

**Meeting of the Federal Open Market Committee on  
September 19–20, 2017**

A joint meeting of the Federal Open Market Committee and the Board of Governors was held in the offices of the Board of Governors of the Federal Reserve System in Washington, D.C., on Tuesday, September 19, 2017, at 1:00 p.m. and continued on Wednesday, September 20, 2017, at 9:00 a.m. Those present were the following:

Janet L. Yellen, Chair  
William C. Dudley, Vice Chairman  
Lael Brainard  
Charles L. Evans  
Stanley Fischer  
Patrick Harker  
Robert S. Kaplan  
Neel Kashkari  
Jerome H. Powell

Raphael W. Bostic, Loretta J. Mester, Mark L. Mullinix, and John C. Williams, Alternate Members of the Federal Open Market Committee

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

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

James A. Clouse, Thomas A. Connors, Evan F. Koenig, William Wascher, Beth Anne Wilson, and Mark L.J. Wright, Associate Economists

Simon Potter, Manager, System Open Market Account

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

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

Matthew J. Eichner,<sup>1</sup> 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

Michael T. Kiley, Deputy Director, Division of Financial Stability, Board of Governors; Stephen A. Meyer, Deputy Director, Division of Monetary Affairs, Board of Governors

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

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

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

David E. Lebow and Michael G. Palumbo, Senior Associate Directors, Division of Research and Statistics, Board of Governors

Antulio N. Bomfim, Edward Nelson, and Joyce K. Zickler, Senior Advisers, Division of Monetary Affairs, Board of Governors

Jane E. Ihrig, Associate Director, Division of Monetary Affairs, Board of Governors; John J. Stevens and Stacey Tevlin, Associate Directors, Division of Research and Statistics, Board of Governors

Steven A. Sharpe, Deputy Associate Director, Division of Research and Statistics, Board of Governors; Min Wei, Deputy Associate Director, Division of Monetary Affairs, Board of Governors

Penelope A. Beattie,<sup>2</sup> Assistant to the Secretary, Office of the Secretary, Board of Governors

Michiel De Pooter, Section Chief, Division of Monetary Affairs, Board of Governors

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

Martin Bodenstein, Principal Economist, Division of Monetary Affairs, Board of Governors

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

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<sup>1</sup> Attended the discussions of the proposed changes to Rules Regarding Availability of Information and developments in financial markets and open market operations.

<sup>2</sup> Attended Tuesday session only.

Mark A. Gould, First Vice President, Federal Reserve Bank of San Francisco

David Altig, Kartik B. Athreya, Glenn D. Rudebusch, and Geoffrey Tootell, Executive Vice Presidents, Federal Reserve Banks of Atlanta, Richmond, San Francisco, and Boston, respectively

Spencer Krane and Keith Sill, Senior Vice Presidents, Federal Reserve Banks of Chicago and Philadelphia, respectively

David C. Wheelock and Jonathan L. Willis, Vice Presidents, Federal Reserve Banks of St. Louis and Kansas City, respectively

Stefano M. Eusepi, Assistant Vice President, Federal Reserve Bank of New York

Edward S. Prescott, Senior Professional Economist, Federal Reserve Bank of Cleveland

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**September 19 Session**

CHAIR YELLEN. Let's get started. Good afternoon, everyone. First, I need a motion to close the Board meeting. This will be, again, a joint meeting of the Board and the FOMC.

MR. FISCHER. So moved.

CHAIR YELLEN. Thank you. Without objection. As you all know, Vice Chairman Fischer has announced that he will leave the Board next month, which means that this week's meeting is his last as a member of this Committee. He'll be back at some point for a proper sendoff, and I'll have more to say then. But I can't let this occasion pass without trying to sum up what Stan's service has meant to me, to the Committee, and to the important job we do here on behalf of the American people.

I count myself very lucky that soon after I became Chairman, Stan agreed to serve as Vice Chairman, and it was also a fortunate development for the FOMC. Few people have ever been as comprehensively qualified to serve as Vice Chairman, and few could have brought the credibility to this Committee and its deliberations that Stan did just by walking in the door.

As a scholar, Stan is revered as a towering figure in the development of macroeconomics and monetary policy. As an international policymaker, he's a proven leader, adept at institution building and crisis management. And as a central banker, even before his service on the FOMC, Stan had already helped Israel navigate through an era of difficult economic challenges, shielding it from the effects of the financial crisis. Stan has, of course, taught and, in effect, recruited a generation of leading central bankers. But I think Don Kohn put it best when he said that all modern central bankers are students of Stan Fischer.

Stan's knowledge and deep expertise greatly strengthened the work of this Committee. Our decisions were better, I'm certain, because of Stan's contributions, and I'm sure that every one of us has gained insight about the economy from Stan. I'm personally very grateful for Stan's wise counsel, his insightful participation in our deliberations, and his strong support for the consensus we seek at each meeting, which is so important to the FOMC's effectiveness.

Outside of this room, Stan has been a tireless leader of the Board and the System. He is surely the most accomplished and respected diplomat to have served on the Board, and, in a very substantive way, Stan was the Fed's ambassador to the world, ably representing us in multilateral settings.

In another sense, Stan has been an ambassador for central banking, speaking with indisputable authority about its vital role in promoting economic and financial stability and using his authority to forcefully defend the need for central banks, such as the Fed, to make monetary policy independent of political influence. Stan has forthrightly defended the Fed's work, implementing financial reforms passed by the Congress, and in other ways has been a highly effective spokesman for the Board and the System.

In addition, he has shouldered less glamorous responsibilities for the Board and the Committee with dedication and, when it was needed, considerable patience. I'm grateful, for example, for Stan's leadership of the communications subcommittee, as I'm sure Stan is grateful he will never again have to mediate [laughter] between the warring factions on fan charts and other potential enhancements to the SEP.

One reason for Stan's success on jobs great and sometimes trying has been the good humor and conviviality he brings to any occasion. Economics has been called the dismal science, but Stan has shown that that doesn't mean one has to be a dismal scientist. Stan's

positive outlook has enlivened our meetings and lightened the burden of our responsibilities. For my part, I will dearly miss my weekly lunches with Stan, during which our discussions spanned the fullest possible range of topics. He has been unfailingly gracious and thoughtful, and it is a great gift to count him not only as an exceptional colleague, but also as a friend.

As many of us have experienced, Stan is an uncommonly decent person: kind and caring with family, co-workers, and everyone he encounters. I found that there are two types of people in the world: those who admire Stan Fischer and those who haven't yet had the pleasure of knowing him.

On behalf of everyone here, Stan, thank you for your superlative service to the FOMC, the Federal Reserve, and the American people. [Applause]

MR. FISCHER. Well, Madam Chair, all I can say is, "So moved." [Laughter]

CHAIR YELLEN. We will miss your contributions in that way as well. Now, one other note regarding transitions—as you recall, at the July meeting the Committee elected Mark Van Der Weide to serve as its general counsel effective at the time that he became the Board's general counsel. Mark became the Board's general counsel on August 20, and his election as FOMC general counsel became effective on that date. Mark, welcome, and best wishes with your new responsibilities.

Okay. Now let's turn to the agenda. Our first item of business is to finalize changes to the Committee's Rules regarding Availability of Information, which deals with FOIA matters. We received a memo from the staff on this subject early this month. To summarize briefly, the Committee issued interim final regulations last December primarily to incorporate certain revisions that were required by statute. As part of that process, the Committee simultaneously

invited public comment on the interim regulations. Only one set of comments was received from the Office of Government Information Services, or OGIS.

The staff recommends that the Committee adopt the substance of one of OGIS's comments by approving the insertion into an existing provision of language noting the availability of dispute resolution services from OGIS as a nonexclusive alternative to litigation in the event of an adverse appeal of a FOIA denial.

The staff recommends that the Committee determine not to adopt the second and third sentences proposed by OGIS because they would be repetitive or because they could create additional legal obligations not required by the statute.

The staff recommends that the Committee approve publication of the amended rules as a final rule in the *Federal Register*. The amended rules would then become effective after the typical 30-day delay following publication. Finally, the staff recommends that the Committee authorize the secretary, in consultation with the general counsel, to take the appropriate steps to reflect these changes in the rules and records of the Committee and to submit the appropriate filings with the *Federal Register*. All of these proposed steps were set forth in the memo by the staff.

Now, first let me ask if there are any questions about the proposal. [No response] Seeing none, I suggest we conduct a single vote on the recommended determinations, approvals, and authorizations. Is there a motion from a Committee member to approve this proposal?

VICE CHAIRMAN DUDLEY. So moved.

CHAIR YELLEN. A second?

MR. POWELL. Second.

CHAIR YELLEN. Thank you. Without objection. Okay. Thank you. That takes us to “Financial Developments and Open Market Operations.” Let me call on Simon to deliver the first part of the day’s briefing.

MR. POTTER.<sup>1</sup> Thank you, Madam Chair. Over the intermeeting period, financial markets responded to a perceived increase in geopolitical risks related to North Korea, domestic political developments that further diminished expectations of near-term pro-growth fiscal measures, and weather events that disrupted energy production and economic activity.

The broad trade-weighted dollar has depreciated roughly 4 percent since the Committee last raised the target federal funds range in June, continuing its year-to-date trend. As you can see in the top-left panel of your first exhibit, coming into this year market participants forecast that the dollar would appreciate against developed and emerging market currencies in 2017, shown by the gray diamonds. Contrary to this expectation, the dollar has depreciated significantly against most foreign currencies, shown by the blue bars.

Market participants have attributed dollar weakness to waning expectations regarding near-term domestic fiscal stimulus, a flatter expected path of the target rate—due in part to a string of below-expectations inflation “prints” in recent months—and an improving economic outlook abroad compared with the United States. Some also view the current Administration as favoring a lower exchange value of the dollar.

Over the most recent intermeeting period, dollar depreciation was particularly pronounced against the renminbi and euro. As you can see in the top-right panel, the renminbi has appreciated about 3 percent against the dollar and 2 percent against the CFETS basket since the July FOMC meeting. Outside of broad dollar weakness, the RMB was reportedly supported by positive views on the Chinese economic outlook and more balanced capital flows. However, market participants were not entirely clear why RMB appreciation had accelerated in recent weeks, particularly against the basket. Other emerging market currencies and assets generally have remained firm, reportedly supported by stability in China this year as well as continued signs of stronger global growth and low volatility in financial markets.

As shown by the red line in the middle-left panel, the euro appreciated 2.6 percent against the dollar over the intermeeting period and is about 14 percent stronger year-to-date. Although short-dated interest rate differentials have been little changed, shown by the dark blue line, market participants widely cite, as a key driver of the euro, expectations that the ECB will gradually shift to a less accommodative stance. Indeed, longer-dated interest rate differentials, shown by the light blue line, have narrowed, supported by strong data in the euro area and expectations that in October

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



the ECB will announce plans to taper its purchase program in 2018. Desk contacts have also noted increasing flows into euro-denominated assets and the perception that the euro had been undervalued as important factors supporting euro strength.

Meanwhile, the yen appreciated about 1 percent against the dollar over the intermeeting period, supported by flight-to-safety flows rather than shifting monetary policy expectations. The BOJ is widely expected to maintain a high degree of accommodation for some time.

Shifts in perceived geopolitical risks concerning North Korea were widely cited by market participants as the most salient driver of asset price action over the intermeeting period. Contacts also pointed to domestic political developments that reportedly weighed on the already low perceived probability of pro-growth fiscal measures being passed in the near term.

The net effect of these factors on asset prices since the July FOMC meeting is summarized in the middle-right panel. Ten-year nominal U.S. and German yields each moved lower by 13 basis points. The S&P 500 index was little changed, on net, over the period but declined around key events and was supported in part by dollar weakness. Also, as shown in the bottom-left panel, the VIX spiked during periods of heightened market uncertainty, though it remains near historically low levels. Filtering through the noise associated with some of the intermeeting events and taking into account the large depreciation of the dollar, financial conditions have continued to ease.

Energy markets were affected by Hurricane Harvey, which caused significant disruption to refineries in Texas and Louisiana. As shown in the bottom-right panel, near-dated gasoline futures contract prices increased significantly while near-dated WTI crude oil prices fell immediately after the hurricane made landfall, as refinery outages were expected to temporarily reduce demand for inland crude and simultaneously decrease gasoline supply. Near-dated gasoline futures subsequently retraced much of the initial move. Longer-dated gasoline futures contracts and TIPS-implied breakevens were relatively little changed, reflecting market participants' expectations that the storm's effect on refining capacity would be temporary. A number of Desk survey respondents expect that the economic effect of the hurricanes might be mentioned in the FOMC statement and the postmeeting press conference.

With regard to monetary policy expectations—the focus of your second exhibit—respondents to the Desk's surveys continued to converge on September as the most likely timing of an announcement regarding a change to reinvestment policy. As shown in the top-left panel, the average probability assigned to this outcome increased to 82 percent from 58 percent in July. The median probability—not shown—was 90 percent, and all but two respondents indicated September as their modal expectation.

Although we did not ask respondents to comment on the expected market effect of an announcement regarding a change to reinvestment policy in this survey,

previous surveys and recent commentary suggest that market participants do not expect substantial price reaction to it.

With respect to the policy rate, on average, survey respondents assigned an effectively zero probability to an increase at this meeting, as shown in the top-right panel. While most respondents continue to point to December as the most likely timing of the next rate increase, the average probability of a rate hike by year-end declined.

The market-implied path of the policy rate flattened modestly over the intermeeting period, as evidenced by the shift from the light to dark blue line in the middle-left panel. Market pricing implies roughly 35 basis points of further tightening through year-end 2018. The means of respondents' probability-weighted federal funds rate expectations given in the Desk's September surveys, the dark blue diamonds in the middle-left panel, also declined slightly since July—the light blue diamonds—and remained very close to the market-implied path.

In explaining the factors behind any change to their policy rate expectations, a number of respondents cited low realized inflation. Furthermore, as shown by the light blue line in the middle-right panel, the average PDF-implied mean of the five-year average annual CPI rate starting in five years ticked down again and is now below its pre-election level.

That said, modal expectations of the path of the target rate—indicated by the gray circles in the middle-left panel—were little changed over the period and remained roughly in line with the medians of FOMC participants' target rate projections in the June SEP, the red circles. With respect to expectations regarding the September SEP, which most market participants view as the main news coming out of this meeting, survey respondents anticipated little change in the median dots. However, a number of written responses highlighted downside risk to the medians and averages of participants' target rate projections, partly owing to uncertainty surrounding the inflation outlook and the Committee's response to this uncertainty.

To provide more context on the observed gap between the market-implied path and the median SEP numbers, the bottom-left panel decomposes the spread between the market and SEP into three factors. As has been the case for some time, the main factor suggested by the Desk surveys to be driving the difference between the SEP and market-implied path is downside risk to the modal outlook, represented as the gray portion of the bars.

With respect to balance sheet expectations further out, the bottom-right panel shows the average PDF of the level of SOMA holdings at the end of 2020, conditional on not returning to the effective lower bound by that time. On average, the highest probability was assigned to the SOMA being between \$3 trillion and \$3.5 trillion. For context, staff estimates using the capping structure and various assumptions on market rates also place the SOMA portfolio at the end of 2020 in this bucket.

Taking into account the 23 percent average probability attached to returning to the effective lower bound, the survey PDFs imply about a 1-in-3 chance that the path of the balance sheet will be consistent with the staff's current assumptions. Scenarios consistent with a larger balance sheet include ones in which demand for reserves and other liabilities is large and the balance sheet normalizes at a high level or one where a downturn in the economy prompts a halt to redemptions and perhaps a new LSAP. One possible explanation for the muted market reaction to the impending change in balance sheet policy is that market estimates of the path of the stock of long-term assets held by the Federal Reserve have not changed by a significant amount.

On the other hand, scenarios with a faster runoff could reflect a view that mortgage rates will be materially lower than our assumptions or, given uncertainty about the future composition of the Committee, a belief that a future Committee might want a faster rundown of the portfolio. In connection with this last point, market participants view the selection of the next Chair as a significant risk event over the months ahead that has implications for all aspects of Federal Reserve policy. I'll now turn the briefing over to Lorie.

MS. LOGAN. Thank you, Simon. I'll start on exhibit 3 with a discussion of money market developments and then turn to updates on reinvestments, foreign reserves management, and reference rates.

Concerns about the possibility of breaching the debt ceiling received attention in money markets during the intermeeting period. As shown by the red line in the top-left panel, rates on bills maturing in October, when the Treasury was expected to exhaust its "extraordinary measures" and deplete its cash balance, increased notably. The increases in yield premiums to hold securities maturing around that time were generally consistent with the size of moves seen in previous debt ceiling episodes but emerged much earlier. Contacts did not agree upon a specific catalyst for this earlier increase but noted that one factor may have been relatively greater uncertainty regarding political prospects for a timely resolution. As shown, bill rates retraced quickly following the recent agreement to suspend the debt ceiling and extend borrowing authority by three months. The brief suspension will allow the Treasury to replenish its "extraordinary measures" and has led market participants to forecast that a new deadline would likely fall during the first half of next year.

Despite the volatility in the bill market, spillover into broader money markets was limited. As shown in the top-right panel, with the exception of month-ends, the effective federal funds rate and overnight bank funding rate both "printed" at 1.16 percent throughout the intermeeting period. Overnight Treasury repo rates and volumes remained stable, and the ON RRP operations continued to go smoothly, with usage, shown in the middle-left panel, averaging about \$115 billion excluding month-ends, lower than the previous period.

The Desk continued to reinvest all principal payments on Treasury securities and agency debt and MBS over the intermeeting period. As outlined in the middle-right panel, over the next intermeeting period, \$19.6 billion in Treasury securities held in

the SOMA will mature. This includes \$10.9 billion maturing in September and \$8.7 billion in October. We are currently in the midst of reinvesting \$26.7 billion in anticipated MBS principal payments for the September monthly purchase period. The purchase operations associated with this period will run through October 13. For the October monthly purchase period, which will run through November 13, our models project agency MBS paydowns of roughly \$24 billion. There are no agency debt maturities over the upcoming intermeeting period. Simon will describe how the Desk would adjust the reinvestment of these payments, should the Committee direct the Desk to initiate the balance sheet normalization program in October.

While MBS reinvestment operations themselves proceeded smoothly during the intermeeting period, the Desk identified an error in the calculation of the reinvestment amount for the July monthly purchase period. The Desk purchased approximately \$2.3 billion less than the \$26.2 billion reinvestment amount for that monthly period. Following standard procedures, these earlier uninvested principal payments were added to the August monthly purchase period. We have since further enhanced controls in order to lower the probability of such errors in the future.

With regard to foreign reserves management, as you may recall, last year the Desk overhauled the framework used to invest foreign reserves held by the SOMA and the Treasury's Exchange Stabilization Fund, or the ESF. The ESF and the SOMA portfolios have historically been managed identically. Working with the Foreign Currency Subcommittee and U.S. Treasury officials and employing this new framework, we recently completed the first annual review. This included reviewing the policy purpose and investment objectives of the reserves, analyzing the liquidity need, and setting risk parameters for portfolio investments. We circulated a memo yesterday to provide you with the details of the review and some modest changes we propose for the next investment cycle.

On the basis of the initial feedback we received from the subcommittee and Treasury officials, the Desk recommends reducing the market risk of the euro portfolio by lowering the conditional value at risk, or "cVaR," to 3 percent from 4 percent. The cVaR constraint is used along with the other risk parameters in a standard risk–return optimization exercise to select a target asset allocation for the euro portfolio over the one-year investment horizon.

Given current market conditions and incorporating the recommended parameters, this asset allocation will involve slightly higher holdings of cash, and slightly lower holdings of both shorter- and longer-term securities, relative to the target allocation set last year but would be expected to have a similar return to that expected at the start of the investment cycle last year. The target asset allocation for the euro portfolio is depicted in the blue bars in the bottom-left panel.

With regard to the yen portfolio, the Desk recommends maintaining the current strategy in the upcoming investment period by continuing to place proceeds from securities holdings in a deposit account with the Bank of Japan at a 0 percent rate of

interest. This passive approach is also projected to lead to higher holdings of cash, as shown by the red bars in the bottom-left panel.

The Desk will seek instructions from the Foreign Currency Subcommittee that incorporate the recommended parameters by the end of the month and begin to rebalance to the new target asset allocation for the euro portfolio over the course of October. Please let us or the subcommittee members know if you have any questions or concerns about this proposal.

I turn now to an update on reference rates in the bottom-right panel. At the May FOMC meeting, we briefed you on Federal Reserve efforts to explore the production and publication of three new reference rates that are based on overnight Treasury repo transactions, in cooperation with the Treasury Department's Office of Financial Research. Since that time, the Alternative Reference Rates Committee selected the broadest of these rates, the Secured Overnight Financing Rate, or SOFR, as its recommended alternative to U.S. dollar LIBOR. Additionally, a *Federal Register* notice was issued by the Federal Reserve Board in late August that requested public comment on the planned construction and production of the three new rates. After the 60-day comment period, feedback will be addressed publicly and a final notice will be published. Initial publication of the rates remains on track for the first half of 2018.

I should note that the Alternative Reference Rates Committee's decision and the market's focus on these reference rates took on added prominence in the intermeeting period when the head of the U.K. Financial Conduct Authority, which regulates LIBOR, indicated in a speech that it has had to exert increasing effort to convince LIBOR panel banks to continue to submit quotes, and that it was seeking a voluntary agreement with them to remain on panels through the end of 2021. This has led market participants to believe that LIBOR may end sometime after 2021 and has increased attention to the details of the production of the SOFR and the ARRC's transition plans.

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. Most of the tests performed were successful, including a test TDF operation. The Desk attempted its first-ever securities lending exercise using a backup tool that has been built for resiliency purposes should we have an event in which our proprietary auction system, FedTrade, is unavailable. Due to a technical issue with the new tool, the test was not completed. We will provide advance notification to the Committee when it is rescheduled. I will now turn the briefing back to Simon, who will discuss key operational and communication details should the Committee decide to implement its balance sheet normalization program.

MR. POTTER.<sup>2</sup> Thank you, Lorie. I will now turn to the handout labeled "Material for the Briefing on Reinvestment Operations" to describe how the Desk

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<sup>2</sup> The materials used by Mr. Potter are appended to this transcript (appendix 2).

would implement the caps, should the Committee decide at this meeting to initiate the reinvestment policy set forth in the June 2017 addendum.

The top panel reviews the capping approach that would be implemented beginning in October. The Desk will continue to conduct Treasury security reinvestments in the primary market by placing noncompetitive bids at auctions. The exact procedures for Treasury security rollovers will be detailed in an updated set of public FAQs. The second panel gives some of the key highlights. Actual purchase amounts will correspond almost exactly to the amounts implied by the caps, with deviations caused only by the U.S. Treasury's \$100 minimum bidding increments.

I want to note one detail. A Treasury security with a month-end maturity that occurs on a weekend or holiday will be included in the total maturing funds for the month corresponding with the stated maturity date, not for the subsequent month when the funds are actually received.

Agency MBS reinvestments will continue to take place in the secondary market. Procedures for agency MBS reinvestment purchases will also be detailed in updated FAQs. The third panel gives some of the key points. It is operationally more difficult for the Desk to purchase the precise amount of MBS implied by the monthly capping scheme. There will be variances due to the nature of agency MBS principal paydown reporting and limitations within our individual purchase operations. To date, the Desk has made up for these variances by carrying them over from one monthly period to the next, consistent with the directive to reinvest all principal paydowns. However, with the implementation of monthly caps, the Desk intends not to carry over such variances to a future month. Some operational procedures will be modified to reduce the variance associated with operating in the secondary market, but, as Lorie discussed at the June meeting, we will not be able to reduce the variance produced by the nature of MBS principal paydown reporting.

Given that these variances will no longer be carried over, we wanted to provide additional context on their magnitudes. The first source of variance—due to principal paydown reporting—is a result of differences between estimates of principal payments reported by the mortgage agencies early in the month and actual principal payments we receive. These have a median of \$2 million in absolute value, but because of large outliers, they average about \$20 million in absolute value. The second source of variance—due to FedTrade's minimum \$1 million trading increment—creates differences between the actual amount purchased and the targeted purchase amount for each security. In a worst-case scenario in which reinvestments are across 50 MBS securities in the second half of the monthly reinvestment period, the deviation could be as high as \$50 million in absolute value. This type of deviation will decrease as reinvestment amounts decrease. The variance will be tracked on a monthly basis and reported in the Desk material at each FOMC meeting.

The draft directive shown in the implementation note indicates that small deviations might occur for operational reasons. In addition to the two sources of deviations just discussed, there could also be deviations because of market conditions

affecting MBS purchases or, more generally, operational postponements for both asset classes. The Desk would consult with the Chair and Committee if we anticipate that these deviations would produce a variance significantly outside historical norms.

The relevant dates for these changes to first be implemented are noted in the fourth panel. The first paydown of Treasury principal following the cap implementation would be Tuesday, October 31. The first agency MBS reinvestment calendar announcement following cap implementation would be on Friday, October 13.

On exhibit 2, the fifth panel highlights a proposal to change the communication about the capacity of the ON RRP facility to the public. As outlined in a memo provided to the Committee last week, the Desk currently issues a statement noting its assessment of the amount of Treasury securities available for overnight RRP after each FOMC meeting at which the federal funds target range has been changed. We propose a different approach from now on. The Desk would release a one-time statement and modify the overnight RRP FAQs to note that the Desk's initial determination is that around \$2 trillion is available, and that this amount is expected to decrease gradually as the portfolio of Treasury securities declines. This approach would allow the Desk to make changes to the amount of overnight RRP offered on a regular basis without drawing undue attention to what is a technical adjustment.

These operational details would be announced tomorrow afternoon if the Committee decides to change its reinvestment policy. The sixth panel lists the communications. Exhibit 3 is a Desk statement regarding Treasury and agency reinvestments that would be released at the same time as the FOMC policy statement and the accompanying implementation note. Exhibit 4 is a Desk statement regarding overnight RRP that will be released later in the afternoon. The Desk would also release updated FAQs, which we have with us if you would like to review them. Thank you, Madam Chair, that completes our briefing. We would be happy to take questions.

CHAIR YELLEN. Questions for Simon or Lorie? [No response] No questions on any aspect?

MR. FISCHER. Well done.

CHAIR YELLEN. All right. If there are no questions, then we need a vote to ratify open market operations, those conducted since the July meeting. Do I have a motion to approve?

VICE CHAIRMAN DUDLEY. So moved.

CHAIR YELLEN. All in favor? [Chorus of ayes] Any opposed? [No response] Thank you. Okay. Then we are ready to move along to the presentations on the economic and financial situation, and let me ask David Wilcox to start us off on that.

MR. WILCOX.<sup>3</sup> Thank you, Madam Chair. I'll be referring to the packet titled "Material for the Briefing on the U.S. Outlook." I, too, would like to begin with a few words about Stan Fischer, and in particular how I first became aware of Stan.

Actually, Stan was not in the room on that occasion, but I was introduced to him nonetheless. It happened in the spring semester of 1978. I was a sophomore at Williams College. To this day, I vividly recall a professor named Carl Van Duyne—the epitome of what education at a place like Williams is supposed to be—coming in for the first class session of the semester, sitting on the front of the desk at the head of the classroom, and telling us how excited he was and how lucky we were to be using for this class a brand-new textbook in intermediate macroeconomics. The textbook had been written by two people I previously had no clue about: Rudiger Dornbusch and Stanley Fischer. But the excitement in Carl's voice let me know that this was going to be something really special. Little did I know that, a handful of years later, I would study economics at MIT, with Stan as my thesis adviser. I will always count it as one of the greatest distinctions of my life to be able to call myself a student of Stanley Fischer.

A sad footnote to the story is that Carl died at the age of 36, leaving a wife and young children. The world was deprived too soon of a really talented person. Another interesting footnote, much less sad: This morning, in the course of doing a little Internet searching about Carl, I stumbled across an old paper on exchange market intervention, written by Dale Henderson—at that time a member of the IF Division here at the Board. In the acknowledgments, Dale thanks several people for comments on an earlier draft, including Carl Van Duyne and Janet Yellen. So much for history.

Our medium-term outlook is largely unrevised from July, with real activity continuing to increase modestly faster than potential for the next couple of years before slowing, and inflation remaining below your 2 percent objective for a time but ultimately converging toward it.

In the near term, the quarterly pattern of real GDP growth during the second half of this year will be buffeted by Hurricanes Harvey and Irma—and we hope not by Jose or Maria, though it's too soon to know for sure. I'm sure that Presidents Kaplan and Bostic will have much more to report from the front lines, but let me review our very high level summary of the likely effects of the hurricanes on key indicators.

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<sup>3</sup> The materials used by Mr. Wilcox are appended to this transcript (appendix 3).



The September Tealbook GDP projection, which is shown in panel 1 of your “Forecast Summary” exhibit, only incorporated the estimated effects of Harvey, as Irma had not yet made landfall. Last week we took Irma on board as well, and effects of both hurricanes were reflected in the update that was distributed to you last Friday.

All told, as summarized in line 1 of the panel to the right, we estimate that the hurricanes will reduce real GDP growth in the third quarter by about 1 percentage point at an annual rate. We anticipate a slightly larger boost to GDP growth in the fourth quarter as output returns to its pre-hurricane trajectory and a small portion of lost spending is made up.

The magnitude of these near-term effects is still, of course, highly uncertain, but we have been able to bring to bear more information on the question than ever before. This year, for the first time, we have had access to near real-time data on electronic transactions, and this information has allowed us to get a rough handle on the likely effects on consumer spending. Panel 3 compares the effects on credit and debit card transactions around the time of Harvey and Irma and, for comparison, Sandy. These estimates helped calibrate the hit that we assume will be sustained by consumer spending in the national income accounts.

Separately, we estimate that the two hurricanes taken together will reduce third-quarter IP growth by  $3\frac{3}{4}$  percentage points at an annual rate. This estimate, too, is uncertain, but it does draw on weekly and daily production data for some industries, detailed information on the operating status of refineries and chemical plants—which are particularly concentrated on the Gulf Coast of Texas—and amazingly granular information about the county-level location of production by industry. The IP staff combined the county-level data with FEMA emergency designations and—here’s the cool part—also with the spatial coordinates of individual establishments, which they overlaid with floodplain maps. I also want to gratefully acknowledge the helpful information about the hurricane effects provided by the staff at the Dallas and Atlanta Banks.

As for employment, we expect that the hurricanes will hold down the increase in private payroll employment this month by about 200,000. As a result, and given an underlying monthly pace of job gains that we currently put at about 185,000, our point estimate is that the BLS will report that private payroll employment declined slightly in September. We then expect employment to rebound in October and November. Irma accounts for three-fourths of these employment effects, partly because it made landfall during the reference week for the September establishment survey.

An added uncertainty in all of this, on top of what happened in reality, is the issue of what will be detected by the measurement apparatus of the statistical agencies. We don’t know, for example, how dense their samples are in the storm-affected areas. Furthermore, we don’t know how likely their usual respondents will be to report under extremely difficult circumstances.

Beyond the near term, we expect that spending will return close to its previous underlying baseline. A recovery of lost spending and production, along with some rebuilding of damaged or destroyed property, should add modestly to real activity over the next several years, though the process will be gradual enough that the imprint on our medium-term growth projection in any particular year is small. We also expect to see a noticeable near-term effect on headline inflation. I will return to that effect shortly.

The other information that we received after closing the Tealbook projection—mainly, the retail sales report—was somewhat weaker than we had expected, as can be seen by comparing the top two lines of panel 4. Nonetheless, over the remainder of the medium term, our outlook for real GDP growth is little changed from July. With actual output growth expected to outpace potential—albeit to a diminishing degree—resource utilization tightens further over much of the medium term. By the end of the projection period, real GDP is expected to be 2 percent above its potential level—about unchanged from our July forecast.

We made two small adjustments this round to the supply side of our forecast that I will note only briefly in the interest of time. First, in response to the continued strength in labor force participation this year, we nudged up our estimate of the trend for that series. Separately, we shaved 0.1 percentage point off our assumption for the natural rate of unemployment, bringing it to 4.8 percent. This adjustment aligns relatively well with the general message being received from the models that we maintain to help us gauge the cyclical state of the economy.

Panel 5 plots the current estimated natural rate implied by one such model as the solid blue line—and I apologize, it's rather difficult, at least for my eyes, to detect the difference between blue and black in that panel—together with the model's estimate as of the April Tealbook. The model estimate is the jagged one, and the judgmental staff projection is the very smooth, solid line. As you can see, the model has revised down its estimate of the natural rate since April, the last time we adjusted our judgmental assumption, and the small downward adjustment that we made this round in the judgmental assumption moves us broadly in the same direction.

With a slightly higher level of output relative to potential and a small downward adjustment to the natural rate, the projected path of the unemployment rate—shown in panel 6—is a little lower than what we wrote down in July. At the end of 2020, the unemployment rate is projected to be  $3\frac{3}{4}$  percent, about 1 percentage point below our new estimate of the natural rate. By the end of the medium term, the unemployment rate begins to show the influence of the continued normalization of monetary policy indicated by the policy rule we use. As can just barely be seen from the figure, the projected path for the unemployment rate bottoms out in late 2019 and starts to edge higher in the following year.

Panel 7 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 blacks and Hispanics have improved, on net, since the beginning of this year.

On a related note, last week, the Census Bureau released its annual report on median household income. Some of the key data provided by that report are shown in panel 8. The report contained both evidence that was encouraging about improvements in overall economic well-being and evidence of how deep the differences in economic well-being remain across races and ethnicities.

On the good news side, as shown by the black line labeled “Total,” real median household income for the U.S. population taken together increased 3.2 percent in 2016. Most of the press coverage has slurred perhaps too easily over the methodological break in the series in 2013 and has claimed that the median income reached its highest level on record in 2016, when that probably isn’t quite true. But one can say on a methodologically consistent basis that, cumulatively, real median income at the household level has increased 8½ percent in the past two years. Also encouraging is the fact that the gains were widespread. Indeed, median incomes increased more for black and Hispanic households than for white households.

On the other hand, the fact remains that real median income appears to be little different from its level a decade and a half earlier—symptomatic both of slow productivity growth and the ongoing increase in inequality. There is, in addition, little or no evidence in this report of any longer-term progress in closing the gap in economic circumstances between blacks and whites. Indeed, in 2016, the median household income of black households remained only about 60 percent of the median income of white households.

A complementary study published very recently in the *Proceedings of the National Academy of Sciences* had some deeply sobering related evidence. Specifically, the study concludes that Americans systematically underestimate the degree of inequality in economic circumstances across races and ethnicities, and systematically believe that inequality has diminished in recent decades more than it really has. The authors also report that misperceptions along these lines are most severe among wealthy whites and among those who believe most strongly in a just world, characterized by social fairness and meritocracy.

The next three panels summarize the inflation outlook. In addition to distorting real activity, Harvey and Irma will also twist the near-term inflation data some, mostly by causing a short-lived spike in consumer energy prices. Specifically, we currently estimate that gasoline prices will be about 30 cents a gallon higher this month and 20 cents higher next month than they otherwise would have been. As a result, the 12-month change in total PCE prices—the black line in panel 9—is expected to come in at 1¾ percent this month and about 1.6 percent next month. By the end of the year, however, these energy price effects should have dissipated. Meanwhile, the 12-month change in core PCE prices—the red line—is expected to remain around 1½ percent in coming months.

As you can see from panels 10 and 11, our forecast for headline and core inflation over the medium term is little changed from the July Tealbook. The preliminary September reading on median longer-run expected inflation in the Michigan survey—the red line in panel 12—was 2.6 percent, up 0.1 over August. An interesting development over the past year or so is that the decline in this series—which has been much more noticeable than in any of the other survey-based measures that we track—appears to have slowed or even stopped. This bottoming-out is even more apparent if we consider smoothed versions of the series, including a univariate trend, shown as the blue line in the panel, or a trend derived from a model that tries to control for the influence of food and energy prices, shown as the green line.

Finally, panel 13, shown on your last page, shows four of the various measures of labor compensation that we follow. After fully incorporating BEA’s annual revision to the national accounts, the productivity and costs measure of hourly compensation growth—a smoothed version of which is shown as the blue line—was revised down sharply in 2016. We view last year’s weakness, which is not mirrored by the other compensation measures, as anomalous and are tentatively writing it off as symptomatic of the noise in this series that causes us to put more weight on the ECI—the black line—for the purpose of discerning trends in compensation. Indeed, as measured by the ECI, second-quarter hourly compensation growth was in line with our July Tealbook projection and appears to be behaving about as we would expect in the face of an increasingly tight labor market, low trend inflation, and continued lackluster trend productivity gains. Steve Kamin will continue our report.

MR. KAMIN.<sup>4</sup> Thank you, David. I’ll be referring to the materials titled “Material for the Briefing on the International Outlook.” But before I do that, I want to follow on David’s remarks by thanking Governor and Vice Chairman Fischer for his service to the Federal Reserve. Unlike David, I did not study under Stan while at MIT. However, I did have the privilege of teaching introductory macro under his supervision and using his aforementioned and excellent textbook written with Rudi Dornbusch, which I should say taught me as much economics as it taught my students. A great experience. Fast-forwarding to the present, I’ve had the pleasure of, as they say, “backbenching” Stan at numerous international meetings all over the world connected with the BIS, OECD, G-20, G-7, and IMF. In all of these venues, he has been, as Chair Yellen noted, an extraordinarily effective ambassador for the Fed, drawing on a lifetime of scholarship, practical experience, and close relationships with foreign policymakers to explain our perspective and offer keen insights into global prospects and issues. My colleagues and I in the International Finance Division will greatly miss the worldwide perspective that Stan brings to our table.

With regard to the briefing, incoming data have further reinforced the narrative for the global economy that’s arisen in recent quarters—namely, robust growth with little sign of overheating. First, as has been the case since late last year, foreign growth, shown in panel 1, has come in even stronger than we expected. The second-quarter GDP “print” was ½ percentage point stronger than in the previous Tealbook,

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<sup>4</sup> The materials used by Mr. Kamin are appended to this transcript (appendix 4).

at 3¼ percent. Most prominently, Canada surprised us with blistering real growth of 4½ percent, and in Mexico, which also has a large weight in our aggregate for foreign GDP, growth slowed by less than we had expected. The growth we've seen in recent quarters is the fastest since 2013. In light of the apparent stronger momentum in the global economy, we've boosted our projected growth abroad a bit for the second half of this year to 2¾ percent. But beyond then, we haven't substantially changed our assessment of the fundamental drivers of foreign growth and, accordingly, have not revised our longer-term outlook by much during this forecast round.

Second, much has been said not only of the pickup in global growth, but of its synchronous nature—for the first time in a while, almost all major economies are sharing in the expansion. This can be seen in the Rorschach blot that is panel 2. Along with aggregate foreign growth, the solid line, this panel plots the separate four-quarter growth rates of GDP for the 35 economies we forecast—economies with larger U.S. merchandise export shares, such as Mexico, Canada, or China, are indicated with larger dots. If you squint a bit, you'll see that compared with earlier in the post-crisis period, the dots—especially the larger ones associated with major trading partners—are less dispersed and nearly all positive. If you don't squint, all you'll see is a fuzzy caterpillar.

Third, despite continued solid growth, headline inflation in the advanced foreign economies, panel 3, not only remains well below central bank targets almost everywhere but the United Kingdom, but actually declined over the past several months. This decline, along with that in the United States, has helped reinforce the view held by some observers that the Philips curve is dead or at least quite ill, but we take less signal from these recent developments. Much of the decline in headline inflation abroad is due to recent sharp declines in retail energy prices, the blue line in panel 4. Retail energy prices should bottom out and then move up somewhat, following on the pickup in crude oil prices, the black line, in recent months. Furthermore, core inflation, shown in panel 5, has been holding up better than headline other than in Japan and has even risen a touch in the euro area. All told, with the effects of energy prices expected to wash out and resource slack to diminish, we still anticipate that headline inflation will come back over the forecast period to around the 2 percent target for the Bank of Canada and Bank of England and near that for the ECB, though falling considerably short in Japan.

Still, recent wage data—such as that in the United Kingdom and euro area, shown in panel 6—continue to disappoint, adding to uncertainties about the inflation outlook. Accordingly, we see the pace of tightening at a couple of the major foreign central banks as likely to be a bit slower than we've previously assessed. In the euro area, with the rise in its currency set to put an additional damper on inflation and with the ECB's public communications hinting there is no strong consensus to tighten policy soon, we now assume a somewhat slower tapering of their asset purchases. In Japan, core inflation remains near zero, and we're assuming the Bank of Japan's target for the 10-year yield will remain at around zero through the end of next year. But two other major central banks have signaled they may remove stimulus a bit faster than previously believed. In Canada, surprisingly rapid GDP growth this year

led the Bank of Canada to hike its policy rate twice in the past few months, and we expect another 100 basis points of increases by the end of 2018. Conversely, U.K. growth has been sluggish of late, but unemployment has fallen to 4.3 percent, its lowest level since 1975, and inflation has been boosted to near 3 percent by the post-Brexit decline in the pound. Bank of England officials have signaled concern that diminished slack may add to inflationary pressures, and we now have the Bank of England lifting off in early 2018, a quarter earlier than we forecast in July, and, in fact, a hike later this year is not out of the question either.

To be sure, despite these recent revisions to the outlook, we still think it likely, as do most observers, that monetary policy in all of the major advanced foreign economies will be quite accommodative for some years to come. But this outlook is tenuous because not only is it as difficult, as usual, to predict the normal drivers of monetary policy—output and inflation—but the mapping between those drivers and actual policy is likely to be unusually tenuous.

On your next exhibit, panels 10 through 13 compare our projections for foreign policy rates, the black lines, to interest rates implied by the non-inertial Taylor (1999) rule, the red lines. As you can see, the staff projection for policy rates is generally well below the Taylor (1999) rule, even by the end of the Tealbook forecast period in 2020. Why is this the case? First, foreign policymakers have taken on board both that the long-run  $r^*$  for their economies has declined over the past couple of decades, and also that the short-run  $r^*$  is probably even lower, as indicated in the estimates that are shown in panel 9. In the absence of any way to reliably identify either of these  $r^*$ s, it's difficult to know how loose or tight monetary policy really is. Accordingly, policymakers are likely to proceed cautiously as they feel their way forward until more tangible evidence emerges that economies are moving toward and beyond full capacity. A second and related factor, to which I referred earlier, is that foreign policymakers are growing increasingly concerned about the strength of the Phillips curve relationship and are questioning their ability to identify the slope of that curve or the level of the natural rate of unemployment. So until they see more tangible evidence that tight labor markets are pushing up wages and prices, they are likely to remain very patient about withdrawing stimulus.

The staff forecast for inflation is indeed predicated on the view that the Phillips curve is alive, albeit not necessarily well, and we have inflation at or near 2 percent for most of the advanced foreign economies by the end of the forecast period. If this outlook actually comes to pass, it could alleviate policymakers' concerns that the textbook economic model is broken. As a result, they might reassess their strategies and tighten more rapidly than we've written down in our baseline forecast.

In such a scenario, which is depicted in panel 14 of your last exhibit, central banks in the advanced foreign economies boost their policy rates toward the Taylor rule path more rapidly than they've written down in the baseline. The more rapid tightening lowers U.S. growth a touch, as shown in panel 15. The drag does not come mainly from net exports—additional foreign policy restraint weighs on foreign demand for U.S. exports, but this effect is largely offset by a small decline in the

dollar. Instead, the main effect comes from higher yields abroad that spill over onto U.S. yields, damping U.S. aggregate demand. In consequence, the federal funds rate rises a little slower than in our baseline forecast. I will now pass the presentation over to Michiel De Pooter.

MR. DE POOTER.<sup>5</sup> I'll be referring to the packet labeled "Material for Briefing on the Summary of Economic Projections." To summarize, your projections are broadly similar to those you submitted in June. Many of you see somewhat faster GDP growth this year than in June and a slightly larger undershoot by unemployment in relation to your estimates of its longer-run normal rate in 2018 and 2019. In addition, most of you slightly revised down your forecast for inflation this year, and many of you did so for next year as well. The majority of you project one 25 basis point rate hike during the remainder of this year. Your assessments of the uncertainty and balance of risks surrounding your projections are mostly unchanged.

Exhibit 1 summarizes your economic projections, which are conditional on your individual assessments of appropriate monetary policy. As shown in the top panel, the median of your projections for real GDP growth this year is 2.4 percent, somewhat above your median estimate of its longer-run rate. The median projection gradually declines over the next few years, reaching its longer-run value in 2020.

As shown in the second panel, the median of your projections for the unemployment rate in the fourth quarter of this year is 4.3 percent, below the median projection of its longer-run normal level of 4.6 percent. The median projection for the unemployment rate moves down to 4.1 percent in 2018, where it remains for the following year and then rises slightly in 2020.

As can be seen in the third panel, the median of your projections for headline PCE price inflation rises from 1.6 percent this year to 1.9 percent next year and to 2 percent in 2019 and 2020. In your narratives, some of you indicated that you judged recent weak inflation readings as predominantly the result of transitory factors. However, several expressed concern that some of the factors contributing to the unexpectedly low readings could prove to be more persistent. All of you who commented on the effects of Hurricanes Harvey and Irma indicated that there would likely be some near-term effect on real activity and inflation but little effect on the overall economy in the medium term.

Exhibit 2 compares your current projections with those in the June SEP and in the September Tealbook. As indicated in the top panel, the median of your forecasts for real GDP growth in 2017 is 0.2 percentage point higher than in June, and, as shown in the second panel, the medians of your forecasts for the unemployment rate have edged down for 2018 and 2019. Many of you who revised these projections cited the strength in recent incoming data. Most of you did not assume a fiscal stimulus package, including one participant who previously had assumed some fiscal stimulus.

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<sup>5</sup> The materials used by Mr. De Pooter are appended to this transcript (appendix 5).

Furthermore, the four of you who included some fiscal stimulus either marked down its magnitude or postponed its projected effect.

As can be seen in the fourth panel, the medians of your forecasts for core PCE inflation this year and next are 0.2 percentage point and 0.1 percentage point lower, respectively, as compared with your June forecasts. Most of you indicated that the recent soft readings on inflation were a factor contributing to the revisions in your inflation forecasts. The medians of your projections for real GDP growth and inflation show trajectories similar to those in the September Tealbook. However, the Tealbook continues to project a much more pronounced undershooting of the longer-run normal unemployment rate.

Exhibit 3 provides an overview of your assessments of the appropriate path of the federal funds rate. The median of your projections, indicated by the red horizontal lines in the top panel, stands at 1.38 percent at the end of 2017, consistent with one 25 basis point rate hike during the remainder of this year. One of you projects two further rate hikes this year; four of you project no further rate hikes. After this year, the medians of your projections gradually rise, reaching 2.9 percent in 2020, slightly above the median longer-run projection. Some of you have shifted down your longer-run projection since June, resulting in a 25 basis point reduction in its median value. Six of you mentioned reinvestment policy and indicated that you anticipate a change in reinvestment policy to occur before the end of this year.

The red diamonds in exhibit 3 show the median prescriptions for the federal funds rate using a non-inertial Taylor (1999) rule, given your individual projections for core inflation and the unemployment gap and using your projections for the longer-run federal funds rate as the intercept term. All of you continue to project levels of the federal funds rate for this year and the next that are well below those prescriptions. Compared with the prescriptions that used the June SEP, the median Taylor rule prescriptions for the federal funds rate in 2017 through 2019 have moved lower, most notably in 2017 and 2018. These lower prescriptions reflect the downward revisions to your longer-run projections for the federal funds rate as well as to your projections for core inflation in 2017 and 2018.

Exhibits 4.A through 4.C present fan charts along with your current assessments of the uncertainty and risks surrounding your economic projections for real GDP growth, the unemployment rate, and inflation, respectively. The fan charts show the median projections, the red line, surrounded by confidence intervals derived from historical forecast errors of various private and government projections. As shown in the lower-left panels of exhibits 4.A through 4.C, the distributions of your assessments of the uncertainty attached to your projections were unchanged from June, and a large majority of you continue to view the uncertainty as broadly similar to the average of the past 20 years. In your narratives, a few of you indicated that near-term uncertainty for economic activity and inflation had increased as a result of Hurricanes Harvey and Irma. As illustrated in the lower-right panels of exhibits 4.A and 4.B, your assessment of risks to real GDP growth and unemployment are largely unchanged. In your narratives of the key risks to your projections, some of you



mentioned high equity valuations, reduced risks to the global outlook, or heightened geopolitical tensions. As shown in the lower-right panels in exhibit 4.C, one more of you than in June now assess the risks to inflation as weighted to the downside, and one less of you now assess the risk to inflation as weighted to the upside.

Your final exhibit shows a fan chart pertaining to your median projections for the federal funds rate drawn from historical forecast errors for short-term interest rates. Conditional on the medians of your assessments of the appropriate level of the federal funds rate in coming years and large historical forecast errors, the fan chart implies a 70 percent probability that the level of the federal funds rate will be within a range of 0.9 to 1.9 percent at the end of this year, with the range widening to 0.2 to 5.6 percent in 2020. Thank you. That concludes our prepared remarks. We would be happy to respond to your questions.

CHAIR YELLEN. The floor is open for questions for any of the briefers. President Bullard.

MR. BULLARD. Thank you, Madam Chair. I'm going to refer to the international outlook briefing materials—exhibit 2, panels 10, 11, 12, and 13. These have a Taylor (1999) rule projection of what these foreign economies should be doing with their policy rate versus a staff forecast of what they're actually likely to do.

MR. KAMIN. The “should” is a notional idea.

MR. BULLARD. But you could look at these four, and you could say it looks like the foreign economies are going to go off-track as far as their policy is concerned and, therefore, you're going to get quite a bit of inflation globally. But I didn't hear that in your assessment of what's happened.

MR. KAMIN. Right. My intended argument was, in some sense, the opposite of that, which was that the Taylor rule takes into account the rate of core inflation and the output gap as it's currently estimated, but it does not incorporate considerations of the headwinds that might be temporarily pushing down on  $r^*$ , which was the point of showing some estimates in panel 9. The actual cyclical  $r^*$  could be much less than is incorporated into the Taylor rule. That's one issue.

Another issue is that it does not take into account any temporary or not-so-temporary factors that might be obstructing the transmission channel going from economic growth to slack in the labor market to wages and to inflation. And as long as central bankers are both very concerned about the possibility of headwinds depressing cyclical  $r^*$ , as long as they are also concerned about their inability to identify longer-run  $r^*$ , and as long as they have concerns about how well the transmission channels are operating through the labor markets, that might well stay their hand and lead them to be more patient in raising rates than would be indicated by the rule.

MR. BULLARD. So should we just not use the Taylor (1999) rule as a kind of a benchmark or what our economy should be doing with the policy rate?

MR. KAMIN. Well, in terms of our thinking about it, we wouldn't, and we don't, use that rule in order to assess what the central banks are likely to be doing over the next several quarters because we think these headwinds are operative, and, as a result, central banks will have more accommodative policy. But down the road when we think that, basically, the economies have returned to some version of normality and these short-term headwinds have abated, we think that it might be a decent guide, or at least the best available guide, to where we think the policy rate will go, conditional on our estimate of what the longer-run  $r^*$  is. And that's why, if you look at these panels, in the case of the euro area, Canada, and more or less the United Kingdom, we basically have the policy rate getting up to the neighborhood of those suggestions of the Taylor rule.

MR. BULLARD. I see. So the Taylor rule would be valuable, but only in the medium term after these headwinds have dissipated.

MR. KAMIN. Yes, in this particular situation. I won't say that one should never use the Taylor rule as a guide to short-run policy. But, in these particular circumstances, it seems like it's probably not the best guide.

CHAIR YELLEN. President Kashkari.

MR. KASHKARI. Thank you, Madam Chair. To Steve and to David, for much of this year, we've been looking at low inflation in the United States and trying to assess whether it is transitory, or whether there is some low trend ahead. I'm curious, when you look at the international experience, does it tell you anything about the inflation we're experiencing here? For example, when we point to low cell phone pricing, I don't think anybody would argue that low cell phone pricing in America is affecting global inflation. I'm just curious how you look at the global experience and what it tells you about domestic inflation.

MR. KAMIN. Well, I think the main lesson that we're getting from the foreign experience is that we are not alone in facing the conundrum of diminishing slack with low wage growth and low price growth. In other words, to varying degrees, all of the major advanced economies are wrestling with very similar problems.

In the euro area, wage growth is very subdued, inflation is pretty subdued. They've got a decent excuse. Their unemployment rate is still probably not quite all the way down to equilibrium, but, nevertheless, even in countries in the euro area that have very tight labor markets, like Germany, they haven't seen that much wage growth.

In the United Kingdom, their headline inflation has been kind of artificially boosted by the fall in their exchange rate. But domestic inflation is low and wage growth is low despite, again, super-tight labor markets, by their standards.

So, basically, I guess my reaction would be, if you really wanted to explain the conundrum of low nominal wage growth, low inflation, tight markets, you'd probably want to come up with an explanation that works not just for the United States, but probably for other advanced economies as well.

MR. KASHKARI. Do you have any explanation?

MR. KAMIN. Well, the one that I tend to trot out, in the absence of anything better, is that probably workers throughout the advanced economies have been affected or scarred by a couple of experiences, most recently the Great Recession and financial crisis, which led them to be very anxious about their job security, and probably, over a longer period of time, the advent of China and other emerging market economies, which have basically presented a lot of competition to them. And those factors together in some way might have led to basically more tepid wage demands than you ordinarily see in these circumstances. I can't offer you a lot of concrete evidence to support that.

MR. KASHKARI. Thanks.

MR. WILCOX. Just very briefly: Steve mentioned the recognition that we are not alone in the global economy in having low inflation. We wouldn't have been inclined to write off our low inflation experience anyway, but it makes us even more cautious or hesitant about doing that. I think there are some common explanations. I'm much less familiar with the international data than Steve is, but productivity growth, I believe, is a phenomenon with considerable global effect—lots of economies around the world have been experiencing slow growth of productivity over a protracted period of time. And I think some of the explanations that President Kaplan has been highlighting in his recent interventions also have commonality across many different countries, with technology-enabled disruption and perhaps heightened competition undermining

the pricing power of firms. We don't have a great set of diagnostics or explanations for that. There are some phenomena that seem, at least prima facie anyway, at odds with that, but the commonality, I'd say, is worrisome.

MR. KASHKARI. Thanks.

CHAIR YELLEN. President Mester.

MS. MESTER. Thanks. I have a question on the SEP. I think this is probably the first time in this cycle that in the funds rate path we have overshooting in the median path compared with the long run. I was just wondering whether the staff thinks that that's going to be noticed and whether there will be any reaction about that. Or is it sort of a nonevent that will be washed out with all of the other things that we're going to be talking about?

MR. LAUBACH. So I don't know exactly what, for example, our contacts expect in terms of the longer-run dots.

MR. POTTER. I don't believe they'll be that surprised. There's some commentary around the longer-run estimate. There's a lot of work by various people that they know that we look at, and that's been coming down. I think there were some people who thought that. I don't think people in the market necessarily focus a lot on the 2020 dot relative to the long run. I think the long run probably has more information for market participants than the estimate for 2020, which is about a percentage point or more above the market estimate.

MS. MESTER. Thanks.

CHAIR YELLEN. Other questions? [No response] Okay. Seeing none, I suggest we begin our round. President Bullard.

MR. BULLARD. Thank you, Madam Chair. Eighth District economic conditions have improved at a modest pace since the previous FOMC meeting, but signs of further improvement

have diminished. The pace of District manufacturing activity has slowed, although it remains stronger than one year ago and stronger than for the nation as a whole. Residential real estate activity news has been mixed. Year-to-date sales are about the same as for one year ago, but real estate contacts said sales fell short of expectations for this year. On the inflation front, District business contacts report slower growth in both selling prices and in nonlabor costs. Business contacts remain generally optimistic. District employment growth has slowed in line with the national trend, but the District unemployment rate dropped to 3.9 percent.

Let me turn now to the national outlook and prospects for above-trend real GDP growth in the second half of 2017. In the first half of 2017, we had weak Q1 real GDP growth followed by some bounceback in Q2. That bounceback was not as large as initially anticipated. On average through the first two quarters of 2017, the economy grew at about a 2 percent pace. This was not meaningfully different from the 2 percent pace for all of 2016 or, indeed, for the average pace for the entire period since the end of the recession in 2009. I characterize this as a 2 percent growth regime, significantly slower growth than the post-World War II U.S. average.

As of August 2017, it was perhaps possible to argue that the second half of the current year would be different, and that the economy would grow to a 3 percent pace during this period. However, more recent data, some of it generated by a pre-hurricane economy, suggested that Q3 growth would not be as robust as had been hoped. Many forecasters marked down their projections for Q3. For example, Macroeconomic Advisers' current Q3 forecast is just 1.7 percent real GDP growth at an annual rate.

The uncertain effects of Hurricanes Harvey and Irma add to the fog regarding Q3 and Q4 real GDP estimates, but taking the Macroeconomic Advisers 1.7 percent as a benchmark, the Q4 bounceback would have to be substantial indeed if the economy were to average 3 percent

growth in the second half of 2017. In particular, we'd have to see 4.3 percent growth in Q4. That number could be lowered if all you wanted was 2½ percent growth for the second half of this year. Fourth-quarter growth rates are also obviously complicated by holiday sales dynamics, and we will not get a first glimpse of this number until late January 2018.

I think it is unwise to make U.S. monetary policy by putting a lot of confidence in this type of outcome over the next six months or so. It seems more likely that the Q4 bounce after the two hurricanes will be more muted, so that the average growth rate for the second half of 2017 will again be close to the 2 percent trend, as it has been for some time. In any event, I do not think it is necessary to be preemptive in this matter. With inflation at relatively low levels and inflation expectations too low to be consistent with our 2 percent inflation target, and in view of the difficulties of the current data, we are not in a position that requires a decision.

Concerning inflation, I think the Committee has been too “hawkish” relative to the incoming data during the first half of 2017, and this has contributed to a decline in the 10-year Treasury yield this year. I envision only a modest uptick in inflation during the remainder of 2017. Further adjustment of inflation toward target may occur during 2018, but we can learn about those developments as 2018 progresses.

U.S. labor markets have been performing relatively well, but the improvement has been slowing. The growth rate of nonfarm payroll employment measured from one year earlier has declined to about 1.45 percent, the slowest pace on a sustained basis since 2011. This slowing may be indicative that the job growth will continue to slow. The unemployment rate at 4.4 percent may stabilize in this type of environment.

According to recent econometric estimates, low unemployment has only a very small impact on inflation. The larger impact likely comes from inflation expectations, which, as I have noted, are running at an uncomfortably low level. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Williams.

MR. WILLIAMS. Thank you, Madam Chair. Despite the terrible human tragedy and disruptions caused by the hurricanes, the economic expansion appears to remain on track. Real GDP growth looks to grow nearly  $2\frac{1}{2}$  percent this year, which is toward the higher end of annual increases seen during the expansion. A wide variety of labor market indicators are also flashing green. Notably, employment gains averaged 185,000 jobs over the past three months, well above the pace needed to keep up with labor force growth. In view of the solid momentum along with its still accommodative stance of monetary policy, I expect the economy to overshoot potential further and by a significant degree, with the unemployment rate dipping a touch below 4 percent in the second half of next year.

That said, my projection of real GDP growth is less optimistic than that in the Tealbook by about  $\frac{1}{2}$  percentage point in 2018 and in 2019, despite an assumed path for the funds rate that's far less steep. Specifically, I expect GDP growth to slow to  $1\frac{3}{4}$  percent next year and then drift down to a little below  $1\frac{1}{2}$  percent in 2019. And I assume one more rate increase this year and three in 2018, with the funds rate finally reaching  $2\frac{1}{2}$  percent in 2019, which is my estimate of neutral.

My relative lack of optimism about economic growth stems from three key considerations. First, I no longer expect substantive fiscal stimulus to take place in the next few years. Events this year have shown how difficult it will be to pass new significant tax or



spending legislation, and although one never can be sure, I now see the possibility of a major tax cut as a risk to the forecast rather than the most likely outcome.

Second, I don't see the recent improvement in financial conditions, including lower long-term rates, higher equity and real estate prices, tightening credit premiums, and the decline in the value of the dollar, as necessarily signaling strong growth. As I noted in our previous meeting, there were two competing narratives regarding the interpretation of the connection between financial conditions and the economy. One view is that the recent easing of financial conditions provides significant impetus to growth through wealth effects, lower cost of capital, and so on. This is a perspective adopted in the Tealbook, with, for example, household wealth gains offered as support for higher consumer spending. My sympathy is for the alternative view in which this apparent improvement in financial conditions mainly reflects perceptions of lower  $r^*$ . Specifically, a falling natural rate of interest will push down longer-term interest rates and push up asset prices as the discount rate declines. For example, price-to-earnings ratios that look excessive with a 2 percent  $r^*$  are much more reasonable with  $r^*$  close to zero.

Third, the steady-as-she-goes forecast is backed up by the hard data on consumer spending and demand for credit as well as anecdotal reports. In particular, despite the improvement in asset valuations, we don't see a surge of C&I loans or nonmortgage consumer financing. For example, home equity balances are still being paid down. My business contacts confirm this interpretation, emphasizing how little impact low long-term rates have had on credit demand or business spending.

In summary, I expect economic growth to slow as monetary policy normalizes without a sizable boost coming from either fiscal policy or what might appear to be very favorable financial conditions.

With regard to inflation, I feel the agony of Sisyphus as core inflation rolled back down the hill after being so close to our 2 percent goal earlier this year. My staff has been busy digging into the sources for the recent shortfall inflation, and they did some analysis where they divided the components of core PCE inflation into two groups: an acyclical group and a pro-cyclical group.

The pro-cyclical inflation reflects categories that historically have tended to be sensitive to the aggregate demand and economy-wide slack, consistent with the Phillips curve. In contrast, the acyclical group consists of categories for which inflation was largely driven by sector-specific supply-side factors that are not as highly connected to the business cycle. The striking finding is that the procyclical inflation fell a lot during the recession—that's not surprising—but it also has come back up to about to pre-recession levels, while the acyclical inflation is still very low. Put another way: The low core inflation that we're seeing recently is not due to a breakdown in the Phillips curve relationship between slack and inflation, but rather, stems from some downward shocks in price categories that are typically not that sensitive to slack.

Some of the weakness in acyclical inflation is due to large price drops in specific volatile categories we talked about a lot here: pharmaceuticals, airfares, cellular communications, and education services. But historical experience suggests that these are unlikely to have persistent effects on inflation. This analysis, however, also highlighted that the one key factor accounting for the missing inflation has been lower cost for health-care services—the most important acyclical component. Mandated cuts to Medicare payment growth, which are mirrored in slower private payment growth, have kept increases in health-care services prices unusually low for several years. These legislative changes are essentially a persistent supply shock that's holding

down inflation several tenths of a percentage point despite a strengthening economy. Given the administrative process underlying these payments, I expect these effects on inflation to diminish only gradually over time.

Because of this analysis, I am comfortable with the economy running somewhat beyond potential for some time in order to reach our overall inflation target, as is the case in my projection. Getting inflation back to 2 percent will likely require pushing pro-cyclical inflation fairly high in order to offset the low rate of price increase in sectors such as health-care services.

Given the prospect of sustained very low unemployment, I project inflation will move gradually back to our 2 percent goal by the middle of 2019 and, in fact, have a modest overshoot in 2020. I view the risks to this forecast as balanced. On the upside, there is the risk that such an extended period of very tight labor markets may foster a more rapid increase in inflation. But, on the downside, the acyclical factors, such as muted increases in health-care services prices, could continue to hold down overall inflation longer than I currently anticipate. For the record, I'm SEP respondent number 16. Thank you.

CHAIR YELLEN. Thank you. President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. The Tealbook suggests that we will finish this year with the unemployment rate at 4.2 percent and the PCE inflation rate at 1½ percent. Compared with our forecasts two years ago in the September 2015 SEP, what has surprised us? In September 2015, FOMC participants projected a median unemployment rate at the end of 2017 of 4.8 percent and PCE inflation at 1.9 percent. If the Tealbook forecast for year-end 2017 turns out to be accurate, we will have overpredicted inflation by 0.4 percentage point and overpredicted the unemployment rate by 0.6 percentage point. If we had known at that time that the unemployment rate would be headed toward 4.2 percent instead of the 4.8 we

expected, we would almost surely have raised our prediction for both the inflation rate and the appropriate federal funds rate. But had we also known that inflation would remain significantly below 2 percent, it would not have been nearly as clear that a higher federal funds rate would be required; hence our current dilemma. It is important to point out that our 2015 forecast for year-end inflation did not go astray until fairly recently. Six months ago, the median PCE inflation forecast by FOMC participants for this year was still at 1.9 percent. But at that time, the unemployment rate forecast had already been revised down to 4½ percent.

How should we weigh developments in the two elements of the dual mandate? I am concerned about the risk of overreacting to a fairly recent and possibly temporary development: the surprisingly low readings on inflation. In contrast, the evolution of unemployment has been consistent throughout and is likely to continue its march down to 4 percent or below. There is no argument about a temporary phenomenon in the case of unemployment.

I am also worried that incoming data will not help clarify the underlying trends in unemployment and inflation over the next two months. For the next several months, it will be particularly difficult to distinguish the signal from the noise as a result of Hurricanes Harvey and Irma. The interpretation of high-frequency incoming data in the near term will be particularly problematic for inflation, output, and unemployment, depending importantly on how well we are able to distinguish the rebound in activity and the rebuilding effort from any ongoing momentum in economic activity.

This problem with interpreting high-frequency data in the wake of recent storms makes it all the more important to distinguish between misses that have been persistent and continuous compared with the misses that may simply reflect the noise in the recent data. Without the storms, the current low core and total inflation numbers have been expected to bounce back next

year in both the Tealbook and my own forecast. My forecast also expects GDP growth to exceed potential over the next several quarters, producing continued tightening in labor markets. This will, in turn, contribute to a return of inflation toward our target, as inflation expectations remain well anchored. But now we'll have to sift through an inflation bounceback that comes from temporary storm phenomena versus a resumption of the upward trend in inflation.

The Tealbook has also lowered its estimate of the natural rate of unemployment 0.2 percentage point over the past two meetings to 4.8 percent. Perhaps the staff has been reluctant to be too responsive to inflation misses because of the historical tendency to move the natural rate much too closely with the actual unemployment rate. I share that reluctance. In fact, a look at the SEP estimates of the longer-run unemployment rate indicates that those estimates have moved much more than the movement of estimates made with the benefit of hindsight, such as the CBO's estimate of the natural rate of unemployment.

As recently as 2012, the SEP midpoint estimate of the longer-run unemployment rate was 5.6 percent, with a range from 5 to 6.3 percent. The SEP estimates of the natural rate have tended to be much higher than the eventual CBO estimates during periods of high unemployment and much lower than the eventual CBO estimate during periods of low unemployment. As a result, I am reluctant to assume that recent shortfalls of inflation below expectations require a downward adjustment to my estimate of the natural rate, particularly when we have only recently fallen below our most recent median estimate of the natural rate. Hence, my natural rate estimate has remained at 4.7 percent for some time. According to that estimate, it has only been a few months since we have dipped below the natural rate.

Furthermore, there can be lags in the response of inflation to a growing unemployment gap. For both of these reasons, allowing further declines in the unemployment rate seems quite

risky to me. I am reluctant to assume that we can fall as far below the natural rate estimate as implied by the Tealbook forecast without running into serious trouble in the form of either inflation or financial market imbalances.

To conclude, the low inflation numbers are recent, and most private forecasters expect them to be temporary, with inflation returning to target over the next two years. The misses on the unemployment rate, however, appear to be neither recent nor temporary. Most forecasters have the unemployment rate falling further below my and most others' estimates of the natural rate of unemployment. Such a path implies a significant risk that we will watch the partygoers go refill the punch bowl at a time when we should be taking it away. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Mester.

MS. MESTER. Thank you, Madam Chair. Data and reports received from business contacts indicate that business activity in the Fourth District continues to expand at a moderate pace. The September reading of the Federal Reserve Bank of Cleveland staff diffusion index—measuring the percentage of business contacts reporting better versus worse conditions—was 27, essentially unchanged from the readings at our previous two meetings.

Concerns expressed by District contacts about fiscal policy uncertainty seem to have subsided since the time of our previous meeting. A couple of directors cited the recent data breach at Equifax as having the potential to reduce consumer and business confidence. The contacts reported no change in their investment plans.

District labor market conditions remain strong, with year-over-year growth in payrolls averaging 1 percent over the past three months—which is above trend for the Fourth District—and the unemployment rate is averaging about 5¼ percent.

Contacts have been reporting tight labor markets for a while, but this time there seems to have been a change in tone and indications that tightness is accelerating. In fact, the Cleveland Federal Reserve staff's hiring diffusion index reached its highest level in three years. Several construction contacts reported that they would hire more workers if they could find them, while one staffing services contact reported that for the first time in 55 years, his firm had more job orders than it had employees to fill them.

Earlier in the expansion when firms reported having trouble finding workers, they didn't seem to be responding by increasing wages. Now that has changed. Several contacts reported that there's increasing competition for their workers—both lower-skill and higher-skill workers—and that they're responding with significant increases in wages in order to retain them. A director affiliated with an IT services firm reported a considerable rise in turnover among the firm's lower-wage workers. This has led the firm to increase wages a sizable \$2 to \$3 an hour. He reported a similar story with regard to janitorial staff at a regional airport on whose board he serves. A director affiliated with national health-care services and products supplier reported upward pressure on the wages of warehouse workers.

In contrast, price pressures in the District are little changed from our previous meeting. Contacts expect moderate increases in prices over the next 12 months, consistent with what they've been reporting for quite some time. However, in the near term, there could be some upward pressure on prices in the aftermath of the hurricanes. Chemical and plastic producers in the District expect the hurricanes to disrupt shipments of resins, which could lead to short-run increases in prices. Trucking and construction industry contacts expect some upward pressure on materials, prices, and wages as resources are diverted to rebuilding efforts in the hurricane-affected areas.

Two industries with significant presence in the Fourth District, autos and insurance, will also see some effect coming from the hurricanes. Several large insurance companies are headquartered in the District. Their exposures to Texas and Florida are mainly through auto-related business, and they do not appear to be significant at less than 10 percent of their total premium pool. Auto insurance contacts expect a boost in sales in the fourth quarter as vehicles destroyed by the storms are replaced.

I now turn to the national economy. The recent hurricanes have caused loss of life, considerable property damage, and disruptions in economic activity in Texas and Florida. Rebuilding efforts have already begun. The effects are beginning to show up in some of the monthly economic indicators, such as retail sales and industrial production, and this will continue in the near term. As a result of the storms, I expect that economic growth will be depressed in the third quarter and boosted somewhat over the subsequent couple of quarters. While the Tealbook has most of the bounceback occurring in the fourth quarter, I believe it may be more spread out. Some measures of inflation will be affected in the short run as well, as the prices of gasoline and other materials related to rebuilding efforts increase and then decrease as supply is brought back online and demand normalizes.

I don't underestimate the devastation the hurricanes caused for the people in the affected areas. Cleanup and rebuilding efforts will take fortitude and perseverance as this hard work proceeds. One help is that the underlying fundamentals supporting the economy remain sound. These fundamentals include accommodative monetary policy and financial conditions, a stronger U.S. banking system, improved household balance sheets and income growth, continued strength in the U.S. labor market, and improving conditions in the economies of our trading partners.



We are still toward the beginning of the hurricane season, so there may be more to come. At an aggregate level, similar to past natural disasters, I anticipate that the hurricanes we've experienced so far will have little effect on the outlook for the economy over the medium run, which is the time horizon over which monetary policy operates.

Apart from the effects of the hurricanes, the incoming information on the national economy has been consistent with moderate economic growth at 2 percent or better, a strong labor market, and stable inflation, albeit at a level somewhat below our longer-run objective. The revision to second-quarter real GDP pulled up growth for the first half to 2.1 percent, close to my estimate of growth over the longer run. In recent months, smoothing through month-to-month fluctuations, consumer spending has continued to grow at a moderate pace. Growth in business investment has strengthened from last year's tepid pace, and with the exception of autos, production and manufacturing has been expanding at a healthy rate.

Labor market conditions remain strong, with payroll growth well above trend and the unemployment rate below estimates of its longer-run level. The acceleration in wages since 2013 has been relatively subdued, but anecdotal evidence indicates we may be beginning to see a pickup in wage growth. These increases could eventually find their way into the aggregate compensation measures. But, unless productivity growth picks up, I wouldn't expect to see a strong acceleration in wages.

My assessment is that from the standpoint of the cyclical conditions that monetary policy can address, we've achieved the maximum employment part of our mandate. At the same time, there are some longer-run structural issues in the labor market that cannot be addressed by monetary policy but that the country must tackle. Technological advances and globalization are changing the nature of available jobs and the skill sets needed to perform those jobs. While the

overall economy will eventually benefit from these forces, many individuals and some regions are adversely affected by these structural trends.

Another trend we have seen is a rise in opioid addiction and overdose deaths. The Cleveland staff has been undertaking some research on possible connections between the opioid crisis and the labor market. As you know, this crisis is national in scope. The CDC estimates that about 64,000 Americans died of drug overdoses in 2016. Especially affected are white males aged 25 to 54, with a death rate due to overdoses that has recently surpassed that of traffic deaths and that of suicides. The crisis has loomed large, particularly in the Fourth District. Both demand and supply of these drugs have increased. Prescription opioids are a gateway drug for heroin, which is now more accessible and less expensive than prescription opioids. In addition, synthetic opioids like fentanyl are now available, and these drugs are more addictive and more deadly. As you might imagine, assessing the direction of causation between drug use and labor market outcomes is difficult. Preliminary results of the Cleveland Federal Reserve staff analysis suggest that cyclical unemployment has not been a causal factor in the increase in drug use. However, this does not rule out secular changes in labor markets, like those associated with technological change in globalization, being a factor. My staff has also found preliminary evidence that drug use is depressing labor market participation. More analysis will be needed to come to more definitive conclusions.

Inflation remains below our target of 2 percent. In assessing the underlying trend, we'll need to look through temporary movements in the numbers, both those above and those below our goal. I expect some of the near-term inflation readings will be elevated by hurricane effects. The depreciation of the dollar should put upward pressure on import prices, which will show through over time into aggregate inflation measures. Unless the dollar continues to depreciate,

these will pass through over time, just as the downward readings due to the dollar appreciation from mid-2014 through 2016 passed through.

Earlier in the year we saw some soft inflation readings due to the drop in prices of prescription drugs and cell phone service plans. I don't view any of these as significant for the underlying trend. The shortfall below our target does not signal a general downward trend in consumer prices arising from weak demand.

To assess whether there's been a decline in the long-run inflation trend in the recent period, the Federal Reserve Bank of Cleveland staff estimated the time-varying parameter vector autoregression model, with stochastic volatility over the post-1959 period. This estimation indicates that the underlying trend inflation rate fell from about 2 percent in 2006 to about 1.85 percent in 2009 after the policy rate had hit the lower bound, and it has remained at about that level since then. This is consistent with a slight downward pressure on expected inflation seen in nonlinear structural models when the interest rate hits the lower bound and then has moderated as inflation rates rise. The results suggest that it is premature to conclude that the recent softness in the inflation measures is indicating a drop in trend.

Of course, regardless of the source, an underrun of our inflation goal could eventually lead to a drop in trend inflation were it to undermine the public's expectations about future inflation. If inflation expectations were to become unanchored and began steadily declining, it would be much more difficult to raise inflation back to our goal. But we're not seeing that. Both market and survey measures of inflation expectations have remained reasonably stable this year.

I've made little change to my SEP submission since the submission in June, and I view the risks associated with my forecast as balanced. I continue to expect real GDP growth over the

forecast horizon to be somewhat above trend, which I estimate at 2 percent. This is sufficient to keep the unemployment rate below its longer-run level, which I estimate at  $4\frac{3}{4}$  percent.

Conditional on remaining on our path of gradually removing policy accommodation and looking through the monthly variation of the data, my current assessment is that inflation will remain below our goal for somewhat longer, but that the conditions remain in place for inflation gradually returning to our symmetric goal of 2 percent on a sustained basis. These conditions include economic growth, which I expect to be at or slightly above trend, continued strength in the labor market, and reasonably stable inflation expectations.

Softer readings on inflation in the spring and summer suggest it may take slightly longer to achieve a sustained return to 2 percent inflation. I now expect this goal to be met in the first half of 2019 compared with the end of 2018 in my June projections. I've also incorporated a slightly more shallow funds rate path next year compared with my June projections, but I view this as a minor adjustment in response to incoming data, rather than a material change. In my view, the strategy of gradually removing policy accommodation remains appropriate.

As a final comment, usually one doesn't want to be accused of piling on, but in this case, I certainly do, and I would like to acknowledge the great honor I've had of working with Governor Stan Fischer. I didn't have the privilege, as David Wilcox had, of being a graduate student of Stan's, or, as Steve Kamin had, of teaching a course under Stan. But I have learned a lot from him, and I'm going to miss learning from his keen insights on monetary policy, financial stability, and FOMC communications, which are always well reasoned, well articulated, with grace and dignity, and often with a dash of humor thrown in for good measure. I really wish you well, Stan. Thank you for all of your support. And thank you, Madam Chair.

CHAIR YELLEN. Thank you.

MR. FISCHER. I asked the Chair for permission to ask you a question about wages, but I also want to say thanks to you and David and Steve and others for the kind things they have said. I think we're going to have another day tomorrow, aren't we? So maybe you can save them for the end.

I will report that it is often said of textbooks, or any books, that the second or third edition is the best. After that you get tired of revising. David Wilcox was the leading figure in checking the revision of the second edition. I think, as a historical matter, it may have been the best-selling edition. Thank you very much, David. [Laughter]

MR. WILCOX. Can I collect my royalty check at the end of the meeting?

MR. FISCHER. I think you got paid, didn't you? [Laughter]

MR. WILCOX. I have sort of forgotten.

MR. FISCHER. President Mester, what I wanted to ask was a question about wages. You talked at the beginning about wages, saying that employers are beginning to say different things, and some of them are raising their wages. Then you talked about wages again later. Does any of this show up in the macrodata for your District?

MS. MESTER. It's starting to show up, but it's not showing up well in the data. So, again, it's nascent. It's showing up, but it's not something that I would say is widespread. But I think we have to wait and see.

MR. FISCHER. Okay. Thanks.

CHAIR YELLEN. Okay. Thank you. Acting President Mullinix.

MR. MULLINIX. Thank you, Madam Chair. The main economic indicators that we have received since the previous projection were mostly well aligned with expectations. If anything, real activity turned out to be somewhat stronger than expected, and, conditional on that

strength, inflation continues to be surprisingly weak. Accordingly, my SEP submission has changed very little. I continue to see real GDP growth being slightly above its trend rate next year and near trend in 2019, and I attribute the weakness in inflation to temporary factors whose effects will diminish over the next year. Of course, Hurricanes Harvey and Irma have caused considerable damage and suffering in the affected communities, yet the overall effect on national economic activity is likely to be limited and temporary.

Despite the economy's mixed performance in the first quarter, we have seen a definite improvement since then. GDP growth has picked up, supported by solid consumption growth and a rebound of business fixed investment growth. And the labor market continues to surprise on the upside, with the unemployment rate declining more and the labor force participation rate stabilizing at a higher level than what was expected a year ago.

In the face of a strong—even tight—labor market, the weakness in inflation and moderate wage gains are surprising and represent somewhat of a puzzle. For its part, the staff has kept the puzzle manageable in part by lowering the natural rate of unemployment and raising the trend path for labor force participation. Nonetheless, the information we received from Fifth District contacts suggests more pressure on resource utilization. First, I would note that our diffusion index for service-sector wages has steadily increased over the past year and is now near a record high.

Second, anecdotal complaints about labor shortages have become much more intense over the summer. Here are a few examples. An executive with a West Virginia trucking company currently has 80 trucks and would like to hire up to 100 new drivers but cannot find them despite paying \$70,000 per year and offering a \$5,000 signing bonus. His firm's construction division is currently paying \$25 per hour but expects to raise that to a \$30 to

\$35 range in the next year to support continued growth. The owner of a staffing firm in West Virginia reported that placements had declined recently because it just can't find the workers to place. A North Carolina staffing firm reported that one of its manufacturing clients was offering a \$500 signing bonus for temporary workers—the first time they have seen that happen—along with another \$500 bonus for staying 90 days. This was in addition to a \$500 referral bonus for any employee who was brought in and who stayed for 90 days. An engineering and construction firm in Maryland commented, “There is very strong demand for our services. Most contractors are busy, so the competition has decreased considerably. We have been able to raise our prices, and we are still getting work.” Then, finally, a manufacturer in South Carolina said, and I quote, “We are at full employment, and we have about 5 percent that are employed that should be unemployed, because they bring no skills to the job and they move in and out of the wind.”

Governor Fischer, I would say that these comments have intensified, much as they have in the Fourth District. We're not seeing it come through in price changes at the firm level, but we're keeping a close eye on that. In view of these reports, I am inclined to attribute the soft readings on inflation, less to any remaining slack in the labor market, than to transitory factors. The August CPI report is part of the “why.” And while we can't be certain that the soft patch is behind us, my SEP submission is aligned with the Tealbook, with inflation for the remainder of the year close to 2 percent. I continue to expect headline and core inflation to come in at 1.9 percent in 2018 and 2 percent in 2019. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Bostic.

MR. BOSTIC. Thank you, Madam Chair, and good afternoon, everyone. In the weeks before Hurricanes Harvey and Irma, signals about the state of the Sixth District economy were, on balance, positive. Businesses continued to see the economy progressing on a moderate

growth track, and the incoming data on the real side of the economy were signaling a bit more latent strength in demand than I had previously expected.

Despite the combined severity of the storms, I remain optimistic. As reports on the aftermath began to hit my desk, I was struck by the apparent economic resiliency of the region. My staff put out a special question in one of its monthly surveys of Southeast firms regarding the potential disruption to business and sales activity due to the hurricanes. While we did see a moderate increase in nonresponses, mostly from firms in Florida, the majority of respondents reported little to moderate disruption in activity. Firms that saw severe disruption were limited to coastal Florida and Georgia. Perhaps more importantly, more than two-thirds of firms expect operations and sales activity to return to normal within three months or less, while less than 10 percent expect the process to take longer than six months.

This resiliency stands in stark contrast to the attenuated recovery process we witnessed after Hurricane Katrina. One factor in what appears to be the ability of firms and households to bounce back quickly may be the swift, coordinated response across all levels of government and in partnership with regional utility companies. The General Services Administration relaxed certain contracting rules to expedite insurance claims and speed local awards. We also heard reports of state and local governments relaxing or suspending rules to remove downed trees and other vegetation more swiftly and to increase the number of people allowed to repair electrical damage and get power turned back on to homes damaged by flooding. There was also a swift and coordinated response among utility companies. According to a director who runs a large public utility, roughly 60,000 utility workers representing 49 states and Canada have already been deployed to the region in an effort to restore power to the nearly 8 million customers suffering from electrical outages.



One notable concern we heard throughout the District relates to the spike in demand for workers in construction trades that will follow as the rebuilding and recovery processes for both Harvey and Irma kick in. As members of this Committee have been reporting for some time, construction is one of the sectors in which labor shortages have been most acute. These labor market pressures will almost certainly be exacerbated by reconstruction efforts.

Interestingly, concerns about shortages go well beyond the hurricane-affected parts of the Sixth District. The expectation is that skilled labor will be attracted to Florida and Texas as a result of the premium pay associated with private and public insurance funds made available for recovery efforts in storm-affected areas. As a consequence, our contacts in, for example, Alabama and Louisiana anticipate that an already tight market for construction labor will become even tighter.

Overall, our own internal estimates of the aggregate output effects due to Harvey and Irma combined are similar to what is marked in the Tealbook. In particular, I anticipate a negative third-order effect—perhaps  $\frac{1}{2}$  to 1 percentage point in GDP growth—which will largely be recovered over the next quarter or two. Abstracting from the quarter-to-quarter oscillations due to these storms, I have marked up my second-half real GDP growth projections on the basis of the strength of pre-hurricanes data, and I see the economy unfolding at a modestly above-trend pace over the next couple of years.

I still view the risks to my growth outlook as roughly balanced. I will note, however, that we are picking up some hints of weakening in the commercial real estate sector. A District survey of brokers and builders revealed that industry backlogs, which are usually near  $1\frac{1}{2}$  years, have fallen to less than a year. As some of our financial stability concerns have been focused on CRE, though, maybe I should put this in the “mixed blessing” category.

On the labor front, aside from highly skilled and specialty workers, contacts continue to expect modest wage growth consistent with what we have seen in the national numbers. I continue to see little evidence of mounting price pressures. The latest core CPI inflation reading was elevated in part by the reversal of some unusually large recent declines in the lodging away from home, and some apparel, categories. That gives me a bit more comfort that the recent retail price statistics have been buffeted by a series of idiosyncratic shocks. But it is still the case that inflation has underperformed our price objective for the past several years. And I will note that the earlier conversation that was had between Steve Kamin and President Kashkari just notes that this inflation weakness is an international phenomenon and not something that is limited to the United States.

In thinking about this, I have taken seriously some of the alternative explanations for what underlies these continued weak numbers, and we have been having some vigorous debates in Atlanta about a number of the theories. I must confess, though, that I have not found one argument, or even a combination of potential explanations, to be fully satisfying.

The first two explanations are secular changes, which President Kaplan has referred to repeatedly over the past few months. One of these is that technology advances have yielded ever-lower costs of production. And another candidate is the ever-increasing competitive pressures that have kept a lid on prices. I think that “the book is just being written” on the effects of these developments, but I have some initial skepticism. Productivity growth, which is the tracer, if you will, for technology, has been exceptionally weak for most of the recovery. There are almost certainly measurement issues associated with times when technology is evolving rapidly. But it is not clear to me that the measurement issue is large enough to resolve the puzzle of the past five years or so. More importantly, if productivity growth is understated,

then inflation is actually overstated. In that case, the shortfall of inflation below the FOMC's objective is even worse than the data indicate.

So, what about increased competition as a cause of low inflation? This explanation certainly has some appeal. All we have to do is think of China or Amazon. But here, too, I have some skepticism. If competitive pressures are the cause of ongoing low inflation, then we would expect to see, on average, persistently falling profit margins. I don't think the facts align with a story that fundamentally relies on an ongoing profit squeeze over the past five years.

There are several other explanations for the shortfall that I have not definitively eliminated. The first was alluded to earlier today, which is a psychological issue in the response to the Great Recession. I am reminded of the cautious responses by the generation that lived through the Great Depression. We may be seeing something quite similar to that.

Other explanations are more standard. There may be more slack in the economy than I have currently expected or modeled, or inflation expectations could be anchored at a level below 2 percent. Either of these explanations leads me to the same place, which I will discuss a little more tomorrow.

I will just say that the health-care services explanation for low inflation offered by President Williams is quite interesting and is something that we will add to our debates that we have over the next few weeks. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. I suggest we take a break at this point and maybe spend 20 minutes or so. I think coffee is available.

[Coffee break]

CHAIR YELLEN. Okay. Let us resume. Governor Powell.

MR. POWELL. Thank you, Madam Chair. The incoming data continue to show an economy expanding at a moderate but above-trend pace, with job growth easily strong enough to drive measures of unemployment lower. Despite rising resource utilization, there is little evidence that wage pressures are building this year or that inflation is moving up to our 2 percent objective. But with supportive financial conditions still in place, the recent data leave my overall narrative for the economy little changed from the previous SEP—in fact, little changed from a year ago, although I am now a bit less confident that inflation is moving up.

Real GDP growth averaged 2.3 percent in the first half, and I expect it to continue broadly on that path, with a strengthening in business investment and a swing in the contribution of net exports from being a moderate drag to being a modestly positive factor this year. I expect similar outcomes over the rest of this year, as the recent performance seems to be based on solid fundamentals. The staff's estimate of the effects of the twin hurricanes, Harvey and Irma, has been evolving, as is appropriate. The estimate now is that the hit to Q3 growth will be in the range of 1 full percentage point, but that growth will snap back by fourth quarter. That sounds right, although it does seem to me that there is some risk that the full snapback may extend over another quarter or two.

Above-trend growth continues to tighten labor market conditions, with a falling unemployment rate and a rising demographically adjusted labor force participation rate. Since October 2013, the participation rate has oscillated around 62.8 percent as the estimated 0.2 percentage point annual decline arising from aging has been offset by rising prime-age participation. Prime-age participation has recovered to 81 percent, still 1 percentage point below its level in 2007, which suggests there may still be some room for further recovery there. I do expect participation to continue to move sideways for a while longer as the healthy job market

continues to draw in more workers and more of the recession-induced labor market scarring is healed. Even with this increase in participation relative to trend, I see the unemployment rate reaching the low 4s by the end of this year and into the high 3s next year and remaining there for some time, materially below common estimates of the natural rate, including my own estimate of 4.5 percent.

A tightening labor market should mean a gradual acceleration in wages and prices. So far, that is not in the data, with most measures of nominal wage growth showing no signs of acceleration over the past year. And while 2½ percent wage growth is in keeping with the underlying fundamentals of inflation and very low productivity growth, the lack of acceleration in wages is surprising if, in fact, we are at or below the natural rate. This brings me to the unexpected weakness in inflation, for which there is not yet a clear or satisfactory explanation. After running close to 2 percent for 2016, core PCE prices increased only 1.4 percent over the 12 months ending in July, and it may be that we will not see a material increase from that level until well into 2018.

There are several plausible explanations, as has been well covered around the table. First, transient factors may be pushing down aggregate inflation just as transient factors pushed it up last year. And, like it sounds many around the table have done, I have studied this evidence carefully, hoping to find a clear answer there, but I find the evidence to be ambiguous. So we'll have to wait and see. Second, it may be either that there is more domestic slack, as I mentioned with respect to the labor market, or perhaps that in some sense global slack somehow overhangs wage- and price-setting in the United States and other advanced economies, as I think Steve Kamin was suggesting earlier. Third, the Phillips curve may be even flatter than we think.

Finally, and most troubling, it may be that underlying trend inflation and inflation expectations have moved down after years of inflation below the 2 percent objective. Looking across various estimates of inflation expectations received from surveys and markets, I see mixed evidence on this. Conditional on achieving something like the Tealbook forecast for real activity, which is to say, three consecutive years in 2018, 2019, and 2020 of unemployment below 4 percent, I continue to think that the inflation shortfall should disappear over that time. If that doesn't do it, then it's hard to know what would. Of course, we don't know that. And, of course, if trend has declined, that would have significant implications for the conduct of policy. For now, in my view, we have the flexibility to be patient, and there is a strong case for continuing to do so.

And, Madam Chair, I will close by joining others in thanking Stan Fischer for the privilege, and also the pleasure, of being his colleague for these years. Thank you, Stan.

MR. FISCHER. Thank you, Jay.

CHAIR YELLEN. And let me turn things over to Governor Fischer.

MR. FISCHER. Thank you, Madam Chair. A week ago, I took part in a meeting of Working Party 3 of the OECD, whose membership consists essentially of the countries that make up the G-10, which is a group of at least 11 countries plus the EU and ECB and a few other organizations. The members of the group are the deputy governors and directors general of the finance ministries of the advanced western economies, of which Japan is a member, plus senior officials of the organizations of whom the representatives of the ECB and the EU are the most prominent.

My first WP3 meeting was in September 2014, so this was my 13th such meeting. The atmosphere at this meeting was by far the most optimistic of those I have attended in my current

role. The United States was represented by the newly inducted Under Secretary of the Treasury for International Affairs, David Malpass, and by Governor Powell. Their presentations were quite similar to the presentation by Governor Powell we have just heard. [Laughter] Well, we want constancy, don't we? The Japanese economy has been growing faster than Japan's long-run growth rate. The Europeans were buoyant, with the NPLs of Italian banks having declined from 8 percent to 4 percent in recent months and the French economy and mood having been transformed by the recent presidential elections. The British were somewhat exceptional in this feast of happiness, but the stiff upper lip was pressed into service and did its job. One could also understand that the ECB is very concerned about the recent appreciation of the euro. Several participants expressed their satisfaction that, at long last, the major economies are all, or almost all, growing well by the standards of the day. This represents a sea change from the prevailing mood in the group during the previous meetings I have attended.

When asked what had produced this sudden change, the members of the group said that the change had been taking place gradually, and that progress in the EU had been slow but steady and has finally now reached the stage when it can be recognized to amount to something serious. They did not mention that perhaps we have also moderated our ambitions for economic growth.

Well, that is part of the good news facing the U.S. economy. The dollar has depreciated nearly 10 percent since the start of the year. And as we no longer claim that a strong dollar is in the interest of the United States, that, too, is good news. Seasonal fluctuations in the data, according to which the growth rate in the second half of the year is greater than that in the first half, can almost be relied on. Unemployment continues to be below the level the SEP suggests is the natural rate of unemployment, and the inexorable trends of a declining labor force participation rate and a U-6 unemployment rate much above its 2006 level have moderated.

The horrible hurricanes are producing real hardships for the unfortunate people who were in their paths, but their effect on the macrodata is expected to be small *ex post*. So all that remains to be done is to increase the rate of productivity growth and produce more equal distributions of income and wealth, and to decide how many immigrants should be allowed into the country each year. Oh, and to decide whether globalization is a good thing, and to reform the tax system, and to pass a budget that helps protect the stability of the economy, and to be sure that financial stability is maintained. And the trick of combining an increase in the longer-run real interest rate while avoiding serious declines in asset prices has to be carried out successfully, and, in the opposite direction, if necessary, that the effective lower bound is avoided—and to reduce the size of our balance sheet to something more normal.

Well, I need to stop, because we want all of you to have a good night's sleep, although I could go on. However, I don't want to discourage you or myself, but I do want to say that monetary policy has been very well managed during my short time on the Board, and that this is an impressive institution.

In the annals of monetary history, the fact that the United States avoided a second Great Depression will be recorded with honor. And much of the credit for that achievement will be accorded to the Federal Reserve and, no less, to the cooperation between the Treasury and the Federal Reserve. May this institution continue to be allowed to do its job as well in the near future as it has in the near past. And, with respect to some of its functions, may it do it better than it has sometimes done in the past.

Finally, with respect to the past, everyone knows that those who forget history are doomed to repeat it. But I do not believe what is reputed to have been Frank Knight's comment on that statement, and that those who remember history are also doomed to repeat it. [Laughter]



Those who remember the past are more likely to know that they can do better than their predecessors did even while sometimes making their own mistakes. And, with that, I thank you, Madam Chair, and I thank my other colleagues on the FOMC. [Applause]

CHAIR YELLEN. Thank you. Governor Brainard.

MS. BRAINARD. Thank you, Madam Chair. I just want to join my colleagues in expressing my enormous admiration for Stan Fischer as a colleague, as a key intellectual contributor in the field of macroeconomics, and as a key policy architect in the international financial system for nearly half a century.

With regard to the U.S. economy, underlying momentum remains firm despite several severe storm-related disruptions and some increase in geostrategic risk, reflecting resilient consumers and improved investment and aided by a brighter global outlook and supportive financial conditions. The labor market continues to bring more Americans off the sidelines and into productive employment, which is very welcome, but I remain puzzled by the disconnect between the signs that the economy is in the neighborhood of full employment and indications that the tentative progress we had seen on inflation has stalled.

Hurricanes Harvey and Irma have led to severe damage in Texas and Florida and will hold down GDP growth in the third quarter, but past episodes suggest the aggregate level of activity should rebound in the fourth quarter, with the likelihood that rebuilding and restocking will boost activity somewhat. In the near term, the staff is projecting GDP growth in the second half of the year stronger than we've seen in some time. Importantly, the latest indicators suggest that business spending on equipment and intangibles will increase rapidly this quarter and next at an 8 percent annual rate, up from the already solid pace of 6 percent in the first half and much better than in 2016, when spending was flat. On the other hand, unlike earlier this year when

many observers saw fiscal stimulus as presenting the possibility of a substantial boost to domestic demand, I'm now assuming, like many others, that any stimulus will be modest in size and later in effect.

Against this, we're seeing synchronized global economic growth for the first time in many years. The improvement in growth abroad has been reflected here at home in dollar depreciation, higher earnings and stock prices, tighter risk spreads, and an increase in net exports, which are expected to provide a 0.2 percentage point boost to GDP growth in the second half, which is a notable improvement over the preceding several years when net exports were a drag. In Canada, real GDP rose more than 4 percent at an annual rate in the first half of the year. Euro-area real GDP rose at a 2½ percent pace in the first half. Japan enjoyed above-trend growth in real GDP, and China rose at about a 7 percent annual rate in the first half.

The strong foreign growth outlook suggests central banks and major economies may lay out plans or take steps toward policy normalization in coming months. The Bank of Canada already raised its target policy rate at its most recent meeting for the second consecutive meeting, which was somewhat of a surprise to many observers. Given the interrelatedness of global financial markets, changes in the expected policy trajectory in other major economies could have important implications for term premiums and long-term yields in the United States, depending on the timing and approach.

Not surprisingly, when prospects for foreign growth are coming in above expectations and those for large cuts here are receding, the dollar has depreciated further since the previous meeting by about 2 percent on a trade-weighted basis. On net, the dollar is about 9 percent weaker than it was at its peak in late 2016, but it's still about 15 percent stronger than it was before the run-up in the dollar began in 2014.

Equity prices have moved up further, in part due to strong growth in foreign earnings, and the changing prospects for euro-area growth and inflation have led to a reassessment of future ECB policy, which has spilled over into our financial markets.

One interesting line of research that the staff has been extending suggests there are large spillovers of ECB policy announcements both to the exchange rate and to the long end of the U.S. yield curve as compared with relatively negligible spillovers pre-crisis. On ECB policy announcement days, according to this research, a 10 basis point increase in the German 10-year term premium was associated with a 6 basis point increase in the U.S. 10-year term premium, as well as close to a 1 percentage point appreciation of the euro against the dollar.

Indeed, financial conditions in the United States in the intermeeting period appear to be moving as much or more in response to financial news from the euro area as from the United States. Overall, the net effect is that financial conditions have loosened somewhat further since the previous meeting despite the fact that balance sheet normalization is well anticipated.

With solid economic growth in the second half of the year, we can expect the recent pace of labor market gains to continue. And, of course, while the unemployment rate has been flat over the past few months, it has moved down 0.3 percentage point since last year. These developments have been particularly notable for groups that historically experience less favorable outcomes, and this is all very welcome news.

But despite the further reductions in slack, inflation continues to run well short of our objective. As of the Tealbook, the staff was expecting an increase in core PCE prices of only about 1.3 to 1.4 percent for the 12 months through August, and, on net, the latest CPI and PPI data have done little to change this projection. There's also little indication of mounting wage increases on aggregate, as others have noted.

Now, it is true that the recent weakening of the dollar should provide some boost to core import prices. But I would expect that we would look through this contribution to inflation, recognizing it's likely to pass through relatively quickly and be transitory, just as we didn't respond to the drag on core inflation arising from the steep appreciation of the dollar, instead noting that we expected the effect to be transitory in every statement from June 2015 to December 2016.

The recent lack of progress on inflation is troubling against the backdrop of five straight years of undershooting our target. As was stressed in the staff's memo on inflation last time, we can't dismiss the possibility that underlying trend inflation is running below our longer-run objective. The staff reviewed a variety of estimates, and most estimates of underlying inflation were materially below 2 percent. If that's true, it's imperative to bolster longer-run inflation expectations if we're to achieve our inflation objective on a sustained basis.

In addition, if the neutral rate remains low relative to its historical value—a situation I expect—there's a high premium on guiding inflation back up to target so as to retain space to buffer against adverse shocks with conventional policy and to guard against slippage in expectations. A policy path that moves inflation back to target will likely also lead to tighter labor markets and a lower unemployment rate. And as unemployment is already near its low point in the previous recovery, this raises some risks.

Counterbalanced against the unmistakable benefits of bringing more people back into productive employment, historically there have been two sources of risks associated with episodes such as this. One, of course, is the breakout of inflation. The other is the buildup of financial imbalances. In the current circumstances, there's a risk that the Phillips curve could reassert itself in a nonlinear way. But, given global forces as well as this Committee's well-

established track record of anchoring inflation expectations to the upside and ample conventional policy space to respond, this wouldn't appear to be the primary risk today.

To be clear, while this does suggest an overly preemptive approach may be unwise, it doesn't mean holding off on rate increases until our medium-term inflation objective has been realized. Standard rules and procedures would suggest that the federal funds rate could be gradually raised to its neutral value as the shortfall in inflation narrows. Instead, the primary risk would appear to be that of generating financial imbalances, and many observers have noted precisely this tension in each of the past two cycles.

Of course, it is important to be especially vigilant with regard to the signs that asset valuations appear to be elevated, and we've talked previously about some areas where that has been true. So far, nonetheless, there are few signs of a dangerous buildup of leverage or of maturity transformation, both of which have traditionally been important contributors to overall instability. And we can attribute that, in part, to the important safeguards that have been put in place since the crisis. Nonetheless, I recognize it will be very important to be vigilant as we continue to try to guide inflation back up to target. Thank you.

CHAIR YELLEN. Thank you. President Harker.

MR. HARKER. Thank you, Madam Chair. And, Governor Fischer, I, too, want to thank you for your service. But I have to say, Brian, I should have asked to go early, because this is the very definition of a tough act to follow, so I do not appreciate going now. [Laughter]

Over the intermeeting period, economic activity in the Third District has firmed a bit, with moderate growth in most sectors. Employment growth has rebounded, and growth in nonresident investment has outpaced that of the nation. Retail sales have also picked up, although there's evidence of continued struggles, as in many Districts, at many brick-and-mortar

stores. Residential real estate, however, is a prime exception, with housing permits looking flat over most of this year.

Led by job growth in leisure and hospitality and in education and health services, three-month average employment growth in the Philadelphia region increased in both July and August and, uncharacteristically, outpaced that of the nation. Further, the unemployment rate remained at 4.7 percent. Year-over-year employment growth has been steady. However, we have seen a noticeable decline in hiring by governments. New Jersey and Pennsylvania face significant fiscal challenges. The Pennsylvania legislature has yet again failed to pass a budget and has given a warning of the potential downgrade to the state's bonds. New Jersey, although having its debt upgraded from "negative" to "stable" because of dedicated lottery revenue for its pensions, is still facing many hurdles.

Growth in nonresidential construction has been steady, if somewhat volatile, and vacancy rates in Philadelphia remain at very low levels. The same cannot be said for residential housing, as we have witnessed little to no growth for some time. Although house prices continue to firm, that firming is rather sluggish by national standards.

Our outlook for manufacturing remains one of steady growth. Our September manufacturing index, which will be released this Thursday, remains above its nonrecessionary average, and the details of the report were encouraging. We saw significant bouncebacks in both new orders and shipments, and the employment index remains high. There are also signs of price pressures, as there were significant increases in both the prices-paid and prices-received indexes.

It also appears that Hurricanes Harvey and Irma may provide some stimulus to the automobile sector. A manufacturer of auto parts in our District indicated that his order book has

grown by double digits in the past month as manufacturers gear up for anticipated increases in demand.

With respect to future activity, manufacturers appear to be quite bullish and have plans to increase hiring and capital spending over the next six months. Services also rebounded in our August survey, with increases in sales and shipments as well. Additionally, consumer confidence remains in optimistic territory, and retail activity has improved.

With regard to the national economy, my forecast is not very different from that of the staff. I project slightly weaker near-term GDP growth and slightly stronger growth in the outyears in our forecast. I also don't anticipate the unemployment rate falling quite so low. I project it to decline to 3.9 percent in 2018, before gradually rising to 4.1 percent by 2020. Our paths for inflation are identical. With regard to the funds rate, I anticipate that it will be appropriate to raise it gradually to 3.2 percent by the end of the forecast horizon, a rate that is 0.2 percentage point above my longer-term neutral rate.

However, I continue, as others have expressed, to be concerned over whether our inflation projection will be realized, as that series has remained persistently low. It may be that the natural real interest rate will remain low, resulting in the funds rate being uncomfortably close to the effective lower bound. At the effective lower bound, policy may not be very effective in raising inflation in a timely manner, creating an asymmetry in the distribution of inflation outcomes. In that environment, a 2 percent target could result in less than a 2 percent average inflation rate. That is, the mean of the ergodic distribution can be different from the steady state.

I hope the latest CPI number will be a harbinger of further firming in inflation, but this is only one number, and I remain concerned that our 2 percent target may prove to be elusive. So

persistently low inflation remains the most significant risk to my forecast. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Madam Chair. The 11th District is working to recover from the effects of Hurricane Harvey, and I must say, we appreciate the outpouring of support from around this table and from around the Federal Reserve System. Thank you.

We, along with the Board staff, have examined the effects of other storms to try to learn the likely effect of Harvey. Consistent with the Tealbook, our base-case assumption is that property damage due to this storm is likely to be in the range of \$75 billion to \$100 billion. Most of this damage was due to flooding versus wind and other forms of hurricane damage. Of that amount, we estimate that approximately \$45 billion to \$55 billion is due to home damage, \$15 billion to \$20 billion is due to commercial damage, \$8 billion to \$12 billion is due to vehicle damage, and \$5 billion to \$10 billion is likely due to infrastructure damage. Unfortunately, some substantial percentage of these losses, we believe, will ultimately prove to be uninsured, particularly the home losses.

In addition, we estimate that lost economic output will be in the range of \$10 billion. We also expect some degree of short-term job loss in the Gulf Coast of Texas, and we expect that to be in the range of 40,000 to 70,000 jobs, but we believe these losses will be temporary. A preexisting shortage of skilled construction workers will likely, however, act as a drag on rebuilding efforts.

In terms of housing before the storm, we believe that there was a multifamily rental housing oversupply in the city of Houston. Not surprisingly, since the storm, the occupancy rates in rental housing have risen substantially, and the multifamily housing overhang appears to



have been eliminated. One large multifamily developer in Houston told me he now plans to accelerate the announcement and building of at least one additional new property to meet expected demand.

The storm has also generated substantial discussion of undocumented workers in Houston specifically and in Texas generally. Our business contacts estimate that approximately 600,000 undocumented workers work in the greater Houston area. It is estimated that a substantial percentage—as high as 50 percent—of construction workers in the Houston area are undocumented and have been working in the Houston market for many years, often as independent contractors or with fabricated Social Security numbers. These workers are likely going to be reluctant to report property damage and seek assistance and certainly may be reluctant to go to work at companies other than as independent contractors. In addition, we have learned that, in the aftermath of other storms an influx of undocumented workers is often needed to help with the reconstruction effort. And there is now renewed concern that these workers may be unlikely to want to come to Texas to help in this effort. This is a significant discussion, and I think it's a healthy conversation. We expect it to continue in the state of Texas.

There is also a great concern about the potential failure rate of small businesses in the Houston area, particularly those that might not be able to weather a period of business interruption. This is where banks are going to have to work with borrowers and make tough judgments about the future business prospects of these businesses regarding not only their ability to service existing debt, but also the suitability of these businesses for new loans, which will be necessary for them to weather this crisis. Contacts in Houston are concerned that an estimated failure rate of small businesses as high as 50 percent could come to pass, and so the community

is gathering together, including the banks, and talking to us about how we're going to manage this situation.

Of course, the Gulf Coast is home to a substantial concentration of the refinery capacity in the United States, and the outages resulting from storm-related shutdowns temporarily affected oil inventories and gas prices, as has been discussed earlier, leading to a surge in gas prices. Our current estimate, though, is that the refinery industry is now substantially—not completely, but substantially—back online as we sit here today.

The storm also has not changed our basic estimates regarding global supply and demand in the oil business. We continue to expect a fragile equilibrium over the next few years, with price rises met by greater shale supply—that is, greater drilling—and price declines met by reduced shale drilling. But, as we've said before, as we look out three to five years, we continue to believe that the price risk is to the upside, again because of the lack of substantial long-lived—that is, non-shale—drilling investments, the rapid declining curve of shale wells, and an expectation that annual global demand will grow on average by approximately 1.3 to 1.5 million barrels a day.

Our judgment is the storm will negatively affect economic activity in the 11th District in the third quarter, as many of you have said. And, consistent with other comments, we believe we will have a period of catch-up in the fourth quarter and potentially beyond, depending on the availability of labor. It is still, though, our base-case expectation that we should be able to ultimately resume trend growth in the 11th District after a period of catch-up and rebuilding. Interestingly, our forecast of 2017 job growth is unchanged from pre-storm estimates. We still believe it will be a little over 2½ percent.

In terms of the nation, it is our estimate that 2017 GDP growth will be approximately 2¼ percent. This is a little bit weaker, of course, than is forecast in the Tealbook, but it should be sufficient to tighten the labor market further. Our 2018 estimate also shows slower growth than in the Tealbook but still above the potential rate, with the unemployment rate falling below our estimate of the longer-run sustainable rate.

We also believe that cyclical inflation pressures are, with a lag, likely building. However, as has been discussed, these forces are being offset by structural effects. I listened carefully to President Williams's comment about acyclical factors such as health care, which we will also do more work on. I will continue to talk about technology-enabled disruption, which I will come back to, and, to a lesser extent, globalization.

In terms of discussion with our contacts—and I'll probably say more on this in November when there's more time—I still believe that we will continue to see the emergence of technology-enabled disruption affecting numerous global businesses. This is not a new trend in the last number of years, but I believe the rate of change in this trend is new and noticeable. Discussions with our contacts suggest it is affecting the ability of businesses to price their goods and services.

It's also affecting how businesses value unskilled labor versus how they value skilled labor. And, interestingly, it's affecting industry dynamics. In particular, I talk very frequently to business leaders who feel the need to dramatically increase their investment in IT. And because of the need for these greater investments, merger activity is much more common. In particular, in order to either maintain or increase margins, businesses are much more likely to merge. For example—I will talk about this another time—in the car dealer business, today many banks I talk to are now reluctant to lend to a single car dealer. They are concerned that unless you merge and

you get scale, you are unlikely to be able to be competitive because of the technology-enabled disruption—the “digital storefront”—that most car dealers are now using.

I do believe that margins of the kind President Bostic talked about need to be segmented, and I think you may find, when you look at the record level of M&A activity globally, that much of it is intended to get scale and combat falling margins, and it’s the way businesses are adapting. I think that probably bears further examination.

Last comment—I have lowered my estimate of the longer-run neutral rate to 2½ percent, and I am respondent number 6 in the SEP. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Evans.

MR. EVANS. Thank you, Madam Chair. I want to congratulate you on drafting Stan Fischer into the Federal Reserve and, Stan, for your agreeing to serve. I was an undergraduate at the University of Virginia in the late 1970s when I was taking an intermediate macro course, and the book that was selected for the class was Dornbusch and Fischer. I believe it was the earliest edition, and that course for me was very inspiring in deciding to become an economist, and the book was very important, too. I think back on that, and I don’t know how I could have hoped, in sitting in that class, to aspire to serve on the Federal Open Market Committee with you. Thank you very much.

MR. FISCHER. Thank you very much.

MR. EVANS. Madam Chair, the momentum behind real activity seemed to be increasing further before Hurricanes Harvey and Irma hit. The staggering losses coming from the storm are heart-wrenching, and the disruptions to economic activity this quarter will be substantial. But the fundamentals for the real economy remain solid. So, like the Tealbook, I see activity

bouncing back quickly and average GDP growth running faster than potential over the next several quarters.

I continue to be concerned, however, about persistently low inflation. Last week's CPI was an improvement, but, like the Board staff, I don't see it as changing the outlook for PCE inflation very much. My views on economic activity and inflation are quite consistent with what I heard from my directors and other business contacts. These reports indicated yet another modest increase in optimism about real activity, both in the United States and around the world, and no reports suggested that any pickup in inflation is coming.

The positive international outlook was emphasized by Manpower's CEO, who noted that, for the first time he could remember, its quarterly poll of business hiring plans showed net increases in all 43 countries that it surveys, and I think that's quite consistent with Steve Kamin's squinting chart that shows less dispersion at higher levels of economic growth. Similarly, our director who is from Motorola Solutions described demand as "solid and strengthening" in each of its international operating regions.

The scope of the domestic expansion appears to be broadening as well. For some time, reports of strength have been limited to the consumer. This time around, I also heard more positive news on business spending. Manufacturers were generally upbeat, and this is no longer just optimism about future prospects. Many are seeing actual increases in orders. The news from consumer-facing sectors generally remained encouraging. For example, our contacts at Discover Financial reported continuing robust growth in credit card usage before the hurricanes. They also saw very high transaction volumes in affected areas immediately before and after the storms hit and thought the hurricanes actually would be a net positive on consumer spending.

The auto sector, however, has been a soft spot. Inventories became elevated after sales stepped down in the spring and summer, and automakers trimmed assemblies in the third quarter in an effort to bring stocks back in line with sales. They had expected to cut production plans again next quarter, but with the hurricanes destroying a half-million or more vehicles, that may not be necessary now—along the lines of, and consistent with, President Kaplan’s comments about multifamily housing.

The generally upbeat assessment about the economy carried over into the discussions about labor markets. Notably, I heard a few more reports of wage increases to address the difficulty in finding qualified workers, both those with specialized skills and those at the entry level. While this news is heartening, we heard little about these wage gains showing through to price increases. And some of my contact reports indicated continuing confidence in the underlying pace of growth—a tight labor market, but few price pressures.

With regard to the national outlook, the incoming data point toward solid underlying momentum and aggregate demand. We think that this will translate into decent net growth in the second half of the year. Consequently, we revised our 2017 real GDP growth projections up to 2½ percent. And, by the way, we are number 7 in the SEP.

Our assumptions about the economic effect of the hurricanes are broadly in line with the Tealbook and have little net effect on our fourth-quarter-over-fourth-quarter growth rate. Our outlook for economic growth over the remainder of the projection period also is broadly in line with the Tealbook. However, our forecast of inflation is lower. One reason is that we have a somewhat higher potential output path, so our forecast generates modestly less resource pressure.

More importantly, however, we think that the string of disappointing news on inflation since winter signals more persistent weakness in underlying inflationary trends than is assumed

in the Tealbook. In our projection, core PCE inflation is 1.8 percent in 2019, and it doesn't reach 2 percent until late in 2020.

Furthermore, this forecast is predicated on a shallower federal funds rate path than assumed in the Tealbook. In order to support even our very slowly rising inflation path, our SEP submission has an assumption of no further rate hikes this year. We penciled in three rate increases in each of the next two years and then have the funds rate flattening out at our assumed longer-run level of  $2\frac{3}{4}$  percent in 2020. Such a gradual path seems necessary in order to open up wider resource gaps and, more importantly, to bolster inflation expectations by demonstrating our commitment to a symmetric 2 percent inflation target.

In order to achieve this objective, we need an upward pull from inflation expectations. I haven't seen anything yet to make me confident that this is currently under way. There are a number of hypotheses about what might be holding back inflation. At some level, many of these turn out to be cases of changes in relative prices dominating the inflation indexes and masking the underlying inflation arising from monetary policy. To me, I think that means we need more policy accommodation, in order to offset headwinds facing inflation. How much? That's the question. Indeed, I continue to believe the FOMC's biggest risk is that inflation expectations will settle in below 2 percent, making it very difficult for us to deliver on the inflation leg of our dual mandate. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President George.

MS. GEORGE. Thank you, Madam Chair. Overall economic activity in the 10th District continues to increase, and our contacts generally remain optimistic. Recent job growth has been positive, and our monthly surveys show that factory and services activity continues to rise solidly. Unemployment has fallen to  $3\frac{1}{2}$  percent in the District and is below 3 percent in states

like Colorado and Nebraska. With labor increasingly tight, the share of firms in our services survey reporting wage pressures rose above 50 percent in August after hovering in the 30 to 40 percent range the previous three years. And an increasing share of firms also reported raising prices more than any time in the past few years, noting rising wage pressures.

Energy activity, however, cooled off since the previous meeting. Rig counts flattened out well before the hurricanes as oil prices remain stuck below \$50 a barrel and world inventories remain high. The leveling-out of energy activity occurred at a high level, though, in terms of the effective rig count, which is a measure that takes into account rig productivity gains. And that measure of activity recently rose above its 2014 peak. The implication is that the contribution of the oil and gas sector to job growth in the District may decline in the coming months, and its effect on the region's overall job growth would be felt, as the energy sector directly accounted for over 10 percent of all job growth in the first half of the year and likely was responsible for increased hiring in other sectors.

The hurricanes disrupted energy pipeline, refining, and trade activity, pushing inventories up and WTI prices down. Some District energy companies also reported temporarily halting drilling in South Texas just before and after Harvey. They have since resumed. Few companies have adjusted down their 2018 drilling plans, and our energy contacts generally expect hurricane effects to be temporary.

Finally, the farm sector remains under pressure. The corn harvest is under way in the Midwest, and estimated yields look strong, suggesting commodity prices are likely to remain low for the foreseeable future, with high global inventories. With low farm income for a fourth consecutive year, ag credit conditions have weakened further, although the pace of deterioration appears to have slowed in recent months.



With respect to the national economy, my outlook is little changed since our previous meeting. I made few changes to my SEP, as I assumed that offsetting hurricane effects in the third and fourth quarters would lead real GDP growth above trend for the year. I did lower my estimate of the long-run unemployment rate to 4.8 percent, doing so primarily to reflect ongoing demographic changes related to an aging workforce. I expect GDP growth and job growth to moderate toward their trend levels next year, with some further declines in the unemployment rate and a return of inflation closer to 2 percent.

Consumer spending continues at a solid pace, and confidence levels remain high. Business fixed investment has picked up this year, and equipment spending in particular seems poised to rise further in the near term. According to the NFIB, the percentages of small firms planning capital spending and those reporting that now is a good time to expand are at their highest levels since 2006. Core capital goods shipments also have generally been on a steady upward trend over the past 12 months. The recovery in capital spending is encouraging and suggests that the earlier business confidence has advanced from soft to hard data.

In the labor market, payrolls have been boosted by strong gains in goods-producing employment. A substantial portion of the recent pickup likely reflects an unwinding of the contractionary effects of past dollar appreciation and oil price declines on manufacturing and mining activity. As that unwinding proceeds, I expect this source of job gains for goods producers to wane, and I continue to anticipate a gradual slowing of total payroll gains over the next couple of years.

The Federal Reserve Bank of Kansas City's labor market index points to tight conditions. This index uses some 24 labor market variables to judge the labor market's level of activity and its momentum. The level of activity continues to show improvement and is currently about equal

to its level at the end of the previous expansion. Likewise, the momentum indicator remained at a high level, suggesting strength over the near term. Among the key variables driving that improvement over the past six months were an increase in the JOLTS quits rate and a decrease in the number of people working part time for economic reasons as a share of household employment. These are favorable developments, to be sure. But with the level of activity and momentum already above their historical averages, the ability to sustain these labor market conditions in the longer run is questionable.

With regard to inflation, the softness in core inflation this year appears fairly broad based and continues to elude not only the Committee's desired longer-run target, but also, as we've discussed here, clear explanations for why we are seeing such disinflationary pressure in the face of above-trend economic growth and strong labor markets. Since the FOMC adopted the inflation target in 2012, the Committee's desired measure has stubbornly resisted making a sustained return to the 2 percent level, although my view is that it has remained within a range consistent with the longer run goal, as stated in our annual Statement of Longer-run Goals and Monetary Policy Strategy.

I find it difficult to look at the economy's performance—with high levels of employment, low levels of inflation, and above-trend growth—and conclude that the current level of inflation is problematic for the real economy. Indeed, absent a designated target of 2 percent, one might reasonably conclude that our legal mandate to seek maximum employment and price stability, as framed in the Federal Reserve Act, was right on track.

While we should continue to monitor longer-term inflation expectations carefully, I remain confident that a forecast of higher inflation is reasonable. For example, financial market data are consistent with stable inflation over the medium term. The Tealbook's 70 percent

confidence interval for the core PCE inflation forecast in the next five years lies roughly between 1 and 3 percent. Similarly, the Federal Reserve Bank of Minneapolis options-implied probabilities show that the probability that CPI inflation in the next five years remains between 1 and 3 percent currently stands at 76 percent, the highest level observed since the end of the previous recession. Furthermore, the probability of a CPI inflation rate above 3 percent or below 1 percent in the next five years remains low, about 11 percent and 13 percent, respectively.

Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kashkari.

MR. KASHKARI. Thank you, Madam Chair. The Ninth District labor market is generally healthy. Several regional surveys show moderate growth but strong prospective hiring. There's some evidence that the tightening labor market is pushing up wages. Average hourly earnings in Minnesota are rising at about a 5 percent rate. There's variation across sectors, with manufacturing and construction generally mixed. Agriculture is weak, with the Dakotas and Montana struggling with drought. Price pressures are generally mild. Surveys on cost of living show little change in the second quarter, with several District cities seeing slight price decreases, and, as others have noted, Hurricane Harvey's effect is being seen in higher retail gas prices.

In terms of inflation, core 12-month PCE continues to be low at 1.4 percent on a 12-month basis. This is a large shortfall in relation to our target of 2 percent. We've now experienced low inflation readings for the past six months. Core inflation has declined about ½ percent since December of last year, while monthly CPI bounced back only a bit last week.

Now, as Steve and I talked about earlier, inflation is low around the world, with core stable at around 1 percent in advanced foreign economies since 2015. Measures of expected inflation are also low. Inflation breakevens continue to be low and, at face value, continue to

indicate future PCE inflation well below 2 percent. Survey-based measures also continue to be low.

With regard to the real economy, retail sales came in weak, with downward revisions for the previous months. As others noted, the hurricanes likely won't have much of an effect over the medium term. For tax cuts, I continue to assume no change to fiscal policy. It seems like it becomes less and less likely the more time goes on, but we'll see. In terms of the national labor markets, labor force participation and employment-to-population continue to hold up pretty well. They're reasonably flat since the previous meeting, with no uptick in nominal wage growth in sight.

So to put all of this together, employment gains continue to be robust. The Phillips curve suggests that inflation should be coming, but there are no signs of it yet. The question is, why? I thought President Bostic did a nice job running through the various alternative explanations. I would just add a perspective on which ones of those are likely to be temporary. One factor is that, if it's automation, it's not likely to be temporary. A second is, if it's global labor supply because of China, it's also not likely to be temporary. A third factor that is temporary could be that there might still be some slack. I think Governor Powell mentioned the prime-age employment-to-population ratio is one statistic suggesting that significant slack still remains. Even after factoring in the effect of the opioid epidemic, as analyzed by Professor Alan Krueger, there's at least another year, maybe two years, before the economy returns to trend prime-age employment-to-population ratios. That's pretty meaningful slack. A fourth factor, also not likely to be temporary, is that low inflation expectations are holding down actual inflation. When we look at it, inflation expectations started to decline around the time that the Committee started to reduce accommodation. Five-year, five-year TIPS breakevens are down from around

2<sup>2</sup>/<sub>3</sub> percent in December 2013, when the Committee started tapering, to around 2 percent now. Michigan surveys are down around 40 basis points over the same period.

With hindsight, perhaps we could argue that we've tightened too much too soon, tightening both through actual rate increases and signaling a rapid upward path of interest rates. One example is, the December 2014 SEP median forecast had a federal funds rate of 2.5 percent at the end of 2016—which is a pretty steep path. I think, with the benefit of hindsight, we now know that  $r^*$  and the natural rate of unemployment are lower than we appreciated a few years ago.

So, in conclusion, inflation is still too low. Possible explanations that resonate with me are that there's more slack than we appreciate, that inflation expectations have slipped, and that policy has been too tight. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you, Madam Chair. My reading of the evidence since the previous FOMC meeting is that the economy continues on a trajectory of slightly above-trend growth and a gradually tightening labor market. We've been saying that for quite some time, now. In my view, this is likely to continue. Consumption should be supported by the income generated by sturdy job gains and the stable-to-rising wage compensation inflation picture. Higher equity prices and home prices also should provide additional support. Investment spending should continue to advance as tight labor markets increase the incentives to substitute capital for labor. Finally, the trade sector is unlikely to exert a significant restraint on output. The recent weakness of the dollar and the improvement in foreign growth prospects are important developments in this area.

I view the near-term recession risk as very low, barring some large, unanticipated shock to the economy. In the coming months, our ability to discern whether this trend actually remains in place may prove difficult, and I believe the damage wrought by Hurricanes Harvey and Irma will restrain economic growth, especially in August and September. But thereafter, as many have noted, rebuilding efforts are likely to lift growth, and I would anticipate that lift to persist into 2018.

Conversely, these storms will lift inflation in the short term, as many have noted, because of higher gas prices. However, there also may be some longer-term effects that are not yet very visible. As President Kaplan pointed out, I think finding the construction workers necessary to rebuild could prove difficult at a time when the economy is close to full employment. So, at the margin, this could lead to slightly more pressure on wages and prices.

The key question I continue to wrestle with is a question I think everyone around the table is wrestling with: Why do inflation and the rate of increase in labor compensation remain so low at a time when the U.S. labor market utilization has tightened significantly? And, as President Bostic and others have noted, there are a number of competing explanations. Perhaps we can dismiss the decline in inflation as a result of special one-off factors. But this becomes harder to do the longer inflation stays lower than anticipated. Or perhaps the level of unemployment consistent with our 2 percent inflation objective is lower than we anticipated. It could be that the emergence of Internet retailing and other disruptive technologies is putting sustained downward pressure on prices. But this argument also has its own weaknesses. In particular, why is this becoming evident just now? After all, the disruptive forces unleashed on U.S. retailing by Amazon and its related Internet kin are not new phenomena. Or maybe it's a bit of both: one-off factors and more-intense competitive pressures. At this point, I think, like a

majority of people around the room, I'm mostly inclined toward the "one-off transitory factor" story.

Now, even if the uncertainty about inflation proves persistent—and that could definitely happen, and we may not have this resolved by the December meeting or the March 2018 meeting—I don't think this rules out further rate hikes for several reasons. First, there is a risk of getting fooled by an inflation path that has turned downward, but maybe only temporarily. In that scenario, if we delay too long, the risk would be that we push the economy too far beyond full employment. This would increase the risk that we would have to respond more aggressively, raising the risk of a future recession. Second, I think you'll also want to evaluate the appropriate level of the federal funds rate in the context of financial market developments. Financial conditions have become easier, even as we have tightened monetary policy. I don't see how one can ignore this when evaluating the appropriate level of short-term interest rates at this particular point in the economic cycle.

Uncertainty about inflation versus easier financial conditions are offsetting developments, in my own mind. That's why I've kept one additional interest rate hike for 2017 in my SEP submission. I think it's important to keep the possibility of a December rate hike alive, because of how easy financial conditions already are and the fact that market participants are somewhat skeptical that we will, in fact, actually raise our federal funds rate target in December.

Now, I'm going to have more to say about Stan tomorrow, but I have followed the strategy that getting the last word is often a very good strategy. [Laughter] So, the end of the day tomorrow.

MR. FISCHER. Thanks.

CHAIR YELLEN. Well, my thanks to everyone for a rich discussion of the economic outlook and associated risks. I'd like to wrap things up with some comments on the data we have received over the past few months and some of the concerns they raise. Starting with the labor market, employment growth continues to run well ahead of the pace that is likely to be sustainable in the longer run. Payroll gains have averaged 175,000 per month since the start of the year, and the two reports we have received since our previous meeting provide no evidence that the pace is slowing. Nonetheless, the unemployment rate is little changed over the past six months. The broader U-6 measure has also been unchanged in recent months, and measures of aggregate wage growth remain subdued, although there are abundant reports of firms raising wages more rapidly. I'll return in a moment to the implications of these developments for labor utilization and monetary policy.

Looking forward, incoming spending and production data suggest that employment growth is likely to remain solid over at least the next few quarters, abstracting from the temporary effects of Hurricanes Harvey and Irma. Consumer spending appears to have continued to expand at a moderate pace, on average, into the summer, at least before Harvey hit Texas. And, in contrast to last year, business investment has clearly picked up and is now making a substantial contribution to overall real GDP growth. In addition, the staff now estimates that net exports are likely to contribute modestly to economic growth in the second half of the year—an upgrade from the drag they previously anticipated, reflecting, in part, the depreciation of the dollar in recent months and solid foreign growth.

All in all, the outlook for economic activity into next year looks a little brighter than I expected back in June, although I haven't materially revised my assessment for average economic growth over the medium term. That said, the hurricanes will clearly have a marked



effect on the readings we will receive over the next few months on employment, production, and spending. The devastation wreaked by these two storms on parts of Texas, Louisiana, and Florida is staggering. It will be a long time before many communities recover, although I was heartened by President Bostic's remarks about the resilience that he's seen in the affected areas.

Past experience suggests, and the Tealbook assumes, that on the national level the hit to employment and output due to these storms is likely to be limited and temporary. A similar conclusion applies to inflation. As President Kaplan noted, hurricane-related disruptions in the production and distribution of gasoline and other products have caused consumer energy prices to move up sharply in the past few weeks. And the staff estimates that these increases will boost headline inflation noticeably in September and October, but the effect should wash out of the data as production returns to normal, with both overall and core inflation running at around 1½ percent on a 12-month basis in December.

Like most of you, I've revised down my projection for core inflation this year. Back in March, I projected that both headline and core PCE prices would rise about 1.8 percent in 2017, thereby sustaining the progress toward our inflation goal made in 2016 and supporting this Committee's expectation that inflation would stabilize at 2 percent over the next couple of years. It's now apparent that we've actually lost ground since last year, even though labor market conditions have strengthened and movements in food, energy, and import prices have been relatively modest.

So how concerned should we be about the inflation outlook? In view of the inherent volatility in inflation not only from month to month, but also on a 12-month basis, I'd argue that we should not be all that surprised by such a forecast miss. The fan charts we have added to the SEP are designed to highlight such uncertainty.

Idiosyncratic one-time price shocks—such as the declines in prices for telecom services that we saw last spring—can cause inflation on a 12-month basis to move appreciably from year to year. Such shocks contribute importantly to the width of the forecast confidence intervals that David showed earlier. If this year’s inflation shortfall is largely due to such idiosyncratic factors, then the consequences for monetary policy should be minor because the influence of those factors on inflation should fade over time as long as inflation expectations are well anchored.

In my inflation forecast, I’ve assumed that this year’s unexpectedly low inflation largely reflects transitory shocks. But I wouldn’t rule out the possibility that it signals the influence of more-persistent developments. President Williams highlighted developments that have been depressing the growth of health-care prices for several years. Because health care accounts for a large share of total consumption, this slow growth has restrained overall inflation materially and may continue to do so over the medium term. A similar situation occurred during the 1990s, when a significant shift in health insurance enrollment away from fee-for-service and toward HMO plans reduced cost pressures and held down overall inflation for several years. If these sorts of favorable supply-type shocks to specific sectors continue, achieving our 2 percent inflation goal over the medium term may require a more accommodative stance of monetary policy than assumed in my baseline outlook.

Another possible explanation for continued low inflation is that I’ve overestimated the upward pressure on inflation coming from the labor market. It’s true that many indicators alongside the unemployment rate—such as the quits rate, job openings, and household assessments of job availability—are back to their pre-recession levels or even stronger. And for those indicators that haven’t fully recovered—such as the prime-age employment-to-population ratio and involuntary part-time employment—the explanation may have more to do with secular

trends than any remaining slack. But, even if labor market conditions have, on balance, returned to where they stood before the financial crisis, that return does not necessarily demonstrate that the economy is now at maximum employment.

Because of demographic shifts, ongoing globalization, and changes in the competitive structure of product and labor markets, the unemployment rate that's sustainable today may be lower than the rate that was sustainable in the past. One reason to be open to this highly desirable possibility is the subdued growth of hourly wages and compensation. While average hourly earnings in the Atlanta Fed's Wage Growth Tracker have picked up some as the unemployment rate has come down, ECI growth has been more or less flat at less than 2½ percent over the past three years. In addition, hourly compensation has actually decelerated and is now running below 2 percent. To a degree, subdued wage growth may simply be a consequence of slow productivity growth, as some Board staff analysis suggests. Moreover, research at the Federal Reserve Bank of San Francisco suggests that changes in the composition of the workforce may be currently holding down wage growth appreciably. But this research is not so definitive that it precludes the possibility that subdued wage gains are a sign that the sustainable rate of unemployment is lower than we currently judge, especially given the imprecision of any estimate of its value.

Inflation expectations are another area of concern. Although survey evidence, on balance, suggests that longer-run inflation expectations remain reasonably stable, some surveys suggest slippage in household expectations. And we can't be sure that the various readings aren't at levels consistent with expected longer-run PCE inflation below 2 percent, as the Tealbook assumes.

In light of these possibilities, we should be prepared to adjust our estimates of the natural rate of unemployment, longer-run inflation expectations, and other key influences on the inflation outlook in response to incoming data. Such learning would be a continuation of our standard practice. Over the past five years, the median of our longer-run unemployment projections has declined almost 1 full percentage point. And if the data over time point to further downward revisions, we should do so.

An important policy question for this Committee in the months ahead will be how long we should hold off on further policy actions while collecting evidence on whether this year's slowdown in inflation is, in fact, transitory. I believe that patience is warranted, but also that it cannot be unlimited. In the face of lags in the response of inflation to resource utilization, the balance of risks will increasingly point in the direction of further policy tightening if employment growth remains strong and the unemployment rate moves down further. Thus, labor market developments may make it appropriate to raise the target range for the federal funds rate later this year even if there are still few signs that inflation has started to pick up. I would urge you all to avoid being too definitive about the likelihood of another rate increase this year until we see what the data on both inflation and the labor market have to say.

In considering further adjustments to the federal funds rate down the road, we will also have to wrestle with the implications of recent movements in overall financial conditions. As the Vice Chairman has emphasized, financial conditions overall are accommodative. And, on this criterion, our policy actions to date don't appear to have left much of an imprint.

Since our meeting last December, longer-term Treasury yields have fallen almost  $\frac{1}{2}$  percentage point, stock prices have risen more than 8 percent, and the dollar has depreciated roughly 6 percent. Of course, asset prices may reflect many factors, and so we shouldn't

conclude that our policy actions have been ineffective. In particular, as President Williams emphasized, we should be cautious about assuming that these financial market developments necessarily signal stronger aggregate demand. After all, lower longer-term interest rates and higher asset prices can be a sign of increased pessimism about the longer-run strength of spending and, therefore, a lower neutral funds rate.

That said, the lack of any material slowing in employment growth so far this year could be a sign that the neutral federal funds rate has increased and that our actions have done less to tighten the effective stance of monetary policy than it might appear. As with the sustainable rate of unemployment, we should be prepared to adjust our assessments of the neutral federal funds rate if the data call for it.

Let me wrap up with just a few words on our balance sheet policy. Beginning the process of reducing our securities holdings will mark a milestone in the normalization of monetary policy. We have worked hard to craft a good strategy for shrinking our balance sheet and for carefully communicating that plan to the public. I strongly support announcing in tomorrow's policy statement that implementation of our plan will begin in October. My expectation and my hope are that doing so will not spark much of a reaction, as this action has been anticipated by market participants for some time.

So let me stop there. We still have plenty of time, and let me turn the floor over to Thomas for his briefing.

MR. LAUBACH.<sup>6</sup> Thank you, Madam Chair. I will be referring to the handout labeled "Material for the Briefing on Monetary Policy Alternatives."

The annual extension of the horizon for your projections provides an opportunity to take a longer perspective on the evolution of your projections and to consider how your views on the underlying strength of the economy and its implications for the

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<sup>6</sup> The materials used by Mr. Laubach are appended to this transcript (appendix 6).

path of the funds rate have changed. The panels on my exhibit examine that issue through the lens of your SEP-implied neutral real rates.

As Michiel noted earlier, the medians of your assessments of the appropriate federal funds rate at the end of this year and the next two have changed little since June. As shown by the black and blue lines in the upper-left panel, they are also largely similar to the projections you submitted a year ago. This similarity contrasts starkly with the situation last September, when a number of factors had held back progress toward your objectives and, as a result, you moved down your policy path and lowered noticeably your assessment of the longer-run federal funds rate. Over the past 12 months the economy has evolved, on balance, in a way that has not led to a significant reassessment of the appropriate path for policy. And, as many of you already remarked, most of you project core inflation this year to run around  $\frac{1}{4}$  percentage point lower than you expected a year ago, but you view this setback as transitory, in part because the unemployment rate has declined about  $\frac{1}{2}$  percentage point more than you expected. You have attributed some of the decline in unemployment to a decline in the natural rate, but most of you see it as also representing tighter resource utilization. Taken together, your projections suggest that you now judge it will take a somewhat tighter labor market to achieve a return to 2 percent inflation over the next two years.

The remaining panels update an analysis that I have presented a couple of times before. They provide an assessment of how your SEP numbers have evolved over the past year while taking into account the joint determination of your goal variables and appropriate policy. The box at the top right summarizes the key steps in the exercise: First, I estimate an IS equation that relates the unemployment gap ( $u$  minus  $u^*$ ) to its own lag and the lagged real rate gap, defined as the deviation of the real federal funds rate from a time-varying equilibrium level ( $r^*$ ). This equation has the property that, if the actual real rate were kept at its equilibrium level, the unemployment gap would close over time, but only gradually so. The coefficients in this equation are estimated over the 1961–2016 period using data for the fourth quarter of each year, the staff's estimates of  $u^*$ , and estimates of  $r^*$  taken from the Laubach-Williams model. With the estimated coefficients in hand, I insert each participant's projected values for the unemployment rate and the real federal funds rate as well as his or her estimate of the longer-run normal unemployment rate and solve the equation for the implied values of the time-varying  $r^*$  at the end of each year from 2017 to 2019. Note that I cannot calculate the implied  $r^*$  for 2020 because the equation would require your unemployment rate forecasts for 2021.

The implied values for each participant's  $r^*$  projections are plotted as the blue dots in the middle-left panel, with the medians denoted by red diamonds. This analysis requires your longer-run projections. I have results for only 15 participants. As always, the diversity of your views about the outlook and appropriate monetary policy results in some dispersion of your implied estimates of  $r^*$ . The implied  $r^*$  values for the end of this year are clustered between  $\frac{1}{2}$  and  $1\frac{1}{2}$  percent, with a median value of about 1 percent. Why such a high value?

As indicated in the middle-right panel, most of you project the unemployment rate to decline somewhat further over the coming year. To bring about that unemployment outcome, the model requires a real rate gap of about minus 1½ percentage points, shown in the bottom left. With your actual real federal funds rate projections standing at around minus ½ percent at the end of this year, the implied value for  $r^*$  is thus 1 percent.

Beyond 2018, most of you project the unemployment rate to move sideways or edge up despite only modest further increases in the real federal funds rate, meaning that, by that time, policy has turned closer to neutral or even slightly restrictive, as indicated by the upward shift of the blue dots in the bottom left. Accordingly, for most of you, the value of  $r^*$  implied by your projections is ½ percent or lower at the end of 2018 and 2019 and below your longer-run values.

I don't want to oversell the results of this simple analysis, as it interprets your projections through the narrow lens of the estimated IS equation. But two points that I highlighted a year ago still seem to hold: First, your projections suggest that almost all of you view an accommodative stance of policy, as measured by a negative real rate gap, as still appropriate at the end of this year; second, most of you expect the neutral real rate to be below its longer-run value over the next two years and then to move up by only a modest amount.

As summarized in the bullets in the bottom right, the choices offered by the policy alternatives in front of you can be understood as reflecting different expectations regarding  $r^*$  and, consequently, the appropriate direction of policy. At one end, the language of alternative C emphasizes that further increases in the federal funds rate are needed soon to moderate growth in economic activity and employment to “sustainable rates in the medium term.” If you are confident in the Phillips curve mechanism reasserting itself and judge that a prolonged undershoot of the unemployment rate would risk the sustainability of the expansion, as several of you indicate in your SEP narratives, then you might want to communicate that removal of accommodation needs to proceed on a somewhat steeper path than market participants seem to be expecting. At the other end, the language of alternative A can be interpreted as expressing much less conviction that the neutral rate is in positive territory and thus is agnostic even on the future direction of the federal funds rate. If you interpret recent inflation data as suggesting that further labor market tightening is necessary to return inflation to 2 percent, you may want to indicate to the public that no change in the stance of policy is likely forthcoming anytime soon. With alternative B, you would chart a middle course. You would acknowledge that headline and core inflation have declined this year but express confidence that inflation will stabilize at your 2 percent objective over the medium term, with only modest overshooting of maximum employment while you are continuing on the path of gradual increases in the federal funds rate.

Thank you, Madam Chair. That completes my prepared remarks. The July statement and the draft alternatives are shown on pages 2 to 10 of the handout. I will be happy to take any questions.

CHAIR YELLEN. Questions for Thomas? President Bullard.

MR. BULLARD. Thank you, Madam Chair. I'm looking at the middle-left panel, "SEP-Implied  $r^*$  and Longer-Run Real Interest Rate." I'm looking at the red dots, and they're declining. The Committee-implied estimate of  $r^*$  is declining, according to this, over the forecast horizon. Is that correct?

MR. LAUBACH. I would not make too much out of the roughly 0.1 percentage point decline from 2018 to 2019. As I explained, the 2017 dots are really driven, importantly, by your expectation for a decline in the unemployment rate in the coming year.

MR. BULLARD. It's something today, and it's going to be lower in the outyears, right?

MR. LAUBACH. It's an implication of the fact that you have the unemployment gap leveling off and then actually gradually increasing, while the real rate is only very gradually rising.

MR. BULLARD. Well, it seems kind of stunning, doesn't it? Because most of us would think, you've got  $r^*$  at a depressed value and somehow return it to some normal value later on. And to have this kind of U-shaped thing is unusual.

MR. EVANS. I wanted to ask that question, but President Williams tried to get me not to. [Laughter]

MR. WILLIAMS. To no avail.

VICE CHAIRMAN DUDLEY. Madam Chair, can I ask a question? Thomas, what you're pointing out—I think I'm reading this right—is that if people actually think that  $r^*$  is rising over time, the decline in the unemployment rate that we're showing in the forecast is inconsistent with that.

CHAIR YELLEN. It should be faster than people think it's going to decline.



VICE CHAIRMAN DUDLEY. So you're pointing out the fact that maybe—assuming that the Laubach-Williams model is the right framework, and there could be alternative frameworks—it doesn't hang together as well as you would like. Is that fair?

MR. LAUBACH. Again, as I said, I don't want to oversell this analysis. This is a very simple equation, and I'm not advocating that this is an instrument that you should be using to put together your projections. It may, for example, be that, in fact, implicit in your projections is a somewhat different lag structure. In other words, the economy is a tanker that is not responding very quickly right now. There is some momentum that is still driving the unemployment rate lower, and it takes some time. You may say, "Well, maybe the stance of policy is, in fact, already not quite as accommodative as a real rate gap of negative 1½ percent," or your tightening has already had some effect, but still it takes some time before that really shows up in a leveling-off of the unemployment rate. That's one possibility.

VICE CHAIRMAN DUDLEY. Or, conversely, our tightening so far hasn't really tightened financial conditions, but we expect that it'll actually start to have some effect in the future.

MR. LAUBACH. That's right.

VICE CHAIRMAN DUDLEY. I think the staff forecast has financial conditions tightening as we go through time. Right? The dollar appreciates, and bond yields go up.

MR. EVANS. Can I try something? As I look at this, I was attracted to the lower-third panel, which seemed to get a comforting result that we almost all think that the current level of the funds rate is providing accommodation relative to some estimate of our short-run  $r^*$ . And then it's diminishing, so that seems like a good result.

You've got an analysis here that is very interesting, but, of course, it's blending different people's assessments. You're using the staff natural rate of unemployment, and every analysis has its own. So it's injecting some sort of mismeasurement in the modeling. Maybe it goes into the error, and it all is nice or whatnot. Perhaps that type of mischief would show up more in the second-row panel with dispersion and uncertainty. But this lower one is more immune to it, I hope. Certainly, the result is easier to interpret.

MR. LAUBACH. Let me just be clear on that one point. The staff's natural rate estimate, for example, shows up only in the process of estimating the coefficients in the IS equation. Thereafter, I throw it away.

MR. EVANS. I'm trying to help you, Thomas. [Laughter]

MR. LAUBACH. Thereafter, I'm using exclusively each participant's individual projections. Another point is, if you fitted this over history, there are, of course, large errors. There are transitory disturbances, and, effectively, in what I'm doing here, I'm assuming that you are not projecting any such transitory disturbances.

CHAIR YELLEN. Other questions?

MR. EVANS. Could I ask a different question?

CHAIR YELLEN. Yes, President Evans, you may. [Laughter]

MR. EVANS. We do have time, don't we?

CHAIR YELLEN. We have plenty of time. Please.

MR. EVANS. I don't want this to show up in the transcripts exactly in this fashion, but the last time we ended before five o'clock and I went downstairs, somebody didn't offer me a beverage until five o'clock. [Laughter]

CHAIR YELLEN. I meant to tell you that five o'clock is the time for happy hour.

MR. EVANS. There you have it. Okay, thank you.

MR. WILLIAMS. Remember, it takes about 10 minutes to get down there.

PRESIDENT KAPLAN. In some Latin American countries, it's after five. That didn't help. Keep going.

MR. EVANS. Here's the question. In my own commentary periodically, and I've heard it from others even today, we talk about risk analysis with regard to our outlook, and we could be running a risk that inflation might heat up in a way that we're not anticipating, and things like that. And we all have our own views on that. As I flip through the very nice and helpful staff analyses that are presented to us in terms of Tealbook B as well as in the alternative simulations, and then I look at different explanations of where things might go awry, it has embedded in it an inertial Taylor rule of sorts, so it's always going to make some kind of adjustment. But it's always amazing to me—perhaps comforting, but not really—that the inflation outlook always tends to revert back to our 2 percent objective unless we're actively going after a totally different scenario in which inflation goes up or the steeper curve kind of runs us awry.

And I wonder, in the alternative simulations, if you have any idea, if you had a different policy reaction function in which—and, of course, it would depend on what risk you were thinking about at the time. But I know that I would find some value in seeing the same simulations, but sort of saying, maybe it's the lower sleeve of the SEP funds rate path—you know, the people who were advocating being patient and seeing the risks as worse if inflation is too low, and so you do that. And so I don't have a great sense as to whether that policy shock embedded in your policy rule would lead to a surprisingly large increase in inflation or whether these things are of a magnitude such that nothing's really going to make a lot of difference.

And I do recall, over the years, periodically—I see Dave Reifschneider nicely leaning forward [laughter]—there’s been a time when, in order to goose things up a little bit more, you let inflation expectations or policy expectations respond with additional momentum. Do you ever experiment with things like that, or is there any information you could offer us to help sort through these different policy risk assessments that we all talk about, but we have our own way of thinking about it?

MR. WILCOX. I’ll just start by reporting that I feel like I need to check myself into the health unit with a broken heart. [Laughter] We fairly regularly, for example, show alternative simulations that have inflation expectations becoming unanchored and, therefore, not comfortingly reverting back.

MR. EVANS. Yes, they never get up to 3 percent. I mean, I take your point, but they almost never get up to 3 percent. They’re never of the outsized variety that really make us as nervous as this, or do they? I mean, I thought I’d been paying attention.

MR. WILCOX. Well, there is a reason for why it’s fairly hard to generate inflation that moves that high, and that reason—or at least one of the reasons—is that much of the variation in inflation that’s reflected in the confidence intervals reflects just stuff that happens—“own-equation shocks.” And so there will be a lot of variation, but at the moment, in order to get inflation moving out into the end of the tail, we do things like quadrupling the slope of the Phillips curve—

MR. EVANS. Yes, that was the one that I mentioned, that generates this—

MR. WILCOX. —having inflation expectations become unanchored, more dependent on past performance. If you get a positive shock, and then that’s allowed to feed on itself and spiral

upward. Those are the kinds of things that we need to do in order to generate higher inflation in the model.

MR. EVANS. So we have these error bands that are 70 percent, and I actually don't find nearly as much value in those as so many other people around the table, but I wonder how many times the actual scenario that we talk about ventures into those higher bands. I don't really have that great a memory of outsized exercises like that.

MR. WILCOX. I can't provide you with a tally, but we do generate scenarios that involve venturing outside the 70 percent confidence intervals. It's hard to do, particularly in the case of inflation, but it's happened.

MR. EVANS. Okay.

MR. LAUBACH. May I briefly add that the mechanism that we use when inflation expectations are no longer assumed to be firmly anchored is typically some simple form of adaptive mechanism. And if you estimate that using long samples of long-horizon survey expectations, that thing doesn't move quickly. That's, I think, consistent with the experience of the 1970s and 1980s if you try to fit it to that. It took a lot of actual inflation in order to finally push longer-run inflation expectations up. It's not easy to make these inflation expectations snap.

You invoked Dave Reifschneider earlier, and I have a vague memory that we experimented with some things, for example, that people would start learning from policy rule residual. So they would have some notion of your normal policy conduct in mind, and then, if they observed that you deviated from that, they would draw inferences from that about what your true inflation objective is. And maybe something like that could generate more volatility. But,

frankly, it's also more speculative, because we just don't know whether anyone uses, in fact, such a type of inference mechanism.

MR. REIFSCHNEIDER. I think the word there is “speculative.” We have done that, but it was sort of, “You got this sensitivity to policy expectations because you assumed it.” The historical evidence isn't really consistent with it. It's more, as Thomas said and as David was saying—and I know you already know this—that over the past 50 years, inflation expectations appeared to get unanchored over the 1960s and 1970s, but it was a slow process. And then a re-anchoring of expectations occurred over the course of the 1980s, and it required quite an action by this Committee to re-anchor them. That kind of process is a very gradual process, as least as far as the data go. This is going back to something David said. It was discussed in the memo about a year or so ago on the potential cost of undershooting. In there we, I think, got closest to what you're talking about, because we were saying that you have to go back to the dynamics of the 1970s, both on inflation expectations and on the sensitivity of inflation to shocks to real activity and things like that to generate the large inflation effects. You have to change the whole expectational process and flip back to the old dynamics to get something really moving. And the question might be, “Well, what would it take to engineer that kind of a return to the 1970s?” I don't know, but I would assume it would take quite a lot, and it would take a long period of time to do it.

And I guess the final thing I would say—related to what David said—is the 70 percent confidence intervals are wide, but even though they're kind of wide in some ways, their width is dominated by shocks that die out fast. The width isn't generated because something has a persistent effect that throws you outside a narrow range of outcomes. And so that's why, in

Tealbook scenarios, you really have to push it to get something outside the 70 percent bound. I don't know whether that helps.

MR. EVANS. Is there anything in these simulations that could help inform an analysis of whether, if you're part of the lower sleeve of the SEP's funds rate path, that's really risking oversized inflation? That's kind of what I was getting at.

MR. REIFSCHNEIDER. Right.

MR. EVANS. Or is it just going to maybe 2½ percent, in which case I think we need to have a better discussion of what we mean by "symmetry" as a Committee. That would be informative.

MR. REIFSCHNEIDER. I think you'd have to speculate. I think to do that you'd have to have the kind of analysis in which you go back and you have different regimes, different states of the world, and you say, "Oh, what would it be like in a 1970s state of the world?"

MR. EVANS. Why don't you just push policy shocks through the policy reaction function?

MR. WILCOX. It just doesn't matter that much.

MR. REIFSCHNEIDER. Right.

MR. WILCOX. I mean, you've really got to change the parameters of the inflation process. And to show how hard you have to work in order to generate an inflation surprise to the upside I think there's a really terrific scenario in the "Risks and Uncertainty" section this time around. It's called "Different Inflation Process."

MR. FISCHER. Do you have a page reference?

MR. WILCOX. The description is on page 79, and the graph is on page 82.

MR. EVANS. Yes, that's the one that generates low inflation, right?

MR. WILCOX. Right. But the point in citing that scenario is that, if you re-estimate our standard inflation relationship—I'm going to avoid using the "P" word here—over the post-2000 period, you get parameters that have an even flatter Phillips curve than we have in our standard specification. And, as you can see, what you generate on page 82 is a track for core PCE inflation in the lower left that runs a little lower than what we have.

Now, we could presumably pump monetary policy surprises, or shocks to the monetary policy rule, through a simulation long enough and hard enough to generate a material upside surprise to inflation. I myself don't actually think that exercise would be particularly helpful, because it would countenance that the Committee would somehow repeatedly ignore the evidence that was unfolding in front of your eyes.

MR. EVANS. Okay. I appreciate the lengthy discussion. I appreciate everybody being patient. I guess I'm trying to find out the message coming out of this. And so I'm coming away with the idea that when different people on either side of the table talk about a scenario where, "Boy, I think if we do this, we're going to risk inflation getting up above what we like," or "It's going to get bogged down," and I think what you're telling me is, unless you rattle your analysis in a really big way by going back and re-estimating things, things are so locked down with inflation expectations that what we're talking about just isn't really germane within the context of these analyses. Everything's pretty well contained.

MR. WILCOX. I guess, as the person who will have at least an important share of the responsibility coming back to you and saying, "Well, inflation didn't turn out like we were expecting," I'd put it a little differently myself. And that is: I think there's a very good chance that a year from now, the inflation outcome will be materially different from what we envision



today. I just can't tell you in which direction. And even *ex post*, we may well not be able to put a very convincing label on what happened.

This all goes back to a result that Bob Tetlow demonstrated probably a decade ago, which I still find very compelling. He did an analysis of variance of the inflation process and documented that, in a standard model, most of the variation in inflation doesn't come from the right-hand side variables that we talk about—things like the slack term or exchange rate depreciation, energy price pass-through into core. There's a lot of variation. Most of it comes from the error term.

MR. REIFSCHEIDER. There is a caveat to that, which gets to what you're concerned with. And I think noting it is to be fair to people who are worried about, "Something's going to come out and bite this Committee in the next five years." The caveat is: Nobody can really explain very well what happened going from the 1960s to the 1970s. Maybe you can tell a story for what happened in the 1980s about getting re-anchored. But the process of unanchoring is not that well understood. The reasons why the slope of the Phillips curve has apparently fallen so much is also not well understood. And so, in a world like that, you worry, "Well, if I can't explain something very well, something fundamental, that happened over the past 50 years, isn't there a risk that...?" It presumably has something to do with monetary policy, and it presumably, according to history, looks like it would take a while. But there's still the fact that we don't really understand what that was.

MR. EVANS. Thank you.

CHAIR YELLEN. Further questions? [No response] Okay. I think it's time to recess. There's going to be a reception starting now downstairs in the West Court Café and, following that, dinner. Unfortunately, as you know, our Martin Building cafeteria is closed, and space

downstairs is tight. But all FOMC participants and all the staff who are attending this meeting who have RSVP'd are invited to attend the dinner. We're planning another similar event on the first day of our October–November meeting, and then we will discuss and try to evaluate whether we should continue or what we should do. And, finally, we will reconvene at 9:00 a.m. tomorrow for the policy go-round.

[Meeting recessed]

**September 20 Session**

CHAIR YELLEN. Okay. Good morning, everybody. I think we're ready to get going on our policy go-round. There is just one thing I want to note—a suggestion that we can work on later. Paragraph 2 of alternative B refers to “Hurricanes Harvey and Irma,” but we have perhaps the most devastating one of all that's hitting Puerto Rico as we speak and probably doing a lot of damage. I would suggest that we change this to “Hurricanes Harvey, Irma, and Maria.” I think we ought to include that. But reactions are welcome, and we can work on that at the end if you want.

Okay. Let's begin the policy go-round. President Mester.

MS. MESTER. Thank you, Madam Chair. I support alternative B and the revised statement language. Over the intermeeting period, I heard from several people that the Committee has done an excellent job in communicating its plans for the balance sheet, and some of them haven't always given the FOMC high marks on communications. I credit Chair Yellen for driving us to this outcome, and I'm happy that the economic progress that's been made over the expansion has allowed us to begin the gradual process of balance sheet normalization.

I believe the progress on our dual-mandate goals, the medium-run outlook, and the risks to the outlook continue to support the Committee's strategy of gradually normalizing interest rates, a strategy that the Committee has been communicating for some time is appropriate. This gradual removal of accommodation gives us the best chance of sustaining the expansion. It's a balanced approach. It helps avoid a buildup of risks to macroeconomic stability that could arise if the economy is allowed to overheat, as well as risks to financial stability if interest rates remain too low and induce “search-for-yield” behavior or engender other financial imbalances, which we may not see developing. It allows us to carefully assess incoming economic

information, and it has already incorporated the kind of fluctuations we've seen in the data on the economy and inflation.

If we had started out on a steep path of normalization, we might very well have had to change strategy in response to economic developments. Instead, we've been able to keep our strategy consistent. I view this consistency as a positive and worth preserving. It underscores that we do take a systematic approach to promoting our policy goals, contrary to recent criticisms that we are too discretionary. It also removes policy ambiguity at a time when uncertainty seems to be rising on other fronts. It goes without saying that we want policy to be responsive to material changes in the outlook. But, in the absence of those changes, sending consistent messages has value, and I think we should keep this in mind. Because the gradual path of normalization does not entail an increase in the funds rate at each FOMC meeting, a pause today is still in keeping with the strategy.

One of the goals of our balance sheet communications was to ensure that the announcement would not signal a material change in policy expectations and thereby engender a sizable reaction in financial markets akin to the taper tantrum. Making the balance sheet announcement today without a change in rates and making only minimal changes in the statement language could be the best tack in avoiding sending unintended messages about policy. I can support the pause in that context. I would not want it to be read as a change from our gradual normalization strategy.

I see a couple of challenges for us in the period ahead. One challenge we face each time we pause is that we may inadvertently signal a change in our view about the economy and appropriate policy. I think we need to guard against this. At this point, market participants already have a flatter anticipated policy rate path than we do. This could prove to be a problem,

especially if financial conditions remain very accommodative and we end up having to implement a steeper funds rate path than we currently anticipate. This might seem unlikely now, but, over the past two years, the funds rate has increased 100 basis points, while financial conditions are less restrictive now than they were in December 2015. It's good to keep in mind this upside risk.

A related challenge is that the monthly data are likely to show increased variability because of the hurricanes and rebuilding efforts. So far, analysts have appropriately read through the softness in the data reports, such as retail sales and industrial production. But these readings may accumulate, so it's going to be particularly important to read through such fluctuations and keep people focused on the medium-run outlook.

At past meetings, I've expressed some concern that paragraph 1 in our statements has tended to focus too much attention on short-run movements in the data without giving proper context about what those moves mean for the outlook. While factually correct at times, changes in the description can send the wrong message. I think we've improved the language over time, but I think we need to keep attuned to what message we'll be sending in future statements in light of the expected fluctuations in the data reports in coming months. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Williams.

MR. WILLIAMS. Thank you, Madam Chair. I support alternative B with the modification that you just mentioned. While the hurricanes have created terrible loss and hardship across a wide swath of the country, our experience with previous natural disasters suggests that the hurricanes will not markedly change the medium-term outlook. The economy will continue to grow above potential, pushing the labor market further beyond full employment.

On the inflation side, we continue to fall below our longer-run objective but not by much, given the normal variability in inflation measures. Indeed, when one looks at inflation, coupled with the employment figures, we are very close to meeting our dual-mandate goals. Given these conditions, it's appropriate that we initiate normalization of our balance sheet at this meeting. I've every confidence that the launch of balance sheet normalization will go well. In large part, this is a testament to the Committee's preparation and communication.

My SEP submission calls for a federal funds rate path that is flatter than the one I had in June, as well as the Tealbook, and as well as the recommendations of the simple rules or optimal policy simulations. I've taken on board the possibility that some of the transitory factors pushing down inflation, particularly those associated with health care, may indeed prove to be somewhat more persistent, requiring more patience to bring us back to our inflation target in a timely manner. In addition, my very low estimate of  $r^*$  of ½ percent implies that monetary policy is not providing as much stimulus as might otherwise appear to be the case.

My projection involves an additional rate increase in December and three increases in 2018. And assuming that data come in as expected, a rate increase in December will maintain our policy optionality. My projected path for the economy includes a substantial overshooting of full employment, with unemployment dipping below 4 percent for a time. Therefore, while we're not "behind the curve," we shouldn't slow down the process of normalization too much, either. Thank you.

CHAIR YELLEN. Thank you. President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. I support alternative B as modified. Utilizing our balance sheet was an appropriate action during extraordinary times. But with the unemployment rate of 4.4 percent, we no longer need to rely on the balance sheet to provide

accommodation. The Committee has selected a well-communicated, gradual path that I expect will elicit no meaningful market response to the announcement today.

Successfully exiting from our large balance sheet is particularly important, because I expect this tool will be utilized again in the next recession and lessons learned from this exit will be important for determining how reluctant we should be to use the tool in the future. In addition, gradual reductions in the size of our balance sheet may provide some desired tightening in financial conditions, affecting a broad array of asset prices in a way not accomplished to date by our federal funds rate increases.

Since we began tightening in December 2015, many financial conditions—longer-term interest rates, the exchange value of the dollar, equity prices, and house prices—have remained flat or have moved in a direction consistent with monetary policy easing rather than tightening. I do not expect large reactions from financial markets. But, to the extent that financial conditions have not supported our normalization intentions, the balance sheet normalization may help nudge things in the right direction at the margin.

I am also comfortable with there being no immediate need to raise short-term rates. The uncertainty surrounding our balance sheet announcement and the recent problems created by hurricanes are good reasons to take a little time to evaluate whether these events could be more problematic. In addition, the softness in recent inflation data makes it easier to continue on our very gradual tightening path. However, embedded in my forecast is a significant risk that unemployment rates fall even further than expected to a clearly unsustainable level. The expected decline in the unemployment rate, as well as a risk with that forecast, provides justification for continuing our gradual tightening path.

Given what we know today and expect for the near future, I would favor another tightening by the end of this year, presuming incoming data unfold as anticipated. Thank you.

CHAIR YELLEN. Thank you. President Bullard.

MR. BULLARD. Thank you, Madam Chair. I want to start with my own congratulations to Stan Fischer on his retirement from the Fed. Stan may be surprised to learn that I'm his grandson. [Laughter] It happened a long time ago.

MR. FISCHER. That's the other joke? [Laughter]

MR. BULLARD. I may have forgotten a word—"intellectual" grandson. [Laughter]

MR. FISCHER. Well, you know, you're taking this story away from me. It is reported that in one Brazilian election, it was discovered that one of the candidates had an illegal son. After further work by the journalists, it got up to 11 illegal children. And then they suggested, "You should use the motto 'Vote for me—I may be your father.'" [Laughter]

CHAIR YELLEN. That's an excellent two-hander.

MR. BULLARD. As many of you know, Stan produced many students at MIT in the 1980s who later became leaders in the field. One of those, and one of the most widely published before his death, was Bruce Smith. Bruce was an important mentor of mine early in my career, and that provides my connection to Stan. However, among Stan's many students, Bruce was something of a "lost son" laboring in the wilderness of monetary theory. So I've been trying my best to hold up that tradition by being a "lost grandson" in my service with Stan here on the FOMC. So congratulations to Stan as he leaves the Committee.

Let me turn to a follow-up to President Evans's comments at the end of the day yesterday. I think I can fairly paraphrase President Evans's remarks by saying that, according to the alternative scenarios in the Tealbook, inflation outcomes are relatively benign even in rather



extreme circumstances. The idea that inflation might get meaningfully out of control, either above or below target, simply does not happen in this model. I like President Evans's comment a lot, because it's something I've wondered about myself in thinking about risk management for the Committee.

The model used to produce the alternative scenarios has a single longer-run outcome, which is stable. It can be shocked in various ways, but the variables always return to their longer-run mean values. This type of model is certainly useful for many purposes. However, a regime-based model can allow the economy to visit different outcomes for long periods of time. By building possible regimes into our models, we can more directly consider the possibility that a particular policy choice might lead to an undesirable outcome, such as inflation well above or well below target for a long period. At this point, this type of idea is experimental, but I know the staff has thought hard about some ideas that move in this direction. Further progress on this front may improve the risk-management capabilities of the Committee.

Let me turn now to some reactions to yesterday's comments on the economy. As I noted yesterday, I do not think it is wise at this point to claim that second-half real GDP growth will be any better than first-half real GDP growth. Real GDP growth in Q3 will be impaired because of the hurricane damage. The Q4 rebound is very uncertain at this point. I think the best option is to wait and see how things develop through the end of the year.

Many point to strong labor markets, but year-over-year payroll employment growth has slowed. It was 2.3 percent in January 2015, and it has ticked down pretty steadily since then to 1.45 percent, about 85 basis points over two and a half years. With the coming jobs reports, this will likely fall further.

The Committee is already saying that core PCE inflation will only be 1.6 percent year over year at the end of 2017. This is well below target and, arguably, indicates no progress in recent years. The fact that we can't claim progress means we will have to rely on the story that there's progress ahead on inflation despite continual misses to the low side in recent years. We will, in effect, be saying that inflation is just around the corner. This may hurt the credibility of our inflation target. I do not see the temporary-factor story as credible. How many exceptions are we going to make to changes in prices?

On the question of "What are the more persistent developments that are keeping inflation low?" I have three points. On Phillips-curve effects, to me, it's not a question of whether there is remaining slack in the economy. Instead, I think that the coefficient describing the feedback from unemployment to inflation has fallen meaningfully over the past two decades to the point where confidence intervals surrounding its estimated value now include zero. Therefore, I'm not expecting a lot from this channel regardless of whether you think there's a little bit more slack or not in the economy. The feedback from unemployment to inflation is just not as strong as it once was. Further, labor market adjustment seems like it is not very relevant for the future of inflation in the U.S. economy.

I'm sympathetic also to the story that technology is changing the nature of business. I've talked about that on other occasions. I do think that there may be quality adjustment issues in the price indexes that are not taken into account. That would mean inflation is even lower than what we think today, and I think this is a serious issue that we will need to address.

On inflation expectations, I think this is by far our most important variable in the current environment. I think we should change our attitude a little bit on this variable. It is not a constant. It is something, at least to me, that changes a little bit each day in response to data

developments and policy developments. Inflation expectations are currently too low to be consistent with our inflation target. In my opinion, the best measures are TIPS-based, because they do respond to current information on the economy. The habit here of citing surveys and saying that the survey measures are rock solid is, I think, not the best way to think about this variable. I don't like surveys. But even if you do like surveys, the Michigan survey's number has clearly stepped down from its previous norms, and I think it strains credulity to argue that these have not slipped.

Finally, a comment on financial conditions indexes. I asked my staff to look at this issue. We considered the Goldman Sachs Financial Conditions Index and the St. Louis Fed Financial Stress Index, along with several others. Correlations between these indexes are quite high. We asked whether any of the indexes help forecast real GDP in a VAR over the past 20 years or so. The answer is, yes, they do, but the effect is asymmetric. Periods of high stress help predict low GDP. But the reverse is not true. That is, periods of low stress are not reliably related to any particular GDP outcome. This may be one way to help interpret financial conditions indexes.

Madam Chair, for today's decision, I support a modified version of alternative B. The modification would be to use the language from paragraph 4 of alternative A and, otherwise, keep the rest of alternative B. That version of paragraph 4 strikes out the "gradual increases" clause, which I think is left over from days past and is no longer relevant to the current situation. Thank you, Madam Chair.

CHAIR YELLEN. So you're talking about the entire sentence.

MR. BULLARD. You would just import paragraph 4 from alternative A into alternative B, which means that you would strike out the clause beginning with "The Committee expects."

CHAIR YELLEN. Okay. Thank you. President Bostic.

MR. BOSTIC. Thank you, Madam Chair. Good morning, everyone. As I stated at the previous meeting and again during yesterday's economy round, a chief concern of mine has been the persistence of weak inflation numbers. Yesterday I discussed some explanations that I'm skeptical of and two other possibilities, a higher-than-understood slack in the labor market and a downward shift in inflation expectations. What these two have in common is that they suggest that we should see a lower baseline level of inflation, and they imply that the prevailing levels of inflation are not out of line.

That noted, I'm still not willing to completely let go of my basic economics training. And for this training, I owe a major extension of thanks to Stan Fischer. Like many in the room, I was influenced very early on by Stan. My first economics texts were the Dornbusch and Fischer macroeconomics books, and these inspired me to a deeper engagement in the economics field. So while I can't claim a familial relationship like President Bullard [laughter], I can join him and others in the room in offering thanks and congratulations to you, Stan. Your reach is far further than perhaps you even understand. Thank you very much.

As I was saying, I do have some basic economics training, and it taught me that very low unemployment should trigger higher wages and, ultimately, higher prices. So I'm in a kind of limbo, looking for definitive signals one way or the other. Now, I thought we were receiving clearer signals toward the end of August, but the hurricanes were a disruptive force that will distort the signal provided by data for some time into the future. As a consequence, I am willing to continue the wait-and-see attitude I've had since our previous meeting and continue this for the next few months. I'm comfortable with standing pat on the federal funds rate today but also favor one more move during this calendar year of 2017.

I'm comfortable with the language in alternative B with the hurricane amendment.

That's fine.

Regarding this meeting's other policy action, I fully support beginning the normalization of the portfolio by reducing the level of repurchasing. I believe that this is an important next step in our institution's return to historical positions from which to execute policy. If I have a criticism, it is that we could have started this sooner. But I understand logistical constraints associated with this.

Now, some might view this latter position as a conflict with my wait-and-see attitude. As a technical matter, this observation is correct. However, as I stated at the previous meeting, the pace at which we begin on this course is very slow, sufficiently so that I expect very little market reaction. This could change if we accelerate the pace of reduction or as the cumulative effect becomes larger. But for now, I'm not concerned. I will, however, be monitoring markets for any adverse reactions that may emerge. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Powell.

MR. POWELL. Thank you, Madam Chair. I will support alternative B as modified. The time has come to begin the gradual process of normalizing the size of the balance sheet. Under the Chair's leadership, the Committee has developed a thoughtful plan to do so and has carefully communicated that plan to the public. The public's reaction has so far been *de minimis*. I admit that I began this year thinking that this process risked significant unwanted tightening and that this was, therefore, probably a matter best postponed until the first half of 2018. But the fact that the plan has been developed and communicated without reaction shows that it does seem safe to proceed now, and I support doing so.

As intended, markets seem to be focused on the expected path of interest rates and not on the effects of the shrinking of the balance sheet. As long as that remains the case, those balance sheet effects may be small. However, there's an obvious tension between the official view, which seems right to me—that the balance sheet continues to provide significant support to economic activity—and the apparent reality that the reversal of QE is having little or no effect. There is still a reasonable chance that there will be a substantial reaction, perhaps at a time of more “hawkish” balance sheet news coming from one or more of the other major central banks.

The total amount of assets held by the Bank of England, the ECB, the Bank of Japan, and the Federal Reserve has increased from \$4.3 trillion to \$14.9 trillion since the end of 2007. And while much of that is unlikely ever to be reversed, nonetheless, the flows from the reversal of QE will be dauntingly large, although they're also likely to be glacially slow. However, there is there the possibility of a surprise.

If the economy continues on its current path of above-trend growth and strong labor market conditions, I could support another rate increase at the December meeting. The performance of inflation over the next 90 days will figure importantly in that decision. I see it as potentially a very close call and one not to be made today. However, my SEP submission still reflects a baseline assumption that we will choose to do another rate hike in December. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Harker.

MR. HARKER. Thank you, Madam Chair. I support alternative B at this meeting and the proposed language revisions.

I am strongly in favor of beginning the process of unwinding the balance sheet starting in October and will leave open the possibility of another rate hike this year should economic

conditions warrant it. I anticipate that they will, but I need to see more numbers like last Thursday's to be convinced that inflation is returning to target.

As I stated yesterday, the persistence of inflation below our target is, to me, the largest risk to my forecast, and I am somewhat concerned that continuing to rely on the language “transitory factors” may increasingly call our credibility in question. I'll have more to say on this subject at our next meeting after analyzing the intermeeting data releases.

I do want to comment on President Bullard's suggestion on paragraph 4. I think it is probably something that's worth discussing at a future meeting, but right now, given all of the other moving parts in the statement and the balance sheet reduction, I would not be supportive of that at this meeting. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Madam Chair. And I also want to say thank you to Governor Fischer for your service to our country. Congratulations on a job well done. I've been here for only two years, but it certainly strikes me that you're leaving this organization a stronger one than when you joined, and it's been a privilege for me to serve with you in the past two years. Thank you.

I also support alternative B with the revised language on the hurricane. I agree with President Harker—I'm not comfortable with the change proposed by President Bullard, because I actually still believe that we should be gradually removing accommodation. It's just a question of, how gradual is gradual? But we'll come back to that.

I strongly support the proposal to begin to wind down the Fed's balance sheet. And, as for the federal funds rate, while I have been consistently advocating patience, I am open-minded about the possibility of raising the federal funds rate in our December meeting. I am mindful

that if we wait too long to see evidence of greater inflation, we may well have gotten ourselves in the position of having to accelerate rate increases, which will likely lead to a recession. If we get ourselves in that position, I'm mindful of that.

I do believe that the cyclical effects of the tightening labor market are causing inflationary pressures to build. However, as I've stated, I do believe these forces are being muted by powerful structural factors. Some of them are, in fact, intensified. It's the intensification that's gotten my attention. But over the next weeks and months, I'll be carefully monitoring how these opposing forces are playing out in the economy, and I will be keeping an open mind. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Evans.

MR. EVANS. Thank you, Madam Chair. I support alternative B with the changes you suggested. It is time to begin balance sheet normalization. But when the time comes for our next increase in the federal funds rate, we should be confident that inflation is indeed moving up toward our symmetric 2 percent objective.

I think the statement sets the table well for our December decision point. For me, this will hinge on whether the inflation outlook solidifies enough to justify another increase in rates or whether the downside risks to inflation continue to dominate and thus dictate delaying the next move.

In my view, the descriptions of inflation in the statement lay out the recent facts well and give appropriate weight to concerns about the downside risks. I have to say, however, that given where things stand now, I don't expect to see enough evidence by December to justify a rate increase. The current soft underlying inflation trend just seems too entrenched, and the uncertainties are too large and too one sided.



My SEP submission has no additional rate hike this year. I do expect three rate increases in each of the next two years. I also expect the Cubs to repeat as World Series champions before I retire. [Laughter] This puts the funds rate at the end of 2019 at 2¾ percent, which is my new assumed level for the longer-run neutral rate. My SEP leaves the funds rate at neutral in 2020 even though, by the end of that year, we project inflation will be 2 percent. At 3.9 percent, the unemployment rate will be about one-half percentage point below the natural rate.

This configuration is obviously not a rest point, but it doesn't cause me a great deal of angst, either. Under this scenario, inflation probably would increase modestly above 2 percent in 2021. But given the flat Phillips curve, the amount of resource pressure we envision, by itself, is not going to generate a great deal of inflation overshooting. Instead, such an outcome may be what is needed to solidify inflation expectations symmetrically at 2 percent, which is an important foundation for achieving our inflation objective. Unless we're willing to signal that we can accept a reasonable chance of such outcomes, I don't see how inflation will ever get back to target. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President George.

MS. GEORGE. Thank you, Madam Chair. I support alternative B and welcome the initiation of balance sheet normalization as an appropriate and necessary adjustment to our policy. With respect to the timing of further interest rate adjustments, I thought yesterday's go-round highlighted the uncertainty we face about our judgments of full employment and low inflation, and we should continue to challenge our assumptions of frameworks in the interest of sustaining this expansion.

At the same time, it seems to me that we face age-old policy challenges. Obviously, moving too fast could excessively tighten financial conditions and slow the economy, and

moving too slowly could cause a tight labor market to become further stretched beyond what is sustainable in the longer run, with increasing risk of financial instability.

It's also true that our dashboard measures concerning financial stability aren't sounding alarms today, and we've seen a broad-based softening of inflation this year. But this softer inflation does not appear to be tied to weakening demand or other cyclical factors. In fact, the Tealbook projects real GDP growth to average 3 percent in the second half of 2017 and more than 2 percent in 2018, both of which are well above the longer-run estimate of trend growth. With this growth forecast, the output gap is estimated to expand to more than 2 percent by the end of 2018, and the unemployment rate in the Tealbook is projected to be 3.8 percent.

Given an outlook for economic activity well above potential in 2018, my own view is that further adjustments in the federal funds rate will be needed. If we push interest rate normalization further into the future while waiting for clear evidence of overheating and inflation, I worry it will compromise a desirable course of gradual normalization. At that point, the decision to act may be easier to justify, but it may also come at a much higher cost to the economy's longer-run sustainable growth.

I want to close, too, with thanking Governor Fischer for his service to the Federal Reserve. It's been an honor for me to serve on the FOMC with you, and I join my colleagues and the staff of the Federal Reserve Bank of Kansas City in wishing you all the best.

CHAIR YELLEN. Acting President Mullinix.

MR. MULLINIX. Thank you, Madam Chair. I join others in the room, Governor Fischer, to thank you for your service to the Federal Reserve and our nation and for the many impressive contributions you've made over the span of your career. Thank you.

My outlook for appropriate policy in the coming months has changed little from my June SEP, when I anticipated that two more rate increases this year would be appropriate. The only substantive change is that the softness of inflation persisted longer than I had expected. I attribute this largely to temporary relative price shocks, and I expect that interpretation to be borne out by the next few months of price data. Until those data arrive, I support staying put with the funds rate, but I expect that, come December, we will have sufficient evidence that it will be appropriate to raise the funds rate. Indeed, recent real activity and Thursday's CPI report are both steps in that direction.

In moving from two more increases this year to one, I'm not shifting down my funds rate path but shifting it out in time—effectively by three months. That gradually increasing funds rate path over the next two years is appropriate given that the economy seems to be operating above sustainable levels.

As for the policy statement, I support alternative B with the proposed modification to include Hurricane Maria. At the moment, I am concerned that inflation may be too low, so a policy of waiting is justified. However, assuming that the coming months reveal inflation to be within our comfort zone and unemployment continues to be low, the stage will be set to continue with our policy of gradual rate increases.

Finally, if we look back over the past 10 years, it is notable that the economy is in a position where commencing balance sheet normalization not only is appropriate, but also seems poised to generate little attention. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kashkari.

MR. KASHKARI. Thank you, Madam Chair. I prefer alternative A but can support alternative B. I actually had the same comment that President Bullard had about the language in paragraph 4, preferring not to make the reference to “gradual increases in the federal funds rate.”

I continue to monitor inflation, inflation expectations, and the unemployment rate, looking for signs that the labor force participation story is running to its conclusion. Right now, I’m mostly focused on inflation, where we are far from target. As we’ve discussed, core inflation is low at 1.4 percent. It’s been persistently low for six months, and it does not appear to be transitory, especially given low global inflation, which we discussed yesterday.

My view is that low inflation reflects a mix of remaining slack coupled with low inflation expectations. Given this diagnosis, I think it is appropriate policy at this point to remain accommodative until inflation returns to target. In my view, we should hold off on any further increases in the federal funds rate until we’ve reached our inflation goal of core PCE at 2.0 percent on a 12-month basis unless we see a large further decline in the headline unemployment rate, suggesting that slack has been used up, or evidence of inflation expectations starting to drift higher, which we’re not seeing right now.

To me, maintaining accommodation will support economic growth, which will help reduce slack, which will eventually increase wage and inflation pressures. Signaling a firm commitment to our symmetric inflation target will also help support inflation expectations. If we instead—this is about the language—continue to signal that the federal funds rate is on a gradual upward path, I fear that inflation will continue to drift sideways and we risk expectations becoming unanchored downward.

At the previous meeting, I mentioned I was trying to rethink how I was approaching the SEP, and I tried my best not to rely on the Phillips curve. But I couldn’t get there. At the end of

the day, I do believe that a tight labor market eventually should lead to higher wages and higher inflation. So, what I've done—I'm SEP submission number 5—I have no increase in the federal funds rate this year or next year until I reach some view that slack is being used up. That is sometime in 2019.

Finally, I do support starting our plan for balance sheet normalization in October. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Brainard.

MS. BRAINARD. Thank you, Madam Chair. The proposed change to our reinvestment policy today should amount to a material removal of accommodation over time and comes on top of three increases in the federal funds rate since last December. In assessing the appropriate future settings of the funds rate, I will be looking carefully at the evolution of inflation. We've been falling short of our inflation objective not just in the past year, but over a longer period as well, and standard monetary theory suggests that we shouldn't return fully to the neutral rate of interest until we're confident inflation is on track to achieve our target.

The models that I and others monitor suggest the short-run neutral rate is currently around zero in real terms. That's also the view of outside analysts, as we saw in the primary dealer and market participant surveys conducted by the Federal Reserve Bank of New York. Adding in a trailing core PCE inflation rate of only 1½ percent suggests that the present setting of the nominal funds rate may be only slightly below its current neutral level. So unless we expect inflation to move quickly back to target or there are indications that the short-run neutral rate has moved up further, it appears we could approach neutral without too much additional work.

As I talked about extensively yesterday, there are good reasons to believe inflation will not move quickly back to target. Today, let me touch briefly on  $r^*$ . It's possible that the short-run neutral rate has moved up. The unemployment rate has fallen over the past year, and staff estimates of the output gap have moved further into positive territory. At the same time, interest rates have been rising, and that does, together, suggest an increase in  $r^*$ . But, as I noted earlier, the models that we tend to monitor suggest a relatively low value for  $r^*$ . And because we're falling short of our inflation objective, it seems appropriate that real interest rates be set below that level.

That said, the future evolution of  $r^*$  will bear close monitoring. In the staff's medium-term projection,  $r^*$  rises well above its longer-run equilibrium value. That occurs despite balance sheet normalization, which the staff estimates will boost the level of the 10-year term premium by about 30 basis points between now and the end of 2020. Various staff estimates suggest that such an increase in term premiums would imply a decrease in the short-run neutral rate of interest. And if, as I anticipate, the ECB or other foreign central banks decide to pursue a similar course before too long, this could also have a reinforcing effect. Of course, if the neutral rate remains low relative to its historical averages, this puts a greater premium on guiding inflation back up to target so as to retain space to buffer against adverse shocks with conventional policy.

For these reasons, in the months ahead I'll want to see data that allow me to be more confident that core inflation is indeed on track to move up to our target.

Finally, I endorse the proposal in alternative B to announce, at the end of this meeting, the change in reinvestment policy we agreed upon in June, with the implementation to begin next month. I want to take this opportunity to congratulate the Chair for her exceptionally deft

management of the balance sheet normalization process. This is virtually uncharted territory for the FOMC, and the very clear, well-communicated, and carefully considered approach that she has led will, I believe, provide a model for peer central banks to build on in years to come.

Thank you.

CHAIR YELLEN. Thank you. Governor Fischer.

MR. FISCHER. Thank you, Madam Chair. This is a big day in the history of the Fed's policy approach to the Great Recession and the great financial crisis—the beginning of balance sheet normalization and the exit from QE. And because we've already had two "greats," I learned this morning from an NPR program that this is now called the "great unwinding." So that's where we are.

At the same time, we need to decide on today's step on the road to our target of 2 percent inflation and full employment. The normalization program was described in the FOMC's Addendum to the Policy Normalization Principles and Plans in June. And, on the assumption that the longer-run level of reserve balances will be \$500 billion, we'll have normalization by the third quarter of 2021, with a balance sheet of about \$3 trillion. The current Tealbook B contains a detailed explanation of the expected dynamics of the Fed's balance sheet and income, along with projected remittances of earnings to the Treasury through 2030.

Normalization will reverse the QE that the FOMC undertook between 2008 and 2014 and is, therefore, likely to be contractionary. One guess could be that the interest rate effect will be the opposite of the calculated expansionary effect of the original QE programs that produced the increase in the balance sheet. But that is unlikely to be accurate as of today, for the beginning of normalization has been expected for some time and must already have had an influence on

interest rates. Hence the common view that normalization will have smaller absolute effects on interest rates than did the corresponding QE.

The Chair has emphasized that, once normalization gets under way, we will, to the extent possible, leave the process to proceed on automatic pilot. The thoroughness of the preparations for normalization and the intelligent design of the program—for which the staff and relevant members of the Federal Reserve’s management, notably the Chair, deserve commendation—make that a strong possibility. But just in case, you can be sure that the potential automatic pilot will be closely monitored and tended to, if and when unexpected difficulties arise. It is in good hands.

Turning next to today’s interest rate decision, I support alternative B. And, because I won’t be around to say it later, let me say now that I expect that if the economy continues on its current path, there will be one more increase in the federal funds rate this year.

Now, back to yesterday’s discussion of why inflation has been so low and what we can do about it. Let me confess first that I would have preferred that the inflation target had been set as a range, which, in the case of the United States, strikes me should have been 1.5 to 2.5 percent. But at the moment, we’re stuck with 2 percent. I’ve argued elsewhere that we need a mechanism that would make it easier to move the target inflation rate without causing a significant loss of central bank credibility. But I’m not sure that such a mechanism exists. Canada has a law that permits the government to change the inflation target, and the U.K. practice allows the Chancellor of the Exchequer to set the Monetary Policy Committee’s target inflation rate. Nonetheless, the target rate is 2 percent almost everywhere, except countries that are approaching that number from above, and has hardly, to my knowledge, been changed.



Hence, I conclude that the best that could be done is to move from a fixed numerical target to a target range.

Such a mechanism has been proposed in the exchange rate literature and, if it becomes credible, can begin to work in a self-reinforcing way, which is something I found in my previous job. But whether this Committee should pursue such a path is uncertain, for the potential failure of the approach would exact a cost in terms of our credibility. The optimal approach is probably to continue with the present course of action, hoping that the inflation rate will move closer to its 2 percent target in the next year or two with the support of wage increases induced by an ever-strengthening labor market.

Will that happen? Probably. Experience suggests that basic economic mechanisms do eventually begin to work—typically, significantly after they should have begun to work. And the wage–price mechanism is basic. If they do not work, the Federal Reserve will have to come up with another approach. At the same time, in light of that possibility, it would be useful for the staff to try to understand why inflation—the uninvited guest to many a party—has been so difficult to attract to this one and to seek methods of encouraging it to join the party, but for just a short while.

There were many attempts yesterday to explain what has happened to the Phillips curve. Sitting around this table, especially when we’ve had builders and other industrialists in the visiting delegation, I’ve been struck by both their frequent complaints that skilled workers are hard to find and their polite refusals to answer the question of why they do not raise wages. One feels that they are stuck in a low-wage-increase equilibrium that they are scared to disturb for fear that their raising their wages may be contagious. The increasing concentration of many industries in the United States is probably also contributing to this possibility.

It is often said that nominal wage increases are lower than they were in past decades, because productivity increases are lower than they used to be. At the same time, many economists and non-economists believe that the productivity data must be wrong—because the mobile phone revolution is so striking and it, surely, is making us all better off. Well, despite the valiant work of some of our colleagues, that possibility is hard to prove. For one thing, it doesn't show up in the data on wage increases.

What about expectations? I confess to wondering whether the fact that we have, by and large, succeeded in establishing 2 percent as the expected rate of inflation a few years down the road in many of the advanced countries has fundamentally altered the Phillips curve tradeoff. And I also wonder what that means for the effect of macroeconomic policies.

Or it may be, as was said yesterday, that the experience of living through the Great Recession and the Global Financial Crisis has persuaded workers that it's more important to have the certainty of a job than to have an additional percent or two increase in the wage that more militancy might produce. Well, you can say that. But, on the other hand, the rate of leaving jobs has gone back to levels close to what they were before the great financial crisis.

I think it's clear that if it wasn't for the ELB, or if we learned better how to manage negative interest rates, a low or even negative rate of inflation might be acceptable to the general public and manageable by the central bank, now that we know what quantitative easing is and how to manage it. But even so, I find it hard to believe that the United States will ever be ready to accept negative interest rates. So the mystery remains. I look forward to discovering how it will be resolved—quite possibly by some of the extremely skilled people sitting around this table and in the audience today and, more likely, by the passage of enough time for the basic Phillips curve mechanism to begin eventually to work.

I'd like to conclude on a personal note. I greatly appreciate the very kind words directed at me during this FOMC meeting. Of course, they remind me of a question: What's the difference between a farewell oration and a farewell speech at a retirement? The answer: At a funeral, no one believes the speech. At the retirement, there's at least one person who believes everything that's being said. [Laughter] I count myself as very lucky to have been offered the Vice Chairmanship of the Federal Reserve Board, and for that I thank President Obama, who nominated me, and the Chair, who persuaded me to accept the offer before the President offered it. [Laughter]

I am grateful for many reasons—not only for the opportunity to work in the most important central bank in the world, but also for the opportunity to meet so many decent people going about their work with the utmost seriousness, but not taking themselves too seriously, and to become friends with many of them. I will not name anyone at this stage, because I've been told I have to come back for my official departure party. But, to all of you, let me say thank you for your kind words, and thank you for our cooperation over the short three and a half years I've been at the Fed. May all of you continue to do at least as well personally and professionally as you have done in recent years, and please continue to keep this central bank operating at the remarkably high level it does.

Finally, remember: complacency must be avoided. And so long as the current Chair continues sitting in her chair, complacency will be avoided. Thank you, all, and farewell.

[Applause]

CHAIR YELLEN. Thank you, Stan. Vice Chairman.

VICE CHAIRMAN DUDLEY. Well, you're a tough act to follow, Stan. I can't say the words with as much grace and humor and dignity as you can, but I think I do want to echo the

Chair's remarks and the other Committee participants' remarks over the past two days and thank you for your contributions that you've made to this Committee, to the Federal Reserve, and to the economics profession over your long, illustrious career. There really is no one quite like you in terms of the breadth and magnitude of your achievements in academia, the World Bank, the IMF, the Bank of Israel, and here at the Federal Reserve Board as Vice Chairman. The saying "You are a gentleman and a scholar" is often used lightly and in jest, but in your case, it truly applies. The Internet dictionary I referenced says the saying means someone who is admirable and of high esteem. That is you in spades, and I know my sentiments are shared by all of us at the FOMC, around the Federal Reserve System, and among our central bank colleagues whom you and I have had the pleasure of meeting so regularly in Basel over the years.

MR. FISCHER. Well, thank you.

VICE CHAIRMAN DUDLEY. Let me turn to the more boring issue of alternative B. [Laughter] I support alternative B with the Chair's modification.

I agree with everyone else on the Committee that it's time to begin the balance sheet normalization process, and I'm really pleased that everyone on the Committee supports this. That's really a remarkable achievement. The process of raising the federal funds rate target range, in my view, is indeed well under way. And the prospects are good that the economic expansion will continue over the medium term, so the risk of a near-term reversal in our monetary policy path seems low at this point. Finally, it's widely anticipated that we'll start the process in October, and there's been little market reaction as expectations have shifted in terms of timing. In addition, the debt limit issue has been put to bed for a while, so there basically are no compelling reasons for delay at this point, and I think that we all share those sentiments. I view this shift as a major milestone even as the balance sheet normalization process is

anticipated to run on autopilot, in the background. The plan will normalize the balance sheet over time but with appropriate safeguards to minimize the risk of a sharp disruption to financial markets.

Now, one issue that I have been wrestling with is the lack of response of the U.S. Treasury market and the agency MBS market as expectations have changed about the timing of balance sheet normalization. If expectations matter, why haven't bond term premiums risen and the agency MBS–Treasury option-adjusted spread widened as balance sheet normalization has become more likely? I find it hard to reconcile the taper tantrum experience with what we're seeing currently. I think there are a number of competing explanations to account for the lack of movement in Treasury yields and the agency MBS option-adjusted spread to Treasury securities. Some of these explanations suggest that the widening in risk premiums maybe had just been delayed. Others suggest that the widening will be smaller than we might have anticipated.

On the side that the widening in term premiums will be smaller than anticipated, market participants do give us credit for good communication, and that stands in sharp contrast to the taper tantrum episode. I think this has helped. Also, the term premium may be permanently lower than has been the case historically. Over the past 50 years or so, the average spread between the 10-year Treasury note yield and the 3-month Treasury bill yield has been about 100 basis points. But if inflation risks are viewed as much reduced, might not this have a persistent effect on the level of term premiums?

Finally, most likely, our balance sheet is going to remain considerably larger than when we started to expand our balance sheet in 2008. If our actions depressed 10-year Treasury note term premiums by, say, 50 to 100 basis points as the balance sheet rose from \$800 billion to \$4½ trillion, then it should widen by much less as the balance sheet falls to only around \$3 trillion to

\$3½ trillion. I'm assuming here that the FOMC ultimately decides on a monetary policy framework with a large amount of excess reserves—in other words, a floor system.

Or it's possible that the upward pressure on term premiums could just be delayed. Undoubtedly, the continuing European and Japanese asset purchase programs are helping restrain our bond term premiums. Perhaps when these programs wind up, we'll see more widening in bond term premiums on a global basis. Also, it could be that flows matter more than shifts in expectations. In other words, only when the additional supply hits the market will it have a significant consequence for yield levels and term premiums.

Finally, the timing of balance sheet normalization in terms of large supply effects may simply be so far out in the future that it's not now the focus of market participants or yet priced into the bond market. This is consistent with the June Desk surveys, in which market participants generally viewed the impending shift in the Fed's balance sheet as not yet having any effect on the level of term premiums.

How much term premiums widen and when this occurs is, I think, important in terms of thinking about the appropriate stance of monetary policy. Wider term premiums would represent a tightening of financial conditions, all else being equal. The more the term premium widens, all else being equal, the less we'll have to raise short-term rates. Right now, at least, there's been no widening. Thus, as matters stand today, that bolsters the case for further monetary policy tightening. But circumstances could change as the balance sheet normalization process gets under way in earnest, so that may have effects on our future monetary policy decisions. Thank you, Madam Chair.

MR. FISCHER. Madam Chair, can I ask a question?

CHAIR YELLEN. Yes.

MR. FISCHER. If interest rates are going down, what do we know about the utility functions in the markets? I'd think that there's a good shot that they're logarithmic and that what's constant is the log of the term premium and not the term premium itself. We're going to be operating with significantly lower interest rates as far as the eye can see. We measure it in basis points, don't we? I think we might want to measure it as a percentage of something.

VICE CHAIRMAN DUDLEY. Yes, I mean, the point I was making is, if inflation is low and inflation is less volatile, the big risk of holding long-dated assets is that inflation rises. So we may be in a regime of permanently lower term premiums.

The other story that we hear from market participants is that there's a demand for safe assets, to guard against reversals in the economic environment, that is raising the value of Treasury securities. They're more worried about the downside risk to the economy than they are worried about the upside risk to inflation. So that changes the relative attractiveness of longer-dated Treasury securities. Hard to know.

CHAIR YELLEN. Okay. Well, I've heard broad-based support for alternative B and the initiation of our balance sheet program today. Before we vote on the statement, I want to discuss President Bullard's suggestion a little bit more. President Bullard and President Kashkari, I heard, supported a change to paragraph 4—essentially substituting the alternative A version—and I have heard some opposition, but many of you didn't comment.

I would say that, from my own standpoint, essentially removing that language gets rid of any expectation that the Committee has expressed for a long time that the path will be one of gradual rate increases. That's an extremely significant change, not a minor change, to alternative B, and I do find it a strange time to make such a change when the SEP continues to show that most participants have an unchanged path that they expect for the federal funds rate of further

gradual increases. So the language is consistent with the median path. There's not been much change in the SEP this time. And while I was pleased to hear a lot of open-mindedness about future policy—which I think is fully appropriate—and concern about inflation and open-mindedness in terms of watching the data, the SEP does suggest that most of us do think that inflation is going to rebound, although, obviously, it's a hypothesis we'll be reevaluating in light of the data. I would say, from my own standpoint, I would have concern myself about making the substitution that you've proposed. But I do want to let anyone else who wishes to weigh in, especially if anyone else wants to support the change. Vice Chairman.

VICE CHAIRMAN DUDLEY. Yes, Madam Chair, I agree with you. I think if it wasn't in, you wouldn't have to put it in. But if it's in, I think it sends a very strong signal if you take it out. Taking it out, I think, would be confusing to people. I think they'd be having trouble reconciling the two. They'd say: "Why are you taking it out at this meeting, when your SEP forecasts have really fundamentally not changed?"

CHAIR YELLEN. There would be that. President Bullard.

MR. BULLARD. Madam Chair, I appreciate your comments, and I think if I was in your chair, I would agree with that. [Laughter] But I'm not. I think that I would like the Committee to think about this, especially Governor Brainard's comments about where  $r^*$  is, how fast do you think  $r^*$  is going back, and how close are we to  $r^*$  right now? I think there was a time when this language was put in where we thought that the policy rate was quite a bit below  $r^*$ , and, therefore, we said that this gap has got to be gradually closed. But since then, President Williams and Thomas Laubach have convinced us that  $r^*$  is quite a bit lower than we thought, plus we've raised the rate. This gap has become pretty low, and I'm wondering if it's really



appropriate now to continue to say that we've got a long path of gradual rate hikes. I agree about your SEP comment, though.

CHAIR YELLEN. From my own standpoint, point well taken, and I think I agree also with what the Vice Chairman said, which is, this isn't language I would propose to put in today if it wasn't already there. I do think it's worth a rethink at an appropriate time, especially if we determine in light of data that a more gradual path than we're anticipating—in light of inflation data, perhaps—becomes what we expect. I do think it's something we should rethink, but I wouldn't want to make the change today. And if anyone wants to express support, please do.

[No response] Okay. Seeing none, then let me ask Brian to call the roll.

MR. HARKER. Madam Chair.

CHAIR YELLEN. Oh, yes.

MR. HARKER. One other just minor suggestion. I would recommend, instead of naming another hurricane, just saying "hurricanes." Now, why? Because Jose, even though it's a minor hurricane, may do damage from Cape Cod to Cape May. People there may say, "What about us?" because it's still spinning off the East Coast.

MR. POWELL. I agree.

MR. HARKER. So instead of adding another name, just say "hurricanes," and people will know what we mean.

MR. POWELL. I agree with that. "Recent hurricanes."

VICE CHAIRMAN DUDLEY. Could just say "recent hurricanes."

CHAIR YELLEN. So will we say "recent hurricanes have devastated"?

MR. HARKER. Yes.

VICE CHAIRMAN DUDLEY. Yes, I'm not sure if Jose fits the class of devastation.

MR. HARKER. No, no, but to those communities, it's going to cause disruptions.

MR. ROSENGREN. I'll tell you when I land in Boston.

CHAIR YELLEN. Okay. So, is everybody okay with "recent hurricanes"? Loretta.

MS. MESTER. I thought of that, but the reason I thought the way you worded it was better was that it acknowledges that one of them is hitting Puerto Rico.

CHAIR YELLEN. Yes.

MS. MESTER. And I thought that if we just say "hurricanes," it still might guide people into thinking that all we're caring about are the two that hit the U.S. mainland. That's the nuance, but I just put it out there.

VICE CHAIRMAN DUDLEY. Yes, I'm where Loretta is.

CHAIR YELLEN. That was, in part, a motivation to name it.

MR. KASHKARI. There's a flipside. I mean, people might say, "Why does the Committee know something about future devastation?" I just feel like we're getting a little bit ahead of ourselves with the hurricane that's ongoing right now.

VICE CHAIRMAN DUDLEY. Well, it's hitting Puerto Rico as we speak. So we're pretty sure. I mean, it's a Category 4 hurricane. I don't think there's that much forecasting required to understand it's going to cause a lot of damage.

MR. KASHKARI. For what it's worth, I was where Pat was. The "recent hurricanes" just felt like it acknowledged the devastation without getting overly specific.

MR. BOSTIC. I agree with Pat as well.

CHAIR YELLEN. With "recent"?

MR. BOSTIC. Yes, "recent hurricanes."

CHAIR YELLEN. Okay. Let’s take a straw poll. How many people prefer “recent”?

[Show of hands] Okay. And how many people prefer the listing? [Show of hands]

VICE CHAIRMAN DUDLEY. You had to have some controversy.

MR. POWELL. Chair’s call.

MS. GEORGE. I think you should make the call.

MR. HARKER. Yes, sorry to bring it up.

CHAIR YELLEN. Stan.

MR. FISCHER. There is a compromise, which is “recent hurricanes, among them Irma, or whatever.”

CHAIR YELLEN. Well, it seems like it’s a tie.

VICE CHAIRMAN DUDLEY. The tie goes to the Chair.

CHAIR YELLEN. I guess I would stick with the listing—the “Hurricanes Harvey, Irma, and Maria.” It’s a close call. I wouldn’t be unhappy with “recent,” either, but let’s stick with the listing.

CHAIR YELLEN. Okay. Brian.

MR. MADIGAN. Thank you, Madam Chair. As you noted, this vote will be on the monetary policy statement for alternative B, as shown on pages 5 and 6 of the package of materials for Thomas Laubach’s briefing on monetary policy alternatives, except that the second sentence of the second paragraph would begin with “Hurricanes Harvey, Irma, and Maria.” The vote will also encompass approval of the directive to the Desk included in the draft implementation note on pages 9 and 10 of those briefing materials.

Chair Yellen	Yes
Vice Chairman Dudley	Yes
Governor Brainard	Yes
President Evans	Yes

Governor Fischer	Yes
President Harker	Yes
President Kaplan	Yes
President Kashkari	Yes
Governor Powell	Yes

Thank you.

CHAIR YELLEN. Now the Board needs to vote on corresponding interest rates on reserves and discount rates. I first need a motion from a Board member to leave the interest rates on required and excess reserve balances unchanged at 1¼ percent. Do I have a motion?

MR. FISCHER. So moved.

CHAIR YELLEN. Second?

MR. POWELL. Yes, second.

CHAIR YELLEN. Without objection. Finally, I need a motion from a Board member to approve establishment of the primary credit rate at the existing rate of 1¾ percent and establishment of the rates for secondary and seasonal credit under the existing formulas specified in the staff's September 15 memo to the Board. Do I have a motion?

MR. FISCHER. So moved.

CHAIR YELLEN. Second?

MR. POWELL. Second.

CHAIR YELLEN. Thank you. Without objection. Okay. Thank you. And our final agenda item is simply to confirm that our next meeting will be on Tuesday–Wednesday, October 31 and November 1. As usual, there will be boxed sandwiches and salads in the anteroom.

MR. POWELL. It's early.

CHAIR YELLEN. And if anybody will be around still at 2:30 and wants to watch me get decimated in the press conference [laughter], there'll be a TV down there. Enjoy the spectacle. I'll do my best and look forward to seeing all of you at the next meeting.

END OF MEETING