committee's decision on how to describe the funds rate going above our neutral rate—as to whether we would call it restrictive in order to achieve an increase in unemployment and a reduction in inflation, or perhaps we

could use the less direct but always useful terminology “to continue the expansion longer than it might otherwise be.” [Laughter] Thanks, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President George.

MS. GEORGE. Thank you, Mr. Chairman. I support alternative B. As paragraph 2 highlights, the economic outlook has strengthened in recent months, and my current projections compared with the December SEP show stronger economic growth, a lower unemployment rate, and inflation moving above 2 percent. I maintain four rate increases as appropriate in 2018, and my view of appropriate policy has the funds rate reaching its longer-run level in 2019, reflecting an economy that’s growing at an above-trend rate, with an unemployment rate well below nearly all estimates of its longer-run level and inflation consistent with our price stability mandate. Depending on how it unfolds, this strengthening in aggregate demand at a time when the economy is operating beyond its potential will necessitate ongoing close monitoring of labor market conditions, inflation dynamics, and financial conditions.

As a number of others have noted this morning, as we look ahead, communicating the path of monetary policy becomes more challenging, I think. A wide range of views and models, from the Tealbook baseline assumption regarding the federal funds rate, the projections of nearly all of our simple and optimal policy rules, as well as the median SEP number, imply that the Committee will transition directly from a long period in which the funds rate has been below its longer-run level to provide policy accommodation in support of economic growth to a period in which the funds rate will move above its longer-run level. As that transition approaches, the Committee should discuss the implications of such a path to inform our communication as we assess and adjust our views of appropriate policy in line with evolving economic conditions. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. Governor Brainard.

MS. BRAINARD. Thank you, Mr. Chair. Although last year was marked by a disconnect between the continued strengthening in the labor market and the step-down we saw in inflation, mounting tailwinds at a time of full employment and above-trend growth tip the balance of considerations, in my view. With greater confidence in achieving the inflation target, continued gradual increases in the federal funds rate are likely to be appropriate. I favor a 25 basis point increase in the target range of the federal funds rate at this meeting.

I've been concerned that the underlying rate of inflation—the rate of inflation the economy will converge onto when the labor market is at full employment—has fallen below the Committee's target of 2 percent. Experience in other countries suggests it is very difficult to raise an underlying inflation trend that's been running below policymakers' target for several years. But I'm hopeful the anticipated tailwinds may help re-anchor inflation expectations at the symmetric 2 percent objective.

Of course, under the gradual approach, it's conceivable we could see a mild temporary overshoot of the inflation target over the medium term. In fact, that is now suggested by the median SEP path. If such a temporary overshoot was to occur, it would be consistent with the symmetry of our target and could help nudge underlying inflation expectations back to our target. Recent research has highlighted the downside risks to inflation and to longer-run inflation expectations that are posed by the effective lower bound on nominal interest rates, and this research suggests the significant long-term cost of allowing underlying inflation to slip below target in today's "new normal" conditions.

I will also be attentive to the emergence of any imbalances that could jeopardize the goal of re-anchoring inflation expectations, recognizing that risks of imbalances could rise if the

unemployment rate falls to historically rare levels. We should be vigilant because we don't have extensive experience of an economy having such low unemployment rates and can't be sure how that might evolve.

In terms of inflation, I'll want to monitor closely not only prices, but also wages and various measures of inflation expectations. Although I currently believe that it's unlikely to occur, if there were an outbreak of inflation like the one that occurred in the late 1960s or indications of some unanchoring of inflation expectations to the upside, I have confidence we would act decisively. But I put relatively low probability on such an outbreak for the reasons that President Evans discussed.

Instead, like President Kaplan, I believe the experience of recent decades suggests we should be particularly attentive to the risk of financial imbalances. Although asset valuations are currently elevated, overall risks to the financial system remain moderate because household borrowing is still moderate. Risks associated with liquidity and maturity transformation have declined, and the banking system is well capitalized.

History suggests, however, that a booming economy can lead to a relaxation in lending standards. And the excessive borrowing that results can complicate the task of monetary policy. That's why I would be reluctant to see our large banking organizations releasing the capital and liquidity buffers that they have built so effectively over the past few years at a time when valuations are stretched and cyclical pressures are building.

I would not want to underestimate the challenge we face of calibrating monetary policy to sustain full employment and ensure inflation is re-anchored at 2 percent while adjusting to a large addition of fiscal stimulus at a time when resource constraints are tightening and the economy is growing above trend. That brings me to two small suggestions for modifications to

the future evolution of the statement. First, in the months ahead, I'd be open to changing the sentence in paragraph 3 that states we're maintaining an accommodative stance in order to support "strong labor market conditions and a sustained return to 2 percent inflation." I think it will soon be more accurate to suggest that the stance of monetary policy is oriented to sustaining strong labor market conditions and, of course, getting inflation back to 2 percent—and then, as the economy evolves further, to simply sustaining full employment and the 2 percent inflation target.

As part of that evolution, I'd anticipate wanting to move away from describing the stance of monetary policy as "accommodative" to "appropriate." So we don't need to pronounce on where the federal funds rate is relative to the neutral rate at each meeting.

That brings me to the second point. I continue to support charting a well-telegraphed path to eliminating the forward guidance in paragraph 4, and here I'm in good company, I think. Presidents Bullard, Williams, Mester, Barkin, and probably others have all spoken about that this morning. It would be reasonable, I think, in view of the boost to demand that we have seen or regard as being likely, to expect the neutral rate in the medium term to rise above its longer-run value. In my baseline projection, I expect current tailwinds to boost the neutral rate over the medium term but leave little imprint on the long-run neutral rate. And, in fact, that's consistent with what we see in market measures of the long-run neutral rate. That would argue for eliminating the sentence that says "the federal funds rate is likely to remain, for some time, below levels that are expected to prevail in the longer run." That's certainly not consistent with my medium-term SEP submission, and I'm not alone. I think 8 of the 15 participants show their federal funds rate above their longer-run federal funds rate by 2019, and 12 of 15 participants show that by 2020. In fact, that is also where the median is by 2020.

Of course, we could see the long-run neutral rate increase if we saw, for instance, a large contribution to potential. But it's not clear to me why we need to provide qualitative forward guidance on where we expect the short-run and the long-run federal funds rate to be in relation to each other at a time when policy normalization is well under way.

But these suggestions are all intended for future consideration by the Chair. For today, I support alternative B.

CHAIRMAN POWELL. Thank you. President Kashkari.

MR. KASHKARI. Thank you, Mr. Chairman. I support alternative B in the context of continuity, which I do think is important for the Committee. But, just looking at the data, I would prefer alternative A. And because I'm not a voter, I can have it both ways. [Laughter]

I continue to focus on three key indicators. The first is core PCE inflation, the second is inflation expectations, and the third is measures of labor market slack. I do see some progress in core inflation and inflation expectations, but we're not there yet, so a modest level of accommodation remains appropriate.

You know, in terms of slack, as I was preparing for this meeting, I had a flashback to engineering school—so, 25 years ago. I'm going to share with you an analogy—and forgive me, because it's going to sound hyperbolic, but I'm going to connect the dots. In engineering school, we learned about the Three Mile Island nuclear accident. And I'm not suggesting that we're on a path toward that [laughter], so just bear with me. When we studied the accident, it really came down to one gauge that was broken in the control room. The engineers were trying to control the nuclear power plant, doing their jobs appropriately. But one gauge was broken, and they didn't realize that gauge was broken. So they kept making other changes, not realizing the gauge was broken, and that's what led to the meltdown.

The reason I thought of that was, we're making many different assessments of our outlook for the economy: the output gap—is the economy overheating?—and our outlook for wages, for inflation, and for inflation expectations. All of those come back to one gauge: our measure of slack in the labor market. And my observation over the past two years is, our gauge is broken. We just don't know how much slack is in the labor market, and I, for one, have been surprised over the past two years how many Americans have come back into the job market. You know, I keep thinking we're close to maximum employment, and then I keep getting surprised. And yet it's been in a context of modest nominal wage growth.

Mr. Chairman, in your testimony a couple of weeks ago—maybe it was a week ago—you said that the natural rate of unemployment could be as high as 5 percent or as low as 3½ percent, which I thought was an appropriate range, expressing the uncertainty that we face. But a different way of expressing that uncertainty is not only in terms of the natural rate, but also in what's the effective unemployment rate today. Is 4.1 really a meaningful measure in light of people who have left the labor force? And I think we're overly focused on and influenced by this 4.1 percent number. If we really thought maybe 5 percent was the right unemployment number representing current slack in the labor market, in a situation of low nominal wage growth, modest inflation, and modest inflation expectations, would we be raising rates now? Probably not.

I've said this before: If you want to assess supply and demand in a market—the labor market—we have to look at wages. And for me, I want to see more wage growth, and that'll give me more confidence that we're actually, in fact, using up the slack.

The last thing is, I don't think I have a better assessment than the rest of you of slack in the labor market. I just think none of us know. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. Vice Chair Dudley.

VICE CHAIRMAN DUDLEY. Thank you. I support alternative B as written. Given the economic outlook, it's appropriate to continue gradually removing monetary policy accommodation. I am supportive of keeping changes to the statement to a minimum at this particular meeting to signal that even as we transition to the new Chair, the FOMC's reaction function has not changed. That said, I also believe we do need to acknowledge that, while our reaction function is broadly the same, the outlook has changed, especially on the fiscal side. Thus, I am supportive of including language that acknowledges that the medium-term outlook for economic activity has improved. I hope that our readers will understand that this is due mainly to a sharp swing in fiscal policy toward stimulus.

As I mentioned yesterday, I believe that the risks of economic overheating have increased. This is one reason why I now have the federal funds rate path moving above my 3 percent long-run estimate of the federal funds rate in 2019 and 2020. As I see it, there's a high likelihood that the story will change from removing monetary policy accommodation to having to shift to a somewhat restrictive monetary policy stance. Obviously, how tight that will be will depend importantly on the strength of the economy, the buoyancy of financial market conditions, and the inflation trajectory, among other factors.

If we are making that transition, I also agree with others that we do really need to take a look at the language in paragraphs 3 and 4. That language is stale, and I think it soon will, in fact, not actually be accurate.

CHAIRMAN POWELL. Thank you. And thanks, everyone, for your thoughtful comments.

As I see it, the challenge we face is to strike an appropriate balance in our policy between the two sides of the mandate amid real uncertainty about the location of, for example, the natural rate of unemployment. We want to avoid pushing resource utilization too hard, as this could result in unexpectedly high inflation or financial imbalances and ultimately threaten the ongoing economic expansion. But we also want to promote a rise in inflation to around 2 percent on a sustained basis, with well-anchored inflation expectations at 2 percent. The policy action that we're considering today, as well as the path of further gradual rate increases broadly identified in the SEP, seems to me to strike that balance well.

When all is said and done, I heard considerable support for alternative B as written. And let me now ask Jim Clouse to make clear what we're voting on and call the roll.

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

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. Now we have two sets of related matters under the Board's jurisdiction: corresponding changes to the interest rates on reserves and discount rates. I first need a motion from a Board member to increase the interest rates on required and excess reserve balances to 1¾ percent, effective March 22, 2018.

MS. BRAINARD. So moved.

CHAIRMAN POWELL. 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, New York, Philadelphia, Cleveland, Richmond, Atlanta, St. Louis, Kansas City, Dallas, and San Francisco at 2¼ percent, effective March 22, 2018. It will also encompass approval by the Board of Governors of the establishment of a 2¼ percent primary credit rate by each of the remaining Federal Reserve Banks, effective on the later of March 22, 2018, and the date such Reserve Bank informs the Secretary of the Board of such request. The Secretary of the Board would be authorized to inform such Reserve Banks of the approval of the Board of Governors on such notification by the Reserve Bank. Lastly, this vote will also encompass establishment of the rates for secondary and seasonal credit under the existing formulas specified in the staff's March 16 memo to the Board. Do I have a motion?

MS. BRAINARD. So moved.

CHAIRMAN POWELL. Second?

MR. QUARLES. Second.

CHAIRMAN POWELL. Without objection. Thank you very much. The date of our next meeting is Tuesday and Wednesday, May 1 and 2, 2018. As usual, we have boxed sandwiches and salads in the anteroom. I believe they're available now, if anyone is hungry. And we'll be showing the press conference at 2:30 in the Special Library. Thanks very much. Great to see everyone. See you again in May, if not sooner.

END OF MEETING