Meeting of the Federal Open Market Committee on November 7–8, 2018

A joint meeting of the Federal Open Market Committee and the Board of Governors was held in the offices of the Board of Governors of the Federal Reserve System in Washington, D.C., on Wednesday, November 7, 2018, at 1:00 p.m. and continued on Thursday, November 8, 2018, at 9:00 a.m.

PRESENT:

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

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

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

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

David Altig, Thomas A. Connors, Trevor A. Reeve, Ellis W. Tallman, William Wascher, and Beth Anne Wilson, Associate Economists

Simon Potter, Manager, System Open Market Account

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

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

Matthew J. Eichner,[1] Director, Division of Reserve Bank Operations and Payment Systems, Board of Governors; Michael S. Gibson, Director, Division of Supervision and Regulation, Board of Governors; Andreas Lehnert, Director, Division of Financial Stability, Board of Governors

Daniel M. Covitz, Deputy Director, Division of Research and Statistics, Board of Governors; Rochelle M. Edge, Deputy Director, Division of Monetary Affairs, Board of Governors; Michael T. Kiley, Deputy Director, Division of Financial Stability, Board of Governors

Jon Faust, Senior Special Adviser to the Chairman, Office of Board Members, Board of Governors

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

Brian M. Doyle, Joseph W. Gruber, Ellen E. Meade, 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

Eric M. Engen, Senior Associate Director, Division of Research and Statistics, Board of Governors; Christopher J. Erceg, Senior Associate Director, Division of International Finance, Board of Governors

Edward Nelson, Senior Adviser, Division of Monetary Affairs, Board of Governors; S. Wayne Passmore, Senior Adviser, Division of Research and Statistics, Board of Governors

William F. Bassett, Associate Director, Division of Financial Stability, Board of Governors; Marnie Gillis DeBoer[2] and David López-Salido, Associate Directors, Division of Monetary Affairs, Board of Governors; Molly E. Mahar,[2] Associate Director, Division of Supervision and Regulation, Board of Governors; Stacey Tevlin, Associate Director, Division of Research and Statistics, Board of Governors

Jeffrey D. Walker,[1] Deputy Associate Director, Division of Reserve Bank Operations and Payment Systems, Board of Governors; Min Wei, Deputy Associate Director, Division of Monetary Affairs, Board of Governors

Christopher J. Gust, Laura Lipscomb,[2] and Zeynep Senyuz,[2] Assistant Directors, Division of Monetary Affairs, Board of Governors; Patrick E. McCabe, Assistant Director, Division of Research and Statistics, Board of Governors

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

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[1] Attended through the discussion of developments in financial markets and open market operations.
[2] Attended through the discussion of the long-run monetary policy implementation frameworks.
[3] Attended Wednesday session only.

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

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

Alyssa G. Anderson[2] and Kurt F. Lewis, Principal Economists, Division of Monetary Affairs, Board of Governors

Joshua S. Louria,[2] Lead Financial Institution and Policy Analyst, Division of Monetary Affairs, Board of Governors

Sriya Anbil,[2] Senior Economist, Division of Monetary Affairs, Board of Governors

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

Andre Anderson, First Vice President, Federal Reserve Bank of Atlanta

Jeff Fuhrer, Sylvain Leduc, Kevin Stiroh,[4] Daniel G. Sullivan, and Christopher J. Waller, Executive Vice Presidents, Federal Reserve Banks of Boston, San Francisco, New York, Chicago, and St. Louis, respectively

Paolo A. Pesenti, Paula Tkac,[2] Luke Woodward, Mark L.J. Wright, and Nathaniel Wuerffel,[2] Senior Vice Presidents, Federal Reserve Banks of New York, Atlanta, Kansas City, Minneapolis, and New York, respectively

Roc Armenter,[2] Satyajit Chatterjee, Deborah L. Leonard,[2] Pia Orrenius, Matthew D. Raskin,[2] and Patricia Zobel,[2] Vice Presidents, Federal Reserve Banks of Philadelphia, Philadelphia, New York, Dallas, New York, New York, respectively

John P. McGowan,[2] Assistant Vice President, Federal Reserve Bank of New York

Andreas L. Hornstein, Senior Advisor, Federal Reserve Bank of Richmond

Samuel Schulhofer-Wohl, Senior Economist and Research Advisor, Federal Reserve Bank of Chicago

Gara Afonso,[2] Research Officer, Federal Reserve Bank of New York

Transcript of the Federal Open Market Committee Meeting on
November 7–8, 2018

November 7 Session

CHAIRMAN POWELL. Good afternoon, everyone. As usual, today's meeting will be conducted as a joint meeting of the FOMC and the Board, and I'll need a motion from a Board member to close the meeting.

MR. CLARIDA. So moved.

CHAIRMAN POWELL. Second?

MS. BRAINARD. Second.

CHAIRMAN POWELL. Without objection. At our previous meeting, we congratulated Mary Daly on her appointment as president of the San Francisco Fed. I'm very happy, and I know we all are, to have her join us today at the Board table. So I would ask you to join me again in welcoming Mary aboard as president. [Applause]

And with that, let's turn to our first agenda item, which is a comparison of our current system with abundant reserves with a system founded on reserves scarcity that we used before the crisis. This is a topic we've returned to over time on a fair number of occasions. What's new this time is that money market developments and our own ongoing balance-sheet reduction program suggest that it is time for the Committee to move toward decisions, as well as to show our deliberation process transparently to the public.

Today we're also going to consider various market interest rates that we could target in different operating regimes, and depending on our discussion today, we'll continue that discussion in December. Also in December, we plan to have another special briefing on the operating framework, which will include a discussion of issues related to the balance sheet.

So now let's turn to the staff briefings, which will be presented by Patricia Zobel, Sam Schulhofer-Wohl, Zeynep Senyuz, and Brian Doyle. Patricia, would you like to begin?

MS. ZOBEL.[1] Thank you, Mr. Chairman. We are pleased to present on the long-run framework today. We have four short presentations. I'll start with the demand for reserves. Sam Schulhofer-Wohl will discuss choice of operating framework, Zeynep Senyuz will talk about target rates, and Brian will update us on the foreign experience.

Since the financial crisis, the U.S. and most other major economies have operated in monetary policy frameworks that feature a high degree of reserve abundance. Through this experience, we have learned a great deal about how monetary policy and financial markets function in the presence of abundant reserves. However, understanding the shape of banks' demand curve for reserves was not essential for policy implementation in this environment. Now, as reserve levels come down and we consider operating in regimes involving lower overall reserves, understanding the demand for reserves is an important consideration. As shown in panel 2 of your first exhibit, the banking system's level of reserves is currently well below the peak level of $2.8 trillion in 2014 and is projected to fall further in 2019.

Over this same period, commercial banks' liquidity management practices have changed markedly. Pre-crisis, banks—large and small—managed their balance sheets with very low levels of reserves. They held reserve balances primarily in order to meet daily payments flows and reserve requirements. They relied heavily on interbank borrowing and intraday credit as means of offsetting payment shocks. In contrast, large banks today hold substantial liquidity buffers, composed of high-quality securities and reserves, in order to meet potential outflows and to comply with regulatory requirements. Over the past year, the staff undertook outreach to banks and conducted a Senior Financial Officer Survey to gain insight on banks' reserve management practices.

At a high level, as depicted in panel 3, we learned that there is now significant heterogeneity in how banks approach reserve management. Whereas small banks still cite traditional factors—such as reserve requirements and payment flows—as driving minimum reserve levels, the largest banks and foreign banking organizations now also suggest that internal liquidity stress tests are important drivers of minimum desired holdings. These stress tests do not prescribe reserve levels; however, insofar as banks project outflows to occur over defined periods that exceed their ability to sell securities or finance them in the repo market, they may face a need to hold precautionary reserves. In our outreach, we found that banks citing these factors varied widely in their statements of their desired minimum reserve levels—likely reflecting the business-specific nature of these requirements.

[1] The materials used by Ms. Zobel, Mr. Schulhofer-Wohl, Ms. Senyuz, and Mr. Doyle are appended to this transcript (appendix 1).

At the current level of rates relative to IOER, banks report that their reserve demand is likely much lower than the current level of reserves in the system, but higher than its pre-crisis level. Scaling up survey responses to the system level suggests that the aggregate minimum level of reserves could be roughly $800 billion, although the staff assesses there is considerable uncertainty associated with this figure. Notably, as shown in panel 4, this represents less than half of the current aggregate level of reserves.

The staff have still been monitoring money market activity and other data for signs that some banks have unmet reserve needs or are actively seeking reserves in money markets. As noted in panel 5, in the federal funds market, we have seen a reduction in IOER arbitrage activity by FBOs and a slight increase in bank borrowing above IOER; however, we have not seen broad-based pressures or signs that banks' reserve needs have risen. In the period ahead, as reserve levels continue to decline, we could see transitory money market pressures as reserves are redistributed across the banking system, even if the point of ultimate scarcity has not been reached. The staff will continue to monitor conditions.

The survey asked banks not only about their reserve demand in the current environment, but also how they would react to different environments, such as ones in which reserves are remunerated at levels significantly below money market rates. As shown in panel 6, the responses suggested that, in the short run and at spreads up to 50 basis points, banks would not reduce their minimum levels of reserves by a large amount. However, banks themselves were not really certain how they would respond in such an environment. Faced with such costs over an extended period of time, they would likely adjust business models and funding profiles to reduce, at least to some degree, their need for reserves. So we caution against reading too much into the shape of this curve.

How banks' reserve management practices will evolve is an important consideration for the choice of long-run operating framework. Whether reserve demand could be, with sufficient incentives, adequately stable and predictable to estimate on a high-frequency basis has implications for the best mode of interest rate control. And the degree to which banks would respond to a higher opportunity cost of holding reserves by changing their reserve management practices could be one factor influencing overall reserve levels. Although outreach has provided valuable insight on how banks manage their reserves, we don't have perfect visibility regarding how this would evolve.

So, with that, I'll pass it over to Sam to discuss operating regimes.

MR. SCHULHOFER-WOHL. Thank you, Patricia. A key choice in selecting an operating regime is whether to supply limited excess reserves and operate on the steep part of the demand curve for reserves or to supply abundant excess reserves and operate on the flat part of the curve. Your second exhibit compares these two types of regimes along various dimensions. Let me highlight a few of them.

First, the two types of regimes differ significantly in how they control interest rates. In a regime of limited excess reserves, the Federal Reserve would make small changes in the supply of reserves, so that supply would meet demand at the target interest rate. This technique worked well before the financial crisis, when the demand for reserves was stable and shifts in autonomous factors that affect the supply of reserves were modest. However, as Patricia discussed, the sources of reserve demand have fundamentally changed, creating uncertainty about whether demand remains sufficiently stable to be able to target an interest rate precisely. Autonomous factors are also more volatile. In a regime of abundant excess reserves, by contrast, market interest rates are less sensitive to fluctuations in the demand for and supply of reserves. Instead, the stance of monetary policy is transmitted by arbitrage linking the Federal Reserve's administered rates and market rates. This approach has been effective in controlling rates in the United States since the financial crisis as well as in other countries in which central banks have used it.

Second, because the means of rate control and the types of money market activity differ between the two regimes, the preferred choice of a target interest rate may differ, too. In the case of limited excess reserves, the Federal Reserve's tools most directly influence interest rates that banks pay in overnight markets—the effective federal funds rate and the overnight bank funding rate. In the case of abundant excess reserves, the choice of target rate is less straightforward, as Zeynep will discuss momentarily.

With regard to aspects of the regimes beyond rate control, a regime of abundant excess reserves provides more of the most liquid asset to the banking system on a permanent basis. A regime of limited excess reserves, on the other hand, might require banks to rely more on Federal Reserve facilities to obtain liquidity. Relatedly, as we saw during the financial crisis, injecting additional liquidity in a regime of limited excess reserves can push interest rates downward if the additional liquidity cannot be sterilized. This may require a transition to a new operating regime if policymakers wish to keep the policy rate above the effective lower bound—an issue that does not arise in a regime in which excess reserves are already abundant.

Finally, the two regimes differ in the likely quantity of reserves and balance sheet size, the magnitude of interest payments on reserves, and the space that might be available to use unconventional monetary policy in the future. We provided some estimates of total reserve balances in each regime in the memo: around $1 trillion in reserves for abundant excess reserves and about $700 billion for limited excess reserves in the medium term. These numbers are based in part on the survey that Patricia described, but I want to emphasize that they are highly uncertain. They depend on the interest rate sensitivity of banks' demand for reserves—a parameter on which we have only limited information. The staff believes that in a limited-excess-reserves regime, with the interest rate on excess reserves well below market rates, the volume of reserves demanded in the long run could be well below $700 billion; however, as I mentioned earlier, demand could be difficult to predict and thus pose significant challenges for rate control. The resulting total size of the balance sheet also depends on additional operational choices you might make that could affect the demand for reserves and for other Federal Reserve liabilities. These choices could include whether to introduce facilities that allow banks to convert Treasury securities to reserves on demand and whether to limit the size or volatility of foreign official accounts. In addition, the numbers could change in the long run, as the financial system adapts to whatever regime you choose to operate. Because a regime of abundant excess reserves would feature higher reserves, total interest payments on reserves would be correspondingly higher, though the effect on remittances would likely be offset by higher income received from the Federal Reserve's asset holdings.

These differences in reserve supply and interest payments may affect the amount of policy space available to respond to future negative shocks. In particular, returning to an operating regime similar to that used before the crisis might increase public trust in the Federal Reserve's ability to unwind asset holdings obtained using unconventional policy tools. If so, there might be greater acceptance of the Federal Reserve's use of such tools if needed in a future crisis. More generally, reducing the size of the balance sheet and of interest payments on reserves might help respond to some criticism the Federal Reserve has received. However, reserve balances in either regime would likely be much lower than they have been in recent years, and, as I mentioned, it might be possible to introduce policies that would further reduce the balance sheet. Zeynep will now describe the tradeoffs between different possible target interest rates in each of these regimes.

MS. SENYUZ. Thank you, Sam. The Committee's choice of an operating regime has implications for the choice of a target rate. This is because rate control works through different channels in a regime of limited excess reserves from one of abundant excess reserves, as Sam described.

As noted on your last exhibit, the role of the policy target rate is to communicate and transmit the stance of monetary policy. Under a limited-excess-reserves regime, policy implementation is focused on the reserves market. In this regime, the Desk conducts open market operations to equate the supply of and demand for reserves at the target rate. Therefore, the primary policy rates to consider are ones that measure the marginal cost to banks of obtaining reserves overnight—the effective federal funds rate, EFFR, and the overnight bank funding rate, OBFR.

Targeting the federal funds rate in this setting would provide continuity with your practice during recent decades. Currently, the vast majority of federal funds transactions reflect lending by Federal Home Loan Banks, FHLBs, while interbank trading represents only about 5 percent of measured federal funds volume. However, in a limited-excess-reserves regime, banks that are short of reserves have strong incentives to borrow, while those with abundant reserves have incentives to lend to other banks. Therefore, there is potential for more robust interbank trading to emerge if reserves become limited. Such a development could be important for the long-run stability of the federal funds market. On the other hand, if FHLBs shift their liquidity portfolios towards other instruments in light of potentially higher rates of return as well as new liquidity management guidelines which will go into effect next year, their lending in this market could decline substantially.

Another target rate option under limited excess reserves is the OBFR, which is calculated from federal funds trades pooled together with Eurodollar transactions. In addition, there are plans to widen the OBFR transaction base by incorporating certain onshore wholesale deposits next year. OBFR volume is supported by widespread investor participation and is more robust than the EFFR to potential market and structural developments. The framework for controlling the OBFR is essentially the same as that for controlling the EFFR, as banks borrow both federal funds and Eurodollars to obtain reserves and largely perceive the two instruments as substitutes. Communicating the stance of policy in a framework centered on the OBFR would largely follow your current practice, due to the similarities between the two rates. However, despite being twice as large as the EFFR volume, the OBFR volume could still be at risk of declining, as some regulations discourage overnight unsecured activity.

For the abundant-excess-reserves regime, the essence of this system is that the Federal Reserve does not adjust quantities but, rather, changes the administered rates on its liabilities and lets variations in those administered rates move other rates by arbitrage. This opens up the possibility of targeting a wider range of overnight rates than in the limited-excess-reserves regime.

The first rate option in an abundant-excess-reserves regime is your current policy rate, the EFFR. The Federal Reserve has so far succeeded in controlling the federal funds rate in this regime. However, FHLBs’ dominant role as lenders in the market, as well as suppressed interbank trading, creates a risk that federal funds volumes could substantially decline and the EFFR may become disconnected from other money market rates. It could be difficult to communicate the stance of monetary policy by operating in a small and idiosyncratic federal funds market. In light of these considerations, you may choose to switch to OBFR—the second option considered in the memo. The OBFR is currently the most comprehensive measure of the marginal funding costs of banks. Targeting the OBFR would provide operational and communications continuity with current practice while reducing some of the risks associated with targeting the EFFR. However, other risks would remain due to general regulatory disincentives to unsecured overnight borrowing and lending.

Your third option in a regime of abundant excess reserves is to communicate the stance of policy with a Treasury repo rate, such as the Triparty General Collateral Rate, TGCR, or a broader repo rate, such as the Secured Overnight Financing Rate, SOFR. Treasury repo rates directly affect the financing costs facing a wide range of financial intermediaries and, because of the repo market’s role in financing Treasury securities, would likely incorporate a robust volume of transactions under various market conditions. However, large-scale issuance of Treasury securities could put significant upward pressure on repo rates, and control of the policy rate may require operations correlated in time and size with Treasury debt issuance.

The final option we presented in the memo is to target the general level of short-term interest rates, GLOSTR. GLOSTR can be targeted either by specifying a new index constructed with secured and unsecured rates or by communicating the intention to keep most overnight rates within a specified range. As we saw following the technical adjustment to the IOER in June, the Federal Reserve's administered rates strongly affect overnight money market rates. However, variations in administered rates are not particularly effective in changing the spreads between market rates. As a result, it may be easier to target the general level of interest rates than any particular market rate in a regime featuring abundant excess reserves. GLOSTR would also be more robust to future changes in market structure that may affect the volume underlying any single rate. That being said, transitioning to GLOSTR would raise some communications challenges. I will now pass it over to Brian to discuss plans of other central banks for monetary policy implementation.

MR. DOYLE. Thank you, Zeynep. This fourth presentation—for which there are no slides—reviews recent thinking about future policy frameworks at the Bank of England and the European Central Bank, two central banks in economies that have large, complex financial systems, in some ways similar to the United States. However, before I begin, you may have noticed that my colleagues have very studiously avoided saying the words "floor" and "corridor." I'm going to break that rule—not necessarily because I think the distinction is a good one, but because it's better than the alternatives for this presentation.

Like the Federal Reserve, both central banks are currently in floor systems with abundant reserves after having made large-scale asset purchases and undertaken other programs, and both are reviewing their future implementation frameworks for monetary policy. The Bank of England has released a discussion paper with a high-level description of what, in that understated British style, they are "minded" to do for now—namely, to continue with a variant of their current floor system. They have invited comments on the paper from the public, are conducting extensive outreach, and plan to learn and adjust their views in response to the feedback. With regard to the European Central Bank, officials there have expressed support in the past to transition back to a variant of their corridor system. However, the ECB recently launched a large staff project to assess their future framework, and that project is not set to be presented to policymakers until next year. Consequently, the framework of the ECB, at least as it normalizes monetary policy, is a little uncertain.

Both institutions have discussed reasons to remain in some form of floor system. Their floor systems are currently providing reasonably good control of short-term money market rates, and it is believed that a floor system will continue to do so for at least some time in the face of uncertainty about the eventual level and volatility of the demand for reserves. Both foreign central banks believe this uncertainty stems from some of the same factors discussed by my colleagues—the effects of regulation and banks' continued desire for liquidity buffers post-crisis. The Bank of England also points to their increased number of counterparties—including financial institutions like investment firms and central counterparties—as raising uncertainty about the demand for reserves.

The Bank of England also cited some other reasons for remaining in a floor system. Doing so would provide flexibility in the event that the central bank decided to restart asset purchase programs or to adopt other unconventional measures. Moreover, financial institutions are familiar with the current system, and it is relatively simple. Finally, many of the Bank of England's smaller counterparties do not trade in interbank markets, so returning to a system featuring scarce reserves would impose some costs on them.

But, at least in the Bank of England's case, what a floor system will mean in their future implementation framework is somewhat different from how it is operating right now. Currently, the floor system at both the Bank of England and the ECB, as in the United States, is the result of the central banks having purchased large amounts of assets whose counterpart is abundant reserves. The Bank of England may decide to unwind most of those asset purchases as part of their policy normalization, perhaps in part because they made those purchases with an indemnification given by the U.K. Treasury. In that instance, reserves in the system will fall, eventually reaching the point when they are no longer relatively abundant—though, for both central banks, this point is likely some time off. At that point, in order to stay within a floor system, the Bank of England will have to provide more reserves. In the discussion paper, they say they primarily plan to do so by "regularly offering" repos (lending reserves against U.K. government debt) at Bank Rate (the BOE's policy rate and the interest paid on reserves), though other details of such repo operations are not specified in the discussion paper.

In this scenario, the Bank of England will be looking to financial institutions to determine the aggregate amount of reserves. The Bank noted that they would gauge demand for their operations through conversations with market participants, demand they observe at its liquidity facilities, and internal analysis. The aggregate level of reserves in such a floor system might be close to the minimum that financial institutions would demand at the Bank of England's prevailing policy rate. If this turns out to be the case, there might not be a big difference between the level of reserves in their proposed floor system and the amount of "scarce" reserves in a corridor system similar to what the Bank of England had before the crisis: a voluntary reserve target system, one in which banks chose their own reserve targets. The BOE will be learning as they go and may end up adjusting further their implementation framework as they do.

This concludes our prepared presentations. On the basis of your discussions today, the staff will, in consultation with the Chair, prepare memos and briefings for your December meeting that would allow you to clarify and ultimately communicate salient aspects of your preferred future policy implementation framework. We are now happy to take any questions you might have.

CHAIRMAN POWELL. Thank you very much for those presentations. Questions for the staff? [No response] No one is "minded" to ask a question? [Laughter] That being so, let's go right ahead to the go-round, and we'll begin with President Evans.

MR. EVANS. Thank you, Mr. Chairman. I'd like to thank the staff for a very useful set of memos. I know it was a lot of hard work. They did a great job in leading us through the wide range of issues that we're all dealing with.

The foremost goal of our policy implementation framework should be effective transmission of the desired stance of monetary policy to the real economy. The pros and cons of each alternative should be weighed with this in mind. The Committee should choose a framework in which our actions exert a strong, predictable influence over money market interest rates and do so in a fashion that's transparent and easily communicated to the public.

We could achieve these goals using either limited or abundant excess reserves. However, I prefer a regime with abundant excess reserves. Here are some of the considerations that led me to this judgment. First, the ability to control the target interest rate is crucial. In the years before the great financial crisis, we were able to control the federal funds rate using a scarce-reserves operating framework. But today, the new regulatory and financial landscape means that the demand for reserves is likely larger, less interest-sensitive, and subject to more shocks than it was in the past. In a limited-excess-reserves regime, these changes can make interest rate control more difficult than it was before the crisis.

Meanwhile, over the past 10 years in an abundant-reserves system, we've been able to exert adequate control over the federal funds rate. Even as recent events have put upward pressure on the federal funds rate, we've been able to keep it within its target range. So an abundant-reserves system already addresses the problem of rate control in today's financial system.

The second consideration is the transmission from the target rate to general money market conditions. If paired with an appropriate choice of interest rate target, I believe either the limited- or abundant-excess-reserves systems could work well during normal times. The key proviso here is “during normal times,” because liquidity crises and the effective lower bound pose significant challenges for the limited-excess-reserves framework. For example, suppose the target rate is well above zero and then we’re surprised by an episode of challenging liquidity pressures. Injecting liquidity where it is needed without pushing the funds rate below its target range could prove daunting.

I’m reminded of the October 2001 FOMC meeting after the terrorist attacks on 9/11. Markets and the payment system had been under extreme stress, and estimating the supply reserves that were actually available to meet liquidity needs had been exceedingly difficult. At that meeting, I recall a well-known inflation “hawk,” Jerry Jordan, arguing passionately that, under such circumstances, ample reserves should be supplied and the federal funds rate target should be thought of as a ceiling. In other words, err on the side of supplying abundant reserves, and don’t be too concerned if the funds rate trades low.

The lesson was that in a limited reserves regime, sometimes rate control may need to be sacrificed for liquidity provision. That was appropriate for the response to 9/11, but it’s easy to imagine other situations in which we’d still put a large premium on the FOMC’s ability to continue to control interest rates even as extra liquidity was needed in some part of the financial system. If so, we’d be in a difficult situation. And, separately, the limited-reserves framework will need to be abandoned altogether if larger amounts of accommodation are needed, like in the fall of 2008 and then when monetary policy is constrained by the effective lower bound. In contrast, a regime of abundant excess reserves can separate liquidity provision from interest rate control. And again, this is the system we would need to use when monetary policy arrives at the effective lower bound and we need to conduct large asset scale purchases.

A third set of considerations is the relative costs and benefits of the quantity of reserves that would be on our books. An abundant-excess-reserves system has the advantage of facilitating payment-system functioning. It also provides a banking system in which there are plenty of assets well suited for meeting the liquidity regulations we adopted to help prevent a repeated financial crisis.

But then there's the negative "optics" of the Federal Reserve making large interest payments to commercial banks. Previously, I thought that these would be much less of a concern in a limited-excess-reserves framework. But, in the new regulatory and risk environment, it appears that, even under a limited-excess-reserves regime, reserve levels would still be quite high, implying that IOER payments would still be significant. So any problems with optics would still be there.

All of these considerations lead me to support an abundant-excess-reserves regime.

For the choice of an interest rate target, the policy target must be under the control of the FOMC. This takes IOER off the table. The simplest thing to do would be just to keep targeting the federal funds rate. Now, tradition has its place. However, I'm concerned that with abundant excess reserves, the limited trading in today's federal funds market means that, over time, the rate will become more difficult to control and potentially less representative of broader money market conditions than it has been in the past.

Targeting the OBFR would be a natural first step beyond the federal funds rate. After the technical additions planned for 2019, OBFR will capture essentially all the markets that domestic banks use for unsecured overnight funding. This means it will represent these funding costs more robustly than the federal funds rate. Also, OBFR reflects only bank funding. This is our traditional touch-point to financial markets and covers institutions for which we have regulatory powers and supervisory insights.

What about targeting a Treasury repo rate? Secured funding is more important today than in the past, making repo funding rates sound attractive as a target rate, but the vast size of this market and the potential for idiosyncratic movements in rates and the issues surrounding interactions with Treasury financing activity make me nervous about using a repo rate as a target.

The general level of short-term rates, GLOSTR, also has appeal. After all, if it's short-term money market conditions we seek to control, why not target these rates directly? Unfortunately, there are a number of issues with GLOSTR that need to be considered before I would feel comfortable using it as a target. Still, we obviously care about the general level of short-term rates in gauging policy transmission. So I think it would be useful to develop some options for GLOSTR and monitor how they perform over time. We should also think about how they might work as a policy target, including how we would communicate about them with the public.

My bottom line is, when we transition to our new long-run operating framework, my preference is to adopt OBFR as our policy target. OBFR is the nearest reserves-market alternative that seems likely to work well over the medium term, and if in the long term OBFR proves to have drawbacks, then we should be ready with a broader measure of money market rates.

I definitely support our staff experts developing alternatives for the Committee to consider, and the Committee should be ready to pick one of them in the event that our policy rate instrument needs to go beyond OBFR. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President Harker.

MR. HARKER. Thank you, Mr. Chair. I'm tempted to just say "ditto" to everything that President Evans said [laughter], but I get paid piecework here by the minute, so— [laughter].

Before stating my opinion on how monetary policy should be conducted as we go forward, I would also like to thank—actually, praise—the long-run-framework group for the thoroughness of material, the timeliness with which it has been produced, and for scheduling their very helpful drop-in calls with members of our policy team in Philadelphia.

There appears to me to be at least three key elements discussed in the memos that guide my thinking concerning my preferred methodology for conducting policy. First, there appears to be a lot of uncertainty regarding behavior of future reserve demand, especially if the balance sheet should decline by enough to put us in a corridor system. Second, there are serious issues regarding the robustness of the funds market as rates continue to rise. And, lastly, and echoing President Evans, there are political concerns regarding the distribution of interest payments on reserves that do merit discussion. Also, the framework we adopt will be intimately tied to the facilities that are in place.However, in choosing an operating framework right now, the most significant aspect for me is continuity. If effective-lower-bound events will be a fairly regular occurrence, then I prefer maintaining an operating regime that is robust to rates being bounded from below—and that regime is a floor system.

I'm cognizant of the political concerns surrounding large amounts of interest payments to, predominantly, foreign banks and large, systemically important domestic banks. This feature of our interest payments has a bad look to it and could lead to political problems for the Federal Reserve System.

So, all things being equal, a smaller balance sheet is preferred. However, the likely difference in the size of the balance sheet that would result from operating in a corridor characterized by, say, a 100 basis point difference between the IOER rate and the discount rate and the size of the balance sheet that is no bigger than necessary to ensure a floor system, I think, is unlikely to be significant. I don't think that difference would be that large. But all things are not equal. The uncertainty surrounding the demand for reserves could lead to volatility in the funds rate that would be simply unpalatable to the Committee if a corridor system were adopted.

Our primary objective should be maintaining fairly tight control over our interest rate instrument. And, to reiterate: I also favor a floor system because it is likely that the effective lower bound (ELB) will be encountered on a regular basis. In that case, the floor system will provide continuity when there are ELB events. However, even a floor system operated with quantities of reserves significantly smaller than at present could experience some noise in funds rate behavior—the so-called "noisy floor" that occurs in the Afonso, Armenter, and Lester model. Their work also indicates that as repo rates rise and, as a consequence, the IOER rates needs to be adjusted down relative to repo rates, volume in the funds market could drop precipitously. The funds market would likely be dominated by idiosyncratic trades. In that case, the effective funds rate would be too narrow a construct by which to administer monetary policy, and I would prefer using the overnight bank funding rate as our policy instrument.

Now, I would not be averse to some measure of the general level of short-term rates as a policy instrument. But the derivation of that rate should be algorithmic and transparent, and again, as President Evans said, I think we need more thought on that and more research on that. At this juncture, adopting that general level of short-term rates as our instrument is, I think, a little premature.

The corridor system does have the advantage of operating with an even lower level of reserves. But, again, how much lower is an open question. We may be talking about a difference in the neighborhood of only a few hundred billion dollars at most. Because of the uncertainty surrounding future demand for reserves, the corridor system may be hard to administer under our current institutional setup. Doing so would require additional unexplored facilities and would almost certainly require Desk operations at a frequency greater than once a day.

Absent a facility that would allow reserves to be frequently adjusted in response to hard-to-forecast demand, the corridor system is likely to produce unwanted volatility in the funds rate. That volatility could presumably be reduced by keeping the spread between the targeted funds rate and the IOER rate rather narrow, so that banks do not have an incentive to manage their reserve balances actively. However, I think further analysis would be required before I was comfortable with transitioning to a corridor system.

Lastly, I also am not in favor of adopting an administrative rate that is not under the direct purview of the FOMC. Now, under the current Chair, such a procedure would no doubt be carried out smoothly. But governance issues may not always be resolved so amicably. Using IOER as our instrument, rather than as a tool to affect a major market-determined short-term rate, would be in some ways an arrogation of the FOMC’s statutory authority. Thank you, Mr. Chair.

CHAIRMAN POWELL. Thank you. President Rosengren.

MR. ROSENGREN. Thank you, Mr. Chair. In considering the appropriate operating framework and target interest rate, I would focus on five principles ranked in importance. First, choose a framework that best facilitates monetary policy transmission, which includes control of short-term interest rates that most affect the key asset prices that ultimately influence our dual-mandate goal variables. Second, ensure the capability to maintain effective transmission in the face of significant changes in reserves demand. For example, we saw increased volatility resulting from innovation in money markets and uncertainty about using reserves in order to satisfy liquidity requirements after changes to regulation and liquidity preferences after the financial crisis. Third, design the framework to operate with a minimum of disruption should we once again hit the effective lower bound. Fourth, maintain the flexibility to respond to financial stability concerns through the use of liquidity facilities. And, fifth, other things being equal, operational simplicity is preferred.

On these five criteria, my preference would be to operate in a framework of abundant reserves. Short-term interest rates can be effectively controlled in any of the regimes discussed in the memos. But I believe an abundant-reserves regime best meets the remaining criteria. In an abundant-reserves regime, changes in the demand for reserves due to regulatory changes and liquidity preferences have little effect on our policy rate, because we are operating on the flat part of the demand curve for reserves. Correspondingly, reserve demand volatility would be much more of an issue if we chose to operate in a scarce-reserves environment. In addition, an abundant-reserves framework would also allow us to respond seamlessly in the next recession, when it is highly likely that we will reach the effective lower bound, as the usual monetary policy response to a recession involves a decline in interest rates of about 600 basis points.

I would prefer not to change operational frameworks in the midst of responding to an economic downturn. To be specific: Suppose we started in a scarce-reserves environment. If the next recession were severe enough to require the use of quantitative easing, we would have to switch to an abundant-reserves environment. A similar argument holds with regard to liquidity concerns. If a financial-stability problem requires the provision of abundant reserves, we can accomplish this without affecting the policy rate if we are using administered rates to set the policy rate. This is, of course, not the case if we are operating in a scarce-reserves environment. Finally, we now have years of experience operating successfully with an abundant-reserves regime, and it is arguably much simpler than a scarce-reserves system in which we have to estimate the ever-fluctuating daily position of reserves demand.

As I suggested at the outset, the first of my criteria for choosing an appropriate policy rate is the extent to which it facilitates monetary policy transmission. The federal funds rate and the broader OBFR become much less relevant if we are operating in a system of abundant reserves. With plenty of liquidity, interbank transfers of federal funds become a sideshow to action in the more important parts of the financial markets.My preferred rate would be the SOFR. We are in the process of establishing this rate as the benchmark for most derivatives contracts. Assuming that the SOFR becomes widely adopted for derivatives pricing and is also increasingly used as the base rate for floating-rate contracts, it will likely become a key link in the monetary policy transmission channel. If so, then it seems an ideal candidate to serve as our policy rate. Because of SOFR’s role in financing Treasury securities, some might object to the perception that we are meddling in government finance. But I think we can counteract this perception by emphasizing that this rate is quickly becoming the reference point for a large volume of financial transactions, both on and off balance sheets. Thus, it is a concern for economic stabilization that motivates the choice of the SOFR.

Another potential concern—the twin of its strong connection to many asset prices—is the size of the market. As a consequence, significant Treasury securities market financing pressures or liquidity pressures could lead to a large, but likely fleeting, fluctuations in the size of our balance sheet. However, allowing our balance sheet to fluctuate is what would allow us to stabilize this key reference rate, so that it does not move significantly in response to temporary

Treasury securities market or liquidity shocks. That is, we would insulate the interest rate from shocks by letting the Federal Reserve's balance sheet absorb the shock. This, in turn, would help contain disruptions in financial markets that would otherwise be spread broadly, on account of SOFR's central role in many individual financial markets. Furthermore, during a financial stability episode, targeting a secured rate seems preferable to an unsecured rate, which would be subject to idiosyncratic movements associated with shocks to risk premiums. If we do move toward selecting the SOFR, we need to decide whether we will set the rate and allow quantities to fluctuate or attempt to manipulate quantities to hit a desired rate.

Thus, it would be worth discussing the merits of using a standing facility to control the rate rather than relying on periodic intervention by the New York Desk. Whichever combination of reserves and interest rate target we choose, I think we should have a much more robust communications strategy than was the case with the previous operational changes. Having a strong, principles-based justification for our choices should provide an opportunity to discuss not only why we are making these choices but also what it tells the public about financial market developments.

If the Committee were to choose an abundant-excess-reserves regime with the SOFR as the target rate, it could be emphasized that the regime provides a stronger connection to economic activity—a variable that we ultimately care about—as well as providing greater flexibility in recessions and periods of financial stress. We could also emphasize the advantages of using a secured rather than an unsecured rate during periods of economic turmoil. Such communication would help prepare the public and the Congress for actions we are likely to need to take if there is a significant shock to the economy. As an added benefit, the choice of the SOFR would likely speed its adoption as a reference rate. Thank you, Mr. Chair.

CHAIRMAN POWELL. Thank you. President Bullard.

MR. BULLARD. Thank you, Mr. Chairman. I also want to thank the staff for these concise memos on this important issue. The exact properties of the long-run operating framework are important for policy execution. But I believe that the macroeconomic consequences of our choice between a floor or corridor system are not likely to be important. That is, we can pursue, and achieve, our dual mandate under either system. Therefore, I believe that our choice between competing frameworks should be determined primarily by operational efficiency, ease of public communication, and mitigation of political repercussions.

The advantage of a floor system is that it is socially efficient. Reserves are essentially costless for the Federal Reserve to create, so scarcity of reserves should be eliminated. At this point, the opportunity cost of holding reserves is zero; that is, reserves pay the market rate of interest, say, on three-month T-bills. This is, effectively, the Friedman rule. The disadvantage of a floor system and paying interest on excess reserves at market rates is that the Fed incurs substantial interest expense. At 3 percent and $1 trillion in reserves, annual interest expense is approximately $30 billion. While paying this sum is feasible and arguably has no macroeconomic consequences, the political optics are poor, as emphasized by Presidents Evans and Harker. Diverting such sums from the U.S. Treasury to large banks—half of which are foreign—for doing nothing looks bad. Fortunately, I do not think it is necessary to pay out such a large sum to achieve our operating goals.

A second-best solution in such an environment is to offer a rate of interest on reserves that is close to the Friedman rule rate but low enough that our interest expense is minimized, thereby largely eliminating the political "optics." In order to keep the policy rate close to the

Friedman rule, the system needs to have ample reserves but not so abundant as to stop trading in the interbank market altogether.

Toward this end, in St. Louis we prefer the following system. First, set the interest rate on required reserves to market rates and the interest rate on excess reserves to zero. This satisfies the Friedman rule for required reserves but not for excess reserves. Second, operate repo and reverse repo facilities in which financial intermediaries can borrow—the repo facility—or lend reserves at the reverse repo facility against collateral, presumably U.S. Treasury securities. The borrowing rate would be significantly above market rates, while the lending rate would be slightly below market rates. Thus, we would be running a corridor system, but reserves would be ample enough to nearly satiate the demand for reserves. The reason we prefer this structure is that, first, the system will be nearly flush with reserves while, second, the reverse repo rate will nearly satisfy the Friedman rule by being slightly below market rates. And, third, intermediaries will trade with each other due to the higher market rate, as opposed to using the reverse repo facility or holding excess reserves, so interest expense for the Fed will be minimized.

We also think a repo facility can help address a number of issues. First, it may help during the transition to this new regime, as banks take some time to adjust their balance sheets. If there are upward pressures on market rates during this transition, the repo facility can damp the effects and allow a smooth transition. Second, if we think part of the desire for reserves is arising from banks' liquidity stress testing, as suggested in the staff presentation, then a repo facility may encourage banks to hold Treasury securities in normal times, because they know there is the Fed option in times of stress. If true, the facility reduces the banking system's demand for reserves in normal times. We encourage the staff and policymakers to think about other Federal Reserve activities that can aid the Committee in reducing reserves so as to implement policy most efficiently and effectively.

Regarding the choice of the policy rate, we believe it is time to stop using the effective federal funds rate. The federal funds market has been and continues to be plagued by the fact it has a small number of participants, both on the lending and borrowing sides. With regard to other options, again, we believe there are no serious macroeconomic consequences stemming from choosing one rate over the other. One advantage of using the overnight bank funding rate, OBFR, is that it includes federal funds trades but is a broader measure of interbank trading rates. As it is an unsecured interbank lending rate, targeting it will be very similar to targeting the federal funds rate, and it will be easy to communicate this choice for our new policy rate.

We understand that the Fed has started collecting selected deposit data to enhance the OBFR. If we move forward with this new policy rate, we should get these new data included in the rate before the regime is launched. Using a repo rate as the policy target would seem to be the logical choice, taking into account our preferences for repo facilities to conduct monetary policy. However, we are aware of the vagaries of the repo market in terms of more volatility of rates due to Treasury debt issuance and the appearance that we are pegging the cost of debt issuance by the U.S. Treasury.

Finally, an index of a broad range of short-term money market rates is very appealing and would eliminate idiosyncratic movements that can occur with a single rate. However, constructing such an index, along with communicating our policy actions in response to the index, seems to be a complex task. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President Mester.

MS. MESTER. Thank you, Mr. Chair. I also want to thank the Board and Reserve Bank staff for the helpful set of memos and briefings. In selecting an operating framework, the primary consideration for me is that the framework allows for effective control of a policy rate that's sufficiently tied to other market rates to allow the reliable transmission of monetary policy throughout the economy. Both the scarce-reserves and abundant-reserves operating frameworks have proven to be effective during the periods in which they've been used. However, at this point, I'm not convinced it's feasible to return to the pre-crisis scarce-reserves framework.

I note that in the Committee's discussions of the use of large-scale asset purchases during the financial crisis, some participants pointed out that the increase in the size of the balance sheet and the changes that entailed for the federal funds market might preclude ever returning to a scarce-reserves operating system. I think that's likely to be the situation that we're in. Even before the Global Financial Crisis, the Desk devoted significant resources to estimating the demand for reserves, so they could determine the daily level of open market operations needed to hit the federal funds rate target. The federal funds market has changed considerably since the financial crisis, and regulatory changes have likely affected the banking systems' demand for reserve balances. There are differences across banks in their desire for cautionary reserve holdings and in their views on the substitutability between reserves and other high-quality liquid assets.

Estimating the demand for reserves will be more complex now, suggesting there could be considerably more volatility in the effective federal funds rate. It's likely going to be harder to implement effective interest rate control with scarce reserves than it was before the crisis. The abundant-reserves framework would be less complex to implement; but even with this framework, there would need to be some learning along the way as the balance sheet and reserve levels shrink from current levels. Presumably, we would want to have no larger a balance sheet than is necessary to provide for an adequate cushion to stay within the flat part of the demand curve for reserves. There's considerable uncertainty about the level of reserves at which the demand curve flattens, so it's premature to be very precise about what the ultimate size of the balance sheet and aggregate level of reserves will be at the end of normalization. Over time, we'll learn more about the demand for reserves and the likely size of our balance sheet. We'll also learn whether we need a quota system limiting the interest paid on reserves above a certain level, along lines similar to the regimes employed by the Norges Bank and Reserve Bank of New Zealand.

Now, this abundant-reserves regime does have some costs that should be recognized. First, the public may view the relatively large balance sheet as an indication that we could not fully normalize policy after the LSAPs. The higher levels of interest payments to banks might also be questioned. If the Congress were to take away the power to pay interest on excess reserves, we'd have to change frameworks. The lack of an operating constraint on the size of our balance sheet might also generate requests that the Federal Reserve aid specific industries or use the balance sheet to fund government initiatives, as occurred during and since the crisis. And it might lead to more limits on our use of LSAPs in the future. I believe these considerations can be handled by the Fed effectively communicating to the Congress and to the public the reasons for selecting this framework and the important components like IOER needed to make it work.

Since an abundant-reserves regime affects rates by arbitrage, there are several rates we could consider for communicating our policy stance. At this point, targeting the overnight bank funding rate appeals to me the most. Being an unsecured overnight bank funding rate like the federal funds rate, it's the most similar to our current way of communicating. But because it also includes Eurodollar transactions, it offers more control of, and connection to, other market rates. Now, if the volume of this expanded set of transactions ends up declining over time due to regulatory changes or for other reasons, we could switch to an alternative target, but at this point, the continuity with the current practice appeals to me.

I would not favor using the IOER to communicate our policy stance, because it's a rate that the FOMC does not set. I also do not favor using the general level of short-term interest rates, the GLOSTR. Assessing whether the GLOSTR is at the target would be difficult. And at times the various components of GLOSTR could diverge, complicating policy setting and communications. In addition, the Federal Reserve Act states that interest on reserves should be "at a rate or rates not to exceed the general level of short-term interest rates." At times, this stipulation might end up constraining policy, depending on how the GLOSTR was formulated.

Targeting a Treasury repo rate has some positives. The market is large, and the rate would likely transmit well to other rates. However, because the repo rate would vary with Treasury debt issuance, the staff memo indicated that there would likely need to be an overnight repurchase agreement facility as well as the existing overnight reverse repo facility to ensure effective interest rate control. Because of the size of the market, large transactions might be needed to control interest rates. These considerations make targeting the repo rate less appealing to me at this time. Thank you, Mr. Chair.

CHAIRMAN POWELL. Thank you. President Bostic.

MR. BOSTIC. Thank you, Mr. Chairman. Like my other colleagues, I commend staff of the Board and Reserve Banks for the quality of the briefing materials to facilitate this discussion. They create a nice basis for our conversation today.

My preference is to target a secured repo rate in an abundant-reserves regime. Post-crisis regulatory changes will affect demand for reserves in yet unknown ways. So I believe the uncertainty as an operational complexity of "going home" to a scarce-reserves framework could loom large—large enough to pose risks to monetary control directly or to the perceptions of control during a long transition period. Moreover, the possibility of a return to the effective lower bound leads me to favor a regime that is robust and agile in the face of financial and economic distress.

The abundant-reserves regime provides this robustness. Our three years of experience in utilizing administered-rate tools to control the federal funds rate has provided the Desk with valuable institutional knowledge about how policy changes affect the constellation of money market rates in this regime. Overall, I am confident that we can achieve monetary control in a variety of market conditions with abundant reserves.

I would, however, prefer to move to a secured-rate target. The current nature of the federal funds market has already necessitated technical adjustments in the spread between the interest on excess reserves rate and the top of the target range for the federal funds rate.

To be honest, these adjustments don't feel very technical to me. We are adjusting the true drivers of policy to manipulate a rate that reflects a small amount of trading between Federal Home Loan Banks and some depository institutions. It would be better for our policy rate to be more reflective of a rate that incorporates a broader set of trades and counterparties so that achieving monetary control is not vulnerable to small changes in market structure or the business models of a few institutions. The overnight bank funding rate would be an improvement in this regard. But, as the staff noted, use of it is also vulnerable to the stance of, and changes in, regulation. And this makes me nervous.

All of this leads me to view the repo rate as the best alternative target rate. The repo market is large and involves a broad cross section of financial institutions. This would make a repo policy rate more robust to market structure dynamics. Moreover, a repo target would involve, in my mind, a very straightforward use of repo and reverse repo facilities, both of which are governed by the FOMC. To be sure, IOER would need to be set in concert with these repo rates, but it could be viewed as a secondary tool.

Finally, I would like to raise an issue that came up in our discussions in Atlanta but that was not raised explicitly in the memos. All of the analyses and alternatives are predicated on the current state of bank regulation. As I stated earlier, my support for an abundant-reserves regime derives in large part from the control problems associated with regulation-driven uncertainties about reserve demand. But this position includes a tacit assumption that it is optimal or appropriate to provide a large amount of reserves as a feature of a secure and stable financial system. Put another way, I am assuming that it is desirable, or at least a matter of indifference, for the Federal Reserve to be a provider of high-quality liquidity in lieu of forcing banks to obtain these assets from the private market.

If there are monetary-policy-related costs or risks to running an abundant reserves regime, then it seems to me that we ought, at some level, to be integrating discussions of monetary policies with those about bank-liquidity regulation. This would bring us closer to internalizing any externalities that liquidity regulation is imposing on the choice of a monetary policy regime. If the major consideration stopping us from returning to a scarce-reserves regime is the uncertain and fluctuating nature of the demand for reserves for liquidity purposes, then an obvious question seems to be: Could any regulations be rewritten to help reduce the volatility of the demand for reserves without hampering bank liquidity and financial stability?

Finally, I would like to acknowledge Lorie Logan for engaging with my team by offering her perspective on some issues that we were unclear about. Her timely responses contributed to my getting clarity on these issues and helped me reach the view that I have put forward here. Thank you, Mr. Chair.

CHAIRMAN POWELL. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Mr. Chairman. Thank you, staff members, for preparing these memos. And I also want to thank the staff as well as the staff of the New York Fed for helping answer a number of our questions and helping us get up to speed for this meeting.

I believe that the current floor system with abundant reserves is likely to be most appropriate. There are several reasons for that, and many of these have been mentioned. For instance, regulatory requirements; the need for high-quality liquid assets; the fact that settlement of Treasury transactions typically occurs on a T+1 basis, a fact that has caused banks to want to hold reserves to meet immediate payment needs; the risk-management mindset of financial institutions at this point in our development; the fact that in the next downturn, we may well choose to increase the Federal Reserve balance sheet again; the fact that we now have years of experience, as has been mentioned, operating an abundant-reserves floor system; and also the fact that if we were going to get to a corridor system—I think having role-played this out with my team—there’s just a lot of execution risk and uncertainty about how we might get from here to there and making sure and having confidence that our estimates of demand for reserves are accurate.

Now, having said why I believe the current abundant-reserves floor system is most appropriate, I also believe it’s critical that we look for ways to reduce the size, and probably alter the mix, of our balance sheet. Number one, I do think we should continue to find ways to reduce the size of the MBS portfolio as a percentage of the total SOMA portfolio. We should be moving toward a portfolio that's made up substantially—if not completely, ultimately—of Treasury securities. Number two, even with abundant reserves, I would like to see—as I think a couple of people have mentioned—whether we could look at ways to make banks' Treasury security holdings more equivalent to reserves, which would probably involve examining Treasury settlement and make Treasury securities a more viable alternative to holding reserves. And, as President Bostic just said, we also agree at the Dallas Fed that it would be a healthy thing to review our regulatory framework to see if there are prudent ways to reduce banks' demand for reserves without materially weakening our strong macroprudential policies. We think that would be a good exercise.

Regarding the target rate, as many others do, we too worry that federal funds volumes could substantially decline, jeopardizing the federal funds rate as a sustainable target. As for the OBFR, we do believe that is a good, at a minimum, interim solution, although we understand that it may ultimately raise some issues related to volume, but it may be a good interim target. We are attracted to some type of repo rate index. We think this may ultimately make sense accompanied by a floor and ceiling mechanism. However, the SOFR is going to be volatile or could be volatile on account of Treasury debt issuance, and there are also concerns that, in times of stress, a secured funding target rate might have drawbacks. So, at a minimum, we assume we're going to need to spend a substantial amount of time exploring the issues connected with SOFR and coming up with an execution and communication plan in order to get comfortable with this approach. I guess you could say the same about GLOSTR. It has some appeal. I'm just more skeptical about whether we could ever get to an execution-and-communication plan that we were comfortable with on GLOSTR, as opposed to looking at some type of repo rate.

Last comment: We've spent a fair amount of time getting ready for this meeting, looking at the approach that's used in New Zealand and Norway, which is a tiered approach to remunerating reserves. And I think it's possible that what President Bullard was referring to is something along those lines, that a tiered-rate system pays a different rate on the margin based on the quantity of reserves held by any one bank. This approach might give banks the incentive to distribute reserves across the banking system, and I think that, at a minimum, it should be studied to see whether it has applicability for us as a way to increase incentives for banks not to "over own" reserves. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. Governor Clarida.

MR. CLARIDA. Thank you very much, Mr. Chair. And thank you to the staff not only for today's briefing, but for excellent and extensive background material. With regard to abundant excess reserves, I'll begin by saying that we are familiar with that system. We've been operating with abundant excess reserves for a decade, and familiarity is important—and also for reasons we all understand that have to do with fundamental and, I think, positive changes in the financial system, there are structural changes in the level of demand for high-quality assets both today and for the foreseeable future. So, much as I might have thought some time ago that we could get back to the world of 2006 and '07, I don't believe anymore that that will be the case.

Thinking about our options, we need to acknowledge, of course, realities, as those who have spoken before me have done. I also believe the whole concept of required reserves now versus excess reserves is itself an evolving one, due to the considerations that financial institutions confront in managing their businesses.

So I am in support of an abundant-excess-reserves regime. But my enthusiasm for that support is tempered by the uncertainties today about the level of reserves that will be required to operate it. It would be an easier decision for all of us if we knew that number. We don't.

I'm not suggesting that there is a knowable number. But I think of this process now, in my own mind, as evolving from this set of initial conditions. I would make a couple of points. The first is, I think someone who spoke before me made reference to this idea of a "noisy floor." As I look at some of the analysis I've seen in our briefing materials, at least as I read the charts—for example, in Tealbook B, chart 6—it does indicate that under scenarios of levels of reserves north of $1 trillion, rates trade somewhat above the floor. So, obviously, there will be some concerns in terms of rate control even with abundant reserves, at least according to the staff numbers. I think we need to acknowledge that embracing the system means that there will potentially continue to be some concerns about the noisy floor.

In terms of the rate that would be useful to target, I have a preference for the OBFR for a couple of reasons: One is continuity. It's similar to what we currently do, and, more broadly, I do have some comfort with the notion of having us focusing on an unsecured interbank rate, as opposed to a rate tied directly to sovereign debt issuance, and I'll give two reasons for that. The first is simply that, traditionally, what the Federal Reserve does is focus on appropriate levels of credit and intermediation, so it's natural to think of an interbank rate in that context. A second reason related to the first is that, in a period of crisis, I think it can be useful for there to be some stickiness in the interbank funding rate. Risk premiums go up and down. Animal spirits rise and fall. So, if we were to target a riskless rate and have a lot of fluctuations in funding rates, then that might not be desirable. And, of course, the other potential political-economy challenge associated with a rate tied closely to Treasury debt issuance is that, in effect, we could be characterized as essentially pegging the Treasury's borrowing cost. We all know that these things are interrelated, but I think that is a consideration as well.

In terms of targeting GLOSTR, in theory it's something that could work. In practice, I think targeting it could be difficult to communicate. In particular, the way in which one would define the general level of short-term interest rates could be a challenge. Thank you very much, Mr. Chairman.

CHAIRMAN POWELL. Thank you. Governor Quarles.

MR. QUARLES. Thank you, Mr. Chairman. Let me start, like everyone, by thanking the staff for that very informative set of memos. I really think they were models of useful analysis for policymakers and should be laminated and placed in everyone's drawers. [Laughter] They were clear without being condescending and usefully technical without spiraling off into Ptolemaic obscurity, and I found them wonderful.

On the choice between abundant and scarce reserves, it's clear that there are pluses and minuses, as the memos make clear. With regard to an abundant-reserves approach, I do worry—as President Mester in particular, I think, referred to—about the political-economy consequences of maintaining a large balance sheet. Having the FOMC control such a large stock of assets presents what the lawyers in the room will recall from your first-year torts class is called an "attractive nuisance." And for the nonlawyers in the room, an attractive nuisance is an object that a property owner allows to remain on his land when it is obvious both that the object will be dangerous if misused and that misusing it will be irresistibly appealing to passers-by of impulsive and immature judgment, such as children and congressmen. [Laughter] Such an abundant pool of assets could look culpably fallow to busy future legislators faced with ambitious goals and empty wallets—potentially leading to far-reaching interventions and distortions in asset markets and the economy.

Likewise, shrinking the balance sheet into the territory of reserves scarcity would signal the reversibility of the extraordinary actions that the Fed took during the crisis, and that reversal could increase political support for taking such action again, by showing that LSAPs don’t need to lead to permanent and irreversible consequences. In addition, I think it could be argued that returning to something more akin to the pre-crisis framework could increase the effectiveness of LSAPs in the future. I think a very common view of why the first round of quantitative easing was more effective than the second or the third was that it was a big change. People were slapped across the face with a flounder, and that was an important part of the effect. And if we moved back to a pre-crisis framework, that would increase the signaling effect of future LSAPs.

On the other side, as everyone has mentioned, an abundant balance sheet has at least the potential to greatly simplify the operational framework, especially in the presence of shifting an uncertain demand for reserves. But I do have to say that the recent serial increases in the federal funds rate relative to IOER, even in an environment of significant excess reserves, do give me some concern that perhaps interest rate control in an abundant-reserves regime is not going to be quite as simple as we might hope. Now, as I said in August and as highlighted in the staff memos, one area of uncertainty is how banks’ demand for liquidity, in part to meet regulatory requirements, will affect the demand for reserves and, hence, the price for reserves as the supply shrinks. Up to now, banks have shown considerable differences in their desired reserves holdings, and this heterogeneity could reflect underlying structural differences in business models or could reflect the fact that banks are still in the process of learning how to manage their balance sheets in response to regulatory and market changes. This learning process could be reflected in what I view as the implausibly low-sensitivity to interest rates of the demand for reserves that was reported in the survey evidence discussed in the staff memo and as to which the staff also indicated a fair bit of skepticism.

As reserves become more scarce and prices increase, it would be surprising if demand didn't prove more elastic than reported. In short, we are probably in a period when the demand curve for reserves is somewhat unstable and prone to shifts and changes in slope. I view that environment as being challenging for interest rate control in a scarce-reserves regime, but I'm not convinced that the challenges will be wholly eliminated in an abundant-reserves regime. So, in the end, my preference, and I don't think I'm alone, would be to come as close as possible to splitting the difference—that is, to maintain an abundant-excess-reserves, floor regime framework, but with the smallest feasible amount of excess reserves. Of course, that's likely easier said than done. In particular, identifying the minimum abundant-reserves balance sheet seems daunting in the face of potential shifts in the demand for reserves.

I did appreciate the table of indicators in the staff memo on recent developments in reserve markets and understanding the demand for reserves. I think it's useful to have a dashboard of indicators that we can monitor as we shrink the balance sheet, rather than descend the staircase in the dark and then have to reverse course once we realize that we hit bottom. Perhaps these indicators will shine a little light—maybe not quite like a flashlight on your iPhone, but just having the screen on your iPhone to help you down the stairs so that we can avoid having to backtrack. Then, in addition, I want to pick up on the comments made by both President Bostic and President Kaplan. I do think we want to think carefully about regulatory incentives that we are creating for demanding reserves, particularly through formal and informal liquidity regulation.

Obviously, that's not to say that we should calibrate liquidity regulation in a way that we think is unsafe or anemic, but rather that, at the margin within the wide range of liquidity levels that would be consistent with high levels of bank resiliency, we should keep in mind that there are collateral consequences of that choice for other responsibilities of the System. And if some of the anecdotes are true that we hear of supervisors informally insisting that banks meet much of their liquidity requirements with reserves rather than other forms of high-quality liquid assets (HQLA)—and I think those reports are probably exaggerated, but neither do I think that they are fabricated—we should push against that informal regulatory intensification of the demand for reserves.

Finally, on the choice of interest rate targets, I see the appeal of the overnight bank funding rate regardless of choice of framework. The downsides to the federal funds rate in the abundant-reserves regime are clear, with pricing determined in a thin and somewhat idiosyncratic market. By widening the scope, the OBFR has the advantage of greater liquidity without presenting too much of an additional communications challenge. If we were to return to a scarce-reserves regime, some of the current problems with the effective federal funds rate would likely fade. But, even in those circumstances, I wouldn't see much cost, and see some benefit, in moving to OBFR as the target rate. In addition, I do agree with everyone who has called for continued work on other measures such as SOFR and GLOSTR. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President Barkin.

MR. BARKIN. Thank you, Mr. Chair. I'd like to thank Lorie and her team for the time they spent bringing me up to speed on this and the discussions you've had over the past several years. It was hard work for them.

I am comfortable with the floor system operationally. Control of short-term interest rates is the primary concern, and over the past few years, we've learned we can achieve effective control by moving IOER in a setting of abundant reserves. The floor system also has the benefit of operational simplicity and relatively low cost, and that's what we had envisioned when, before the crisis, we first considered a floor system. The floor did also serve us well in the crisis and proved to be effective and workable in extreme conditions. And, finally, in the post-crisis regulatory environment in which banks need to hold large balances of high-quality liquid assets, there probably is a benefit associated with reserves constituting a substantial share of those assets.

I have two concerns I wanted to put on the table. The first has to do with governance. Like President Harker, I don't envision this being a problem in the routine conduct of monetary policy. I understand that an arrangement in which the Board will move IOER in a way that is consistent with the Committee's intentions for interest rate policy should work well, as it has already. But it's worth thinking about whether this arrangement is robust to low-probability, but dramatic, changes in the makeup and behavior of the Committee. I don't have a solution regarding how to guard against such a divergence, and I'm not suggesting we reopen the Act, but in the future we may want to think through how to prevent that risk.

My second concern, as others have said as well, involves the optics of staying with a system that retains a larger balance sheet and larger volume of reserves than what prevailed pre-crisis. A corridor system, even if total reserves are larger than before, gives us a more natural way to "tie a bow" around our QE crisis response. And I do think it's important, when the time is right, that we tie a bow around it. We know there are a lot of constituents who "demagogue" the size of our balance sheet, and that tendency in an extreme scenario puts us at risk.

Communication, therefore, takes on additional importance. I imagine this to be a collective effort to reinforce the consistent message about why this is a better system and why the size of reserves we're setting is the size as needed to effectively conduct monetary policy. This is a good opportunity to separate ourselves from our past, through the operational choices we make. Committing to buying only Treasury securities when adding assets to our balance sheet in the future is a natural step, and it makes a good break with the period of unconventional policy. Following this path merely requires continuation of our ongoing balance sheet normalization.

We can also look for balance sheet reporting practices that will support our characterization of the floor system as ordinary. For instance, expressing our reports on balance sheet measures in terms of shares of GDP, as has been displayed in Tealbook B, could militate against the perception that we're doing something extraordinary. Similarly, emphasizing separate measures of reserves and currency could be useful in sharpening our ongoing communications, and we might report on the benefits to the soundness of our banking system to having reserves be a large share of high-quality liquid assets.

Finally, I like the staff's suggestion of reducing reserves via use of a standing facility that allows banks to monetize their holdings of Treasury securities late in the day. That would help with the "optics" as well.

On the choice of interest rates, I don't have a strong preference. The simplest approach would be to use the interest rate paid on reserves to express the stance of monetary policy, but that requires governance to be addressed, as I noted earlier. We would, of course, in that instance, monitor the general behavior of short-term market rates and could include discussions of market rates in policy communications. On the other hand, if expressing the Committee's policy intentions in terms of a market rate like the OBFR would be seen as helpful on the governance dimension, I'd be comfortable with that as well and open to the staff's recommendation on which rate or index is best to use.

CHAIRMAN POWELL. Thank you. President George, please.

MS. GEORGE. Thank you, Mr. Chair. Like others, I found the background materials helpful in thinking about this issue. We, too, benefited from the briefings that the staff offered. And I also like the "case approach" that came out in one of the subsequent memos as a supplement to this. I found that helpful to look across. At the time when we were crafting our normalization principles, talking about the amount of securities we would hold in the longer run, I, on the same lines as what Governor Clarida said, thought that we were going back to the regime we had. Today, though, the consequences of our unconventional policy actions and the demand that we see by the largest banks for safe liquid assets, I think, is going to make it very difficult to return to a regime of limited excess reserves.

And while I agree the current operating framework has been successful in controlling interest rates, I think it would be worthwhile to discuss additional details about the implications of maintaining abundant excess reserves. This is particularly important as we shift the balance sheet focus from being asset-driven—as a means of influencing long-term rates—to one that is liability-driven—to accommodate changes in the Treasury's deposit holdings in their Federal Reserve account and demand for currency and reserves. And in my view, this liability-driven focus would imply that we would primarily hold short-term assets and exchange our MBS holdings for Treasuries. We should also try to address the perception that our payment of interest on reserves is a subsidy to large banking organizations. If the estimated demand for reserves, even under the limited-reserves regime, is as large as suggested in the memos, these payments would be substantial and possibly controversial, especially in a rising rate environment or in circumstances in which market rates were below IOER.

One option might be to consider steps to reduce the remuneration on reserves—either by paying interest on excess reserves well below the policy rate in a corridor framework, or through a quota, or limited-access, system in a framework with a surplus of reserves. We should understand whether the increased demand for reserves must be satisfied by central bank liabilities or some substitute, such as Treasury securities. In an ideal framework, I would prefer to see the banking sector holding more Treasury securities and the Federal Reserve holding fewer. As things are structured now, many large banking organizations prefer holding excess reserves to holding Treasury securities because of the need to sell in a stress event. It's important that we not be viewed as supplying required liquidity to a subset of the banking industry. Of course, liquidity provision in a stress event is one of the basic functions of a central bank. But we might consider whether that liquidity needs to be in the system all the time or if there are other ways to perform that function with fewer excess reserves.

Finally, with respect to which market rate to target, the interbank market has atrophied as a consequence of our past balance sheet policy. We should acknowledge this reality and move away from targeting the federal funds rate. What replaces that rate is less clear to me today. The OBFR certainly is more robust and bank-centric, but we should explore further repo rates, including a general level of short-term rates for longer-term robustness, I think.

And, finally, I wanted to agree with the emphasis that President Rosengren placed on our communications surrounding all of this. I think we have an opportunity as we talk to the public about why the operating framework is one that benefits us broadly. Thank you.

CHAIRMAN POWELL. Thank you. President Daly.

MS. DALY. Well, let me break with the tradition so far and start by saying it's an honor to be here at the table, and I really appreciate all of the support I've gotten in my move from back there to up here. I'll start with that.

But it's been a little bit like a baptism by fire, if you will, to start with the implementation framework. And, to that end, I think the staff's work in the memos and the calls to my staff were very helpful. And I really like that last memo that President George just referenced that told us what the options were in a quick summary. So I appreciate that.

Now, these implementation questions are quite challenging. We don't have precise estimates of the costs or the benefits of the proposed frameworks, so assessing the tradeoffs naturally involves a good deal of judgment and considerable uncertainty. So, in thinking about the choices, I just returned to first principles, which I think is what many people did here. What would we do if we were setting up a system *de novo*—from scratch? Well, above all, and first, we would want a framework that provides seamless monetary policy control when the interest rates are above or at zero, especially in our current environment. In addition, we would want a system that facilitates the supply of liquidity in times of financial stress and supports financial stability. So these economic criteria, if you will, point me toward a system of abundant reserves.

And I think, fortunately, on practical grounds, after a decade of experience, we know the system works well and is straightforward to operate, even at the effective lower bound. But here I think it's important to go beyond the economic criteria and the recent experience and say that public perceptions are also important. And as the memos describe, a system of abundant reserves is prone to bad optics. Paying interest to large domestic and foreign banks can give the false impression that the Federal Reserve System favors a few select institutions. A large balance sheet also can foster the impression that the Federal Reserve is moving outside its policy lane, as has been mentioned many times around the table. Now, I think good communications can help change such perceptions, especially if we started early and we hit that drumbeat often. But I realize that for some Fed-observers, those views may be well entrenched. And as Governor Quarles has mentioned—and I learned a new phrase—we will have an "attractive nuisance" that we will have to deal with. But if that should occur, ultimately shifting back to a regime of scarce reserves will remain an option to us. But I would like to note that it may not alleviate the political-economy issues if, as the memos suggest, the difference between an abundant-reserves and a scarce-reserves system isn't that large. And moving to a regime of limited reserves would entail some operational uncertainty, due to the changes in regulatory environment and risk appetite.

So now to turn to, if we remain in the abundant-reserves system, what interest rate to target. Again, I did go back to the first principle, although I don't think it's going to be very popular, and said, "Well, if we were starting from scratch, we might use an administered rate." That would be the simplest and clearest way to communicate our policies. Many foreign central banks do this. For example, the Bank of England uses the administered rate for its execution of monetary policy. They call it simply "Bank Rate." But, of course, we're not starting from scratch, so shifting from the federal funds rate to an administered rate for policy communication would require further discussion and staff analysis. I echo President Harker, I think, when he said that it may be worth considering this, even though we face some challenging governance issues.

For now, though—and, again, I might be unique at the table—the federal funds rate is continuing to serve us well. I recognize all of the risks that were outlined in the memo, but we are not there with a pressing need to fix that problem today. So it gives us a little time. But it is prudent to continue to think about other rates. And when I think about the ones in order, I think of the OBFR as an attractive alternative. At the very least, it is an option we should have readily available, but we can afford to wait and see if we need to use it. If we are then searching for an additional option, then I think shifting from an unsecured to a secured market rate, like the repo rate, would be appealing, and it certainly seems worth keeping on the table. Thank you.

CHAIRMAN POWELL. Thank you. President Kashkari.

MR. KASHKARI. Thank you, Mr. Chairman. Like many others around the table, I support a floor system for the reasons we've talked about—monetary policy control, less complexity moving when we have zero-lower-bound events. Potentially having to move from corridor to floor systems and back and forth—that seems needlessly complicated. But, like Governor Quarles, I would encourage us to try to achieve as small a balance sheet as possible, and I appreciate the staff surveys, and I appreciate their caveat to the surveys.

I'm really skeptical on how useful those surveys are. You know, I am reminded when I was doing this preparation with my staff—I have visited food banks in Minnesota, and the one thing that they always tell me when I visit them is, "Our volumes are up. People are hungry. The needs are up." And I say to them, "Well, how can your volumes be up, with an unemployment rate of 3.7 percent compared with when it was 10 percent? How can it be that more people are hungry today?" They never say this, but my interpretation is, when you give away something for free, people demand more of it. And so I'm skeptical that when we call commercial banks up and say, "How many of these reserves that you find valuable do you need?," they're putting up big numbers, and we don't really know what the actual demand is going to be for these reserves, because we're giving away something that they find valuable. We're actually paying them to take it.

So I'm not surprised when we ask them and they give us big numbers. I would encourage us to try to come up with a strategy in the context of a floor system to explore how small the floor could actually be. And I would encourage the staff to look at what would we look at if we walked down the stairs, as Governor Quarles said, to really explore that, so we can make it as small as possible. And like President George said, if banks end up holding T-bills instead of reserves, I'm fine with that. They should be doing that to meet those liquidity requirements.

And then, second, in terms of rates, I am comfortable moving to the OBFR. Ultimately, I'd like to see more work done on GLOSTR, starting with a different name. [Laughter] "Bank rate" sounds pretty good. I'm sure we can come up with something shorter than GLOSTR. But I'd like to see exactly how this will be implemented, either the OBFR or GLOSTR, or the new name for GLOSTR. Does that mean that the New York Fed is going to have to be working in all of these different markets concurrently to manage this, or will it be easy to manage? And I'm encouraging us to pick something that would be easy to manage, require relatively less intervention in these various markets. So I'm sure they have already thought about this. I would just welcome seeing that kind of work. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. Governor Brainard.

MS. BRAINARD. Thank you. I appreciate the staff analysis and the opportunity to deliberate on the framework that will govern the supply of reserves as our operating framework converges to its new normal. It has been about a year and a half since we discussed these issues, and since that time we have seen a well-telegraphed and executed commencement of balance sheet roll-off.

This year, as runoff has moved to its target pace, we have seen some tightening of the spread between the top of the target range and our policy rate, and this has inevitably raised questions about whether the demand for reserves is much greater than our earlier projections had anticipated—although other factors, such as the volatility and Treasury bill issuance, have complicated this picture considerably. The Committee's deliberations last time around suggested there was substantial support at the time for maintaining the current floor framework, in which reserves would be abundant and the target interest rate would be close to the administered rate.

There is much to recommend the current abundant-reserves framework. It obviates the need for open market operations and the attendant volatility in normal circumstances. It is relatively simple to implement, and it has some attractive qualities in periods of market stress. In particular, because reserves are kept sufficiently high that our policy is implemented on the relatively flat portion of the demand curve, fluctuations in the quantity of reserves demanded don't put much pressure on short-term interest rates. So it enables us to attain interest rate control. Moreover, and importantly, it enables us to separate liquidity provision from interest rate control in times of stress. A system of abundant reserves remains the preferred framework, in my view, for these reasons.

The minimum level of reserves needed for the efficient and effective implementation of monetary policy in a floor system depends on the structural demand for reserves and short-term variability in the supply of and demand for reserves. And it's difficult to know precisely how low reserves can be allowed to drop while still maintaining effective interest rate control. In our 2017 discussion, staff analysis suggested that regulatory changes and a heightened sensitivity toward risk on the part of financial institutions may have increased reserves demand to a level between perhaps $500 billion and $750 billion. Most recently, using a survey of the demand for reserves, the staff's estimates suggest a level of around $800 billion but with a wide confidence band around it. Taking into account a buffer suggests a target of perhaps around or somewhat above $1 trillion. Such a level, while higher than pre-crisis levels, is much smaller than the peak level of reserves reached several years ago.

All else being equal, I am inclined to prefer providing clarity to the public about both the preferred operating framework and the target size of reserves. If we had a high degree of confidence about our estimates of the demand for reserves or our ability to control rates during the transition, I would be inclined to choose a target level of reserves designed to be on the flat part of the curve and steer toward it transparently. I would actually appreciate it if the staff could flesh out such an option for our consideration, along with its pros and cons. In this case, we may need to be open to additional mechanisms to assure effective interest rate control, at least during the transition, such as a facility of the type that was described earlier. But recent experience has introduced a cautionary note that the demand for reserves may be materially greater than the high end of our estimated range. In light of the possibility that an abundant-reserves regime may require such a materially high level of reserves, we may instead want to continue refining our normalization strategy as we learn more about the structural demand for reserves. Although, again, my preference is for an abundant-reserves framework, I am certainly willing to remain open minded about moving to a scarce-reserves framework if this occurs at a much higher level of reserves than had been anticipated and if we can figure out the appropriate mechanisms to ensure interest rate control.

Along with the operating framework, as the memos point out, it's also, before too long, going to be important to consider and communicate publicly our plans with regard to the chosen interest rate for our target range. Of course, the simplest, most appealing approach would be simply to set the policy rate. Unfortunately, however, it doesn't appear that the Board can delegate to the FOMC the responsibility for setting the IOER, which makes it unsuitable for this purpose.

In my mind, the relatively high volatility of repo rates makes them less attractive than the funds rate or Eurodollar rate, as they are more likely to breach any given target. By extension, the so-called GLOSTR proposal, apart from its unattractive name [laughter], would also share this feature. Indeed, the prospect that open market operations may be needed under the GLOSTR proposal in order to keep these rates within the target range would seem to undermine one of the key advantages of an abundant-reserves regime.

There remains a decision on whether to shift from the federal funds rate to the OBFR measure. Sticking with the federal funds rate has an obvious advantage in terms of continuity of communications. But with the funds rate now trading very close to the IOER rate, there is a risk that trading in that market could diminish further, leading to greater volatility and a possible separation of the funds rate from other unsecured overnight rates.

Those considerations persuade me, at least, to look at shifting away from the funds rate to a broader and more robust measure, such as the OBFR, which was originally constructed for precisely these reasons. I think the OBFR may present some optic challenges with its inclusion of Eurodollar trading, most of which is offshore in nontraditional financial centers. The current plan is to broaden the coverage. To include domestic wholesale funding might help address this challenge while also adding further robustness to the money market activity associated with it.

In short, there is no single ideal solution. My preference, which is not strongly held, would be to stick with the federal funds rate for the time being, at least until the broader measure of the OBFR is ready. Thank you, Mr. Chair.

CHAIRMAN POWELL. Thank you. Vice Chair Williams.

VICE CHAIRMAN WILLIAMS. Thank you, Mr. Chair. In a break from my practice, I will directly answer the questions posed in the memo. [Laughter] Before I do so, I would like to add my thanks and appreciation to the staff across the System who contributed to this analysis, the memos, and the excellent briefings today. They have all been very helpful in my thinking through these complex issues, although I have to admit, in all of that preparation for this meeting, I realized in listening to this group that I had a different understanding of one of the key issues. I had assumed all along it was pronounced "glow star." [Laughter]

I have to apologize in advance for the length of my remarks. This is an obviously important issue. But I did go through my remarks prepared for the next two days, and I aggregated up the length of them. In sum, I believe my remarks lie well within the target range. [Laughter] Okay. Let me start with the current system, and then I'll turn to limited reserves. And I'm going to repeat, not surprisingly, a lot of the excellent comments we have already heard. I believe the current abundant-excess-reserves system has a number of benefits in terms of interest rate control, financial stability, and operational resilience. And I think it is important for all of us to note—and I think a few people mentioned this—that these benefits were not fully appreciated a decade ago when the scarce-reserves system was in use.

Let me start with each in turn. First and foremost, like others, I would highlight that the current system has proven highly effective at delivering interest rate control. Looking ahead, I am confident that this system—perhaps with a few tweaks along the way—will continue to deliver consistent, effective control over the policy rate in a wide range of circumstances. And, importantly, this includes situations in which we need to increase the size of the balance sheet significantly, whether to add liquidity or to make asset purchases.

Second, the current system supports financial stability. Although the LCR treats different highly liquid assets as substitutes, from a financial-stability perspective, central-bank-issued reserves do have advantages over Treasury and agency securities. In particular, a large amount of excess reserves better positions the banking system to meet a surge of outflows in a stressed environment. That surge would otherwise have to be met through the sale or repo of potentially enormous amounts of Treasury or agency securities on short notice. Reserves can be used immediately, without contributing to fire-sale dynamics or market disruption. In addition, the current system provides the U.S. Treasury with greater flexibility in managing its deposit account at the Federal Reserve. This provides a cushion for the Treasury in the event of potential disruptions to market access such as natural disasters or cyber events, giving them more time to recover from such risk events. This, in turn, lowers the risk of a technical default occurring as a result of such events, and that supports the efficient functioning of markets and financial stability.

And, finally, under the current framework, daylight overdrafts have been lower and payments are settled earlier in the day, and that reduces operational risk. Similarly, operational risks regarding monetary policy implementation are quite low under the current system.

Now, the biggest tradeoff posed by the current system concerns the potentially large size of our balance sheet needed to support it. If the demand for excess reserves is extremely high, we may not be able to shrink the balance sheet in a way that convincingly demonstrates that we have unwound the balance sheet programs that we instituted following the crisis, and that could undermine our credibility and support for future asset purchases.

In the best of all worlds, we will be able to reduce the size of the balance sheet considerably while keeping the supply of reserves sufficiently large to maintain the current framework and preserve the associated benefits. Facing the staff's baseline assessment in the recent survey of senior financial officers, we will be able to reduce the supply of reserves by nearly two-thirds from its peak of $2.8 trillion back in 2014, and that remains my baseline projection as well. That said, prudence requires that we consider the alternative case in which the demand for reserves is much higher than expected, and that's true irrespective of what our ultimate goal is in terms of an abundant- or scarce-reserves system. And this scenario does put us in a more challenging situation.

Now, to be clear, we have the tools that could be used to reduce the demand for reserves, but they do carry some costs. The most direct way is to penalize holders of reserves by setting the IOER rate well below market rates. Over time, banks would adjust to this by reducing desired reserves. Similarly, we could communicate supervisory expectations to place less reliance on holding reserves relative to other HQLA. But the obvious costs of these approaches is that we would be giving banks an incentive to economize on holding an asset that has unique positive social value arising from both microprudential and macroprudential perspectives. If we find ourselves on this path of driving down reserves below what banks would otherwise hold, the transition could be rocky. The variability of autonomous factors, including those arising from the Treasury's account, that affect the supply of reserves will be far greater than before the crisis.

Similarly, the demand for reserves is likely to be more variable than before, as banks adjust their holdings in response to internal stress testing and regulatory requirements. As a result, it may prove harder to control the policy rate within a narrow range on a consistent basis. Indeed, in order to have a high degree of confidence in interest rate control in this type of environment, it will likely be necessary to set up some type of standing repo facility to put an upper bound on rates. The lending rate at this repo facility could be set at a positive spread to

IOER, say, at the top of the policy range. And, over time, as banks' business models adjust to this arrangement, the administered rates provide incentives. Such a system could provide reasonable interest rate control with a small amount of reserves. However, such a system is not without complications. For one, the standing facility must be devoid of stigma; otherwise, it will be ineffective.

In addition, there is a tradeoff between control of interest rates and the control of the size of the balance sheet along this transition. For example, a narrow spread between the rate on the facility and the IOER would provide tight rate control, but banks would have little disincentive for borrowing from the Federal Reserve, and take-up of the facility could actually be quite large. In contrast, a wide spread would limit take-up of the facility but could be associated with more interest rate volatility. And this illustrates what I think is a paradox of the problem that we may face. And that is, in an attempt to reduce the size of our footprint in money markets by reducing the amount of reserves, it could well increase our footprint in terms of take-up of the standing repo facility.

These comments aren't meant to argue, in any way, that we could not return to a system of scarce reserves. I am confident that we can make the system work. However, getting there would require a lot of preparation, including introducing likely a new facility with a broad set of counterparties and extensive communication, and the transition may not be as smooth as we like and require a number of adjustments as we learn more along the way.

In summary, the current system works well and has a number of important advantages that I would prefer to preserve, if possible. And, on the basis of our current understanding, it appears likely that we can both reduce the size of the balance sheet considerably and preserve the benefits associated with our current approach. It may require some temporary tools to help achieve this, but we will continue to learn about the demand for reserves over coming months and should get a clearer view of the tradeoffs associated with these approaches.

In terms of the interest rate, I think that, like many, I am going to lean to favoring the OBFR. In summary, I don't think the economics make a strong case for one of these rates over the other. Short term interest rates tend to move very closely over time, in most circumstances.

I do think there are three considerations in thinking about our policy rate. One is the robustness of the rate, the second is ease of communication, and the third is governance. The effective funds rate, I think, has been a good measure of short-term funding costs in the past, but it does fall short on this robustness criterion. As has become all too evident, this is becoming an idiosyncratic market dominated by lending by Federal Home Loan Banks. And, by design, the OBFR captures a much broader set of transactions and, therefore, is superior to the funds rate in terms of robustness. I also think, from the point of view of communications, switching from the effective funds rate to the OBFR would be pretty straightforward. In terms of a general level of short-term rates, I do think this begs more questions than it answers. Short of specifying an index of rates, targeting a general level of short-term rates does seem to be a step back in transparency from where we are today, and I think that's problematic. Finally, turning to governance: There are advantages of having a clearly measured market rate as a policy rate, due to the divided governance of our IOER and other administered rates. In that regard, I think the current system works well. The Committee sets the target range for a market rate, and the administered rates are aligned to best achieve that decision.

In a perfect world, I would hold off on making a change in the policy rate until we have clarity on the operating framework. That's been my preferred course, up to now. However, I fear the federal funds rate is getting creakier with every passing day, and that has undermined its usefulness as the policy rate. If this continues to worsen, we may need to replace the funds rate with the OBFR sooner rather than later, and I think the OBFR would serve us well. Thanks.

CHAIRMAN POWELL. Great, thank you. And let me start by saying I, too, found the memos not only very well done but also concise—short, even—and I commend you for that.

To begin with the question of the operating framework: What I'm hearing is that, first, the current operating system, in which reserves are abundant, is attractive to many and acceptable to all, subject to a second consideration, which is held by most of us, and that concerns the ultimate size of the balance sheet, which we will learn much about in the next year or so as the balance sheet shrinks. Let me try to talk about those two issues separately.

Starting with the framework, like others, I see the current system as having many attractive characteristics. We've had excellent control over short-term rates both during normal times and in times of market turmoil. We've also had the flexibility to respond to changing market conditions, as our recent technical IOER adjustment demonstrates. It's a relatively simple system, in which we effect interest rate control through changes in the administrative rates. Finally, a system with abundant reserves implies greater liquidity in the financial system—a desirable feature.

Bottom line: The current system has clear advantages over a system in which reserves are scarce and in which the funds rate is adjusted using frequent open market operations. At a minimum, the scarce-reserves system raises many questions. For example, operating a system involving scarce reserves would likely be considerably more complicated than the current regime, particularly if regulatory demands for reserves prove to be volatile. Open market operations could be many times larger than in the pre-crisis period, and interest rate volatility could be higher. And, of course, any future use of asset purchases could put us right back into a floor system.

Although I do prefer a system with abundant reserves with a much smaller balance sheet than the one at present, like others of you, I do not see a return to a system of scarce reserves as out of the question. In fact, I think it's useful to keep it alive in our minds as a possibility for now, even if not a preferred alternative. And there could be ways to address some of the concerns about a system involving scarce reserves. We could, for example, discover that the demand for reserves is lower than current estimates because banks actively seek to substitute out of reserves into higher-yielding liquid assets. We could also take steps to damp the daily fluctuations in the supply of reserves, for example, by coordinating with the Treasury to limit the volatility of the Treasury General Account.

The scarce-reserves system could have one particular attraction that some have noted, and that is, in principle, it would constitute a complete round-trip to the pre-crisis era, in the sense that reserves would again be scarce. QE still leaves some people uncomfortable, and, where possible, we would do well to take steps to address their concerns.

A return to reserves scarcity could lend some further legitimacy to asset purchases as a tool in the future, as it would show that QE is not just a one-way street to an ever-larger balance sheet. Of course, that is speculative and a matter of degree. If we can accomplish a large balance-sheet reduction under the floor system, the marginal benefit of making a further reduction in moving to scarcity might not be that large. A smaller balance sheet also implies more policy space, conditional on a particular maturity profile of assets. Of course, you can also assume a fixed balance-sheet size and then create policy space by shortening the maturity. But both maturity profile and balance sheet size are in the toolkit.

And that brings me to the second issue: the ultimate size of the balance sheet. Ideally, the Committee would know with some confidence the rough size of the demand for reserves—and, hence, the balance sheet—before making a definitive choice between the two regimes. Our normalization principles say that the balance sheet, once normalized, will consist primarily of Treasury securities and will be no larger than necessary to conduct monetary policy efficiently and effectively within our chosen operating framework. And I think we need to take that language seriously and be seen to work hard to reduce the size of the balance sheet as much as possible within our chosen regime.

The demand curve for reserves is uncertain today, but it should reveal itself as normalization proceeds. Let’s assume for a moment that we would need about $1 trillion in reserves in an abundant-reserves system, including the buffer, in keeping with market surveys and the staff estimate. That would mean a further reduction in reserves of roughly $800 billion, which would be complete within about two years. The total balance sheet size, at that point, would be almost $3½ trillion—a substantial reduction of about $1 trillion from its peak size. Now, that’s a pretty big balance sheet. I think we could get that thing into the garage [laughter], but I would prefer a smaller model, if possible. And I’d like to see us explore ways to reach an even smaller balance sheet. But I would say, if we used all of our tools and that’s as small as it could get, then I think I would see that case as an attractive outcome, and it sounds like that view is widely shared on the Committee.

If we were to assume instead—I suspect counterfactually—that demand for reserves in a floor system turns out to be substantially higher than we think, we’d be left with a materially larger balance sheet. In that case, the first step would be to take measures to lower the demand for reserves, for example, by introducing facilities to make it easier for banks to monetize their holdings of Treasury securities in times of stress.

If, however, the required balance sheet size were to remain much larger than the staff's main estimate, this would at the margin, for me, increase the relative attractiveness of a scarce-reserves system and also the importance of finding additional ways to reduce and stabilize reserve demand and supply factors consistent with our other goals. Again, I don't expect or like this outcome, but I don't think we can rule it out today.

On the framework decision, it seems to me that the right message for today is that we have confidence in our current operating system. We believe that this system is working well and that it has attractions for the longer term. So there is a strong presumption that we will keep the current system subject only to learning more about the demand for reserves.

Let's turn to the question of the target rate and assume for the moment that we're in an abundant-reserves system. A good number of you share the concern expressed in the staff memo about the longer-run sustainability of the federal funds rate in such a system. And I share that concern. In a system of abundant reserves, there is clearly a risk that the Federal Home Loan Banks—the predominant lenders in this market—could turn to alternative forms of short-term investment. And, indeed, we've already seen a bit of that. The funds rate could lose its significance as a broad indicator of banks' funding cost, and now is the right time to be looking at alternatives, in my view.

I think the most straightforward step would be to move from the federal funds rate to the OBFR, whose market has about double the volumes of the federal funds market but closer to triple when we add the additional domestic wholesale deposits next year. We've been reporting the OBFR for two years now, and I am confident that we could move fairly smoothly to the

OBFR so long as we follow a carefully thought out and communicated plan. I do understand that it is subject to some extent to the same questions as the federal funds rate, but, nonetheless, it seems far more robust in the near term and a natural path-dependent step.

The memo also looked at GLOSTR. And some of you do find that an attractive possibility. If we did move in that direction, market participants would want to know exactly how we define that word, and one approach would be to create a new rate that captures our view of GLOSTR. The process of identifying components and creating weightings, seeking public input, and then publishing that, and then having the public get to know it—doing that right would take several years, as we saw with SOFR.

The alternative to switching directly to GLOSTR without creating an explicit new rate seems to me to be a bridge too far—although it would have the arguable benefit of creating a lot of gainful employment for Fed watchers [laughter], who would need to interpret what we mean by the term and when short rates are and are not congruent with our intended policy.

A move to a secured Treasury repo rate like SOFR would be a much bolder step. Repo rates are much more heavily traded and not at risk of secular decline. As President Rosengren pointed out, SOFR over time will very likely be the dominant reference rate in derivatives and other financial contracts, and this is one that's worth further reflection. I have to say, I struggle with it: It's one thing to have your policy rate affect the government's financing costs, and it's another thing to target a rate that reflects those costs directly. And it seems to me that it's a tough one to get around.

My bottom line is that I see a strong case for considering a move to the OBFR in the near term. The OBFR is closely related to the federal funds rate, but it captures activity from a much broader cast of lenders. And in coming months, it would be helpful for the Committee to take a closer look at the OBFR, including some careful thinking about what a transition from the federal funds rate would look like.

The OBFR would be a reasonable choice for a target range with either scarce or abundant reserves. Of course, in a scarce-reserves system, the starting point would clearly be the federal funds rate or OBFR. It would be reasonable to expect that interbank trading would return to and be sustained at a high level. The real issue in a scarce-reserves system would be not what weight to choose but how to create and manage scarcity.

I'll wrap up with another word on public communications. I would like the public to see us as continuing with our system of abundant reserves, with the intention to use it indefinitely so long as it proves consistent with a substantial further reduction in the size of the balance sheet. And our communications, I think, should be well calibrated to convey that message.

I will stop there and suggest that we have a coffee break. Thanks for a great round of comments. Let's take 20 minutes—back at 3:20.

[Coffee break]

CHAIRMAN POWELL. Okay. Our second agenda item is the Desk report. Over to you, Simon.

MR. POTTER.[2] Thank you, Mr. Chairman. First I'll begin with a short update on markets following the midterm election. As generally expected by election forecasts, the outcome of the U.S. midterm elections resulted in split control of the Congress. Price action has been modest and directionally consistent with Desk contacts' expectations in the event of this result: slightly lower Treasury yields in response to a reduced likelihood of additional fiscal stimulus and an increase in risk-asset prices due to the passing of a risk event.

The intermeeting period was distinguished by sharp declines in global equity markets and a notable increase in volatility. As shown in the top-left panel of your first exhibit, the S&P 500, shown in light blue, fell as much as 10 percent over the intermeeting period before recovering somewhat to end the period lower, around 6 percent, erasing its gain year-to-date. Elevated tensions between the United States

[2] The materials used by Mr. Potter and Ms. Logan are appended to this transcript (appendix 2).

and China continued to be cited as negatively affecting risk sentiment over the period, while heightened anxiety around the outcome of Italian budget negotiations and, to a lesser extent, an impasse in Brexit negotiations have been two additional headwinds facing risk-asset markets.

The equity market volatility came against a backdrop of an upward trend in long-dated U.S. Treasury yields, the dark blue line, and longer-run concerns over slower growth outside the United States. These growth concerns have been seen as contributing to the underperformance of advanced and emerging market equity markets since April, as shown by the red and gray lines.

Specifically, contacts appear to have focused on two primary catalysts for the large drop in equity prices that began in early October. First was a notable rise in Treasury yields on October 3, which, according to contacts, precipitated a subsequent reassessment of equity valuations. The move in yields was attributed in part to better-than-expected economic data as well as comments by Chairman Powell that were seen as suggesting a potentially more restrictive monetary policy path and a higher neutral rate. In explaining why yields moved so sharply—the 10-year yield rose 12 basis points on the day—some contacts noted the breach in key technical levels for both the 10- and 30-year tenors, as yields surpassed year-to-date highs reached in May. Although nominal yields have retreated somewhat from their highs, real yields remain notably higher across tenors, as shown by the dark blue lines in the top-right panel.

The second factor widely cited as contributing to the decline in equity prices was a growing focus on downside risks to corporate earnings growth, particularly for next year. These risks include the aforementioned growth concerns and recently imposed tariffs and higher wage costs affecting margins.

Implied volatility on the S&P 500 index, as measured by the VIX index, shown as the red line in the middle-left panel, rose markedly, though to a lesser degree than the volatility spike in February of this year, when the need for abrupt rebalancing by VIX exchange-traded products was a major factor exacerbating market volatility.

The recent increase in equity-market-implied volatility appears more similar to the episodes in late 2015 and early 2016 following the devaluation of the Chinese renminbi and concerns regarding Chinese and global growth. However, that period was associated with a dramatic widening in credit spreads and resulted in a significant tightening of financial conditions. For example, high-yield bond spreads—shown as the dark blue line—rose to over 800 basis points at that time. In this intermeeting period, although corporate bond spreads widened, the move was modest compared with 2015 and 2016, and high-yield bond spreads remain 400 basis points below their levels at that time. On the one hand, this relatively muted reaction is reassuring because many market participants view the large increase in outstanding corporate debt over the past few years—particularly by highly leveraged firms—as having the potential to both produce and exacerbate the next recession. On the other hand, the muted reaction might cause additional flows into corporate debt, increasing the risk associated with this sector. Bill Bassett will be discussing trends and risks in corporate debt specific to leveraged loans in his briefing.

China risks remain at the forefront of market participants' minds for two reasons. First, signs continue to point to a slowing Chinese economy amid the backdrop of increasingly strained U.S.–China relations and the local authorities' ongoing campaign to slow leverage growth. Second, there is increasing focus on the level of the renminbi, which has continued its gradual depreciation against the U.S. dollar for much of the period. As seen in the red line in the middle-right panel, the renminbi has weakened to levels last seen in late 2016, edging closer to the 7 renminbi per dollar level seen by some markets participants as a potential threshold for an acceleration in depreciation pressures. The authorities are perceived to have stepped up intervention in September and October to contain further weakness, and signs of possible progress in discussions between Presidents Trump and Xi spurred some appreciation in recent days. Nonetheless, options markets continue to point to a higher demand for protection against renminbi depreciation relative to appreciation versus the U.S. dollar.

Chinese equity prices, including the Shanghai composite, shown in dark blue, continue to be volatile, down 4 percent over the intermeeting period and 19 percent year to date. Coordinated announcements of support for the equity market coming from various Chinese state agencies temporarily halted the trend decline in prices, but, overall, during the intermeeting period Chinese equity markets performed broadly in line with global equity prices.

I should also note that Mexico's currency depreciated 5 percent over the period and Mexican sovereign yields rose notably, notwithstanding the announcement in late September that Canada had joined the United States and Mexico in agreeing to revisions to the free trade agreement among the three countries. The broad selloff reflected investor unease and reduced optimism about the policy trajectory of Mexico's new government, this concern stemming from the recent cancellation of a major infrastructure project.

The skittishness in global equity markets does not appear to have materially affected near-term U.S. policy expectations, which are, on net, little changed over the period. Contacts noted that the President's continued comments on monetary policy did not have any material effect on policy rate expectations, as further confirmed in the Desk surveys and market-implied measures.

Market pricing continues to suggest a high likelihood of the next rate increase in December. The median of respondent's modal expectations of the target federal funds rate was little changed from September, as indicated by the gray circles in the lower-left panel, and continues to imply an increase in December and three rate increases in 2019 before a slight easing in 2021.

As shown by the light and dark blue diamonds, the average PDF-implied means for year-end 2020 and 2021 were also little changed from the previous survey, but the

PDF-implied mean for year-end 2019 increased to 2.82 percent. The increase in this estimate was likely produced by an adjustment to the structure of the survey question for 2019, and this survey rate is now broadly in line with current market pricing, shown as the dark blue solid line. However, the PDF-implied mean now points to a 55 basis point decline in 2020 and a 21 basis point decline in 2021. While this is markedly different from the market-implied rate path, which only turns down slightly in 2021, the two could be reconciled if there are positive term premiums in longer-horizon futures contracts.

Most respondents did not provide incremental color that would shed light on this decline. But answers given elsewhere in the survey appear consistent with expectations that economic growth would potentially slow in 2020 and 2021. For example, the median dealer's forecast for GDP growth in 2020 decreased 0.15 percentage point compared with the previous survey, to a level of 1.6 percent. Further, in a new question in the survey, dealers were asked to provide a probability distribution around the timing at which the U.S economy next enters a recession. The responses to this question are shown in the lower-right panel, which shows the cumulative probability distribution of the United States entering a recession over the next few years. On average, respondents placed a cumulative probability of around 70 percent on the United States entering a recession by end-2021. This likelihood is similar to the one shown in David Miller's alternative-views box in the June Tealbook and consistent with views expressed by many of our market contacts on the likely longevity of the expansion. I will now turn the briefing over to Lorie.

MS. LOGAN. Thank you, Simon. I'll begin on exhibit 2 with a focus on money markets and operations. Overall, the current monetary policy implementation framework continues to prove effective at controlling short-term interest rates. As shown in the top-left panel, the effective federal funds rate and most other money market rates have stayed within the FOMC's target range, and the spreads between them have narrowed since March of this year.

Over the intermeeting period, the spread between the effective federal funds rate and IOER narrowed completely, as shown in the top-right panel. The narrowing in the spread was initially surprising, as it occurred in just five days—a faster pace than we and market participants had expected.

As we have been observing for some time, the total volume in the federal funds market has declined as the FHLBs reallocated from federal funds to higher-yielding investments such as repo. More recently, we've also learned about the FHLBs shifting investments into another product—interest-bearing deposits at large banks. In sourcing these deposits, banks appear to receive favorable regulatory treatment relative to borrowing overnight federal funds and consequently have an incentive to pay rates above IOER. The middle-left panel shows the trend in FHLBs' money market investments. As shown in the red portion, these deposits have increased to about $15 billion in recent months, equivalent to roughly one-fourth of federal funds volume. Moreover, we understand on the basis of recent conversations with the

FHFA that this trend may pick up, potentially furthering the decline in federal funds volume.

At the same time that FHLBs have been reducing activity in the federal funds market, competition for federal funds lent by FHLBs has intensified. This increased competition is the result of a shift in the composition of borrowers from those seeking to arbitrage the difference between the federal funds rate and IOER to those seeking to borrow in order to improve their LCR. As shown in the middle-right panel, banks that primarily borrow for IOER arbitrage purposes reduced their volumes, shown in light blue, as spreads to IOER narrowed. The remaining borrowers, shown in dark blue, are less sensitive to the spread between IOER and the federal funds rate and are willing to pay rates close to or above IOER. These participants include banks borrowing for a variety of reasons, including funding assets or meeting payments. However, increasingly, the composition of borrowers has shifted toward banks seeking funds specifically from FHLBs because of their beneficial LCR treatment, with this activity growing as some banks have become newly aware of this benefit. As a result, shown in the bottom-left panel, we now see very little trading at rates more than 1 basis point below IOER and an increasing amount above.

Meanwhile, as shown in the bottom-right panel, repo rates continue to be subject to upward pressure arising from the net new supply of Treasury securities, though the upward movements appear to be limited for now by some banks' willingness to forgo their reserves and to lend them into the repo market when there is the opportunity to earn a few basis points above IOER. This is a good sign for the effectiveness of the arbitrage within the current implementation regime and is another indication that reserves remain abundant. I should note that higher repo rates continue to make the overnight RRP relatively unattractive, with participation remaining at very low levels.

As we look ahead, as shown in the top-left panel of your third exhibit, the median respondent to the Desk's surveys—shown in the top section of the table—expects the effective federal funds rate to remain equal to IOER through the end of the year but for the effective federal funds rate to then rise between 3 and 4 basis points above IOER by the middle of next year and remain there through the end of 2019. The median respondent also expects the OBFR, which includes both federal funds and Eurodollar transactions, to change relative to IOER by a similar magnitude, as shown in the middle section, and also remain above IOER from June through the end of 2019.

The expectation of a stable spread between the effective federal funds rate and IOER through year-end is generally reassuring to the staff, who view the effective federal funds rate as likely to remain within the target range through the upcoming intermeeting period. Nevertheless, we remain cautious in this forecast, due to the potential for the factors most recently pulling the federal funds rate up—mainly spilloverdue to Treasury debt issuance and demand to improve LCR metrics—to continue to do so.

As shown in the top-right panel, we expect net bill issuance to increase by roughly $180 billion over the fourth quarter. Because the upcoming increase is smaller in magnitude and well anticipated, in contrast to the increase earlier this year, we do not expect it to have as significant an effect on money market rates—though we do expect some upward pressure.

Additionally, as term borrowing serves as an LCR-friendly alternative to federal funds, there's potential for increased competition to pull up the federal funds rate, particularly as we approach year-end. At current spreads between overnight and term rates, some of these banks indicate that they would pay as much as 4 to 10 basis points above IOER in the federal funds market and potentially more if term rates rose further. Indeed, as shown in the middle-left panel, the three-month LIBOR–OIS spread, which can be viewed as a measure of banks' cost of term versus overnight funding, has been rising, and typical year-end pressures could make it rise further. This could potentially cause more federal funds borrowing at rates above IOER.

Perhaps for these reasons, as shown in the last row of the table of panel 13, the median survey respondent expects the Federal Reserve will make a second technical adjustment to IOER of 5 basis points at the December meeting, moving IOER 10 basis points below the top of the target range. While the recent narrowing in the IOER–effective federal funds rate spread has led to some discussion of a change occurring at this meeting, most market participants continue to view this outcome as unlikely, in light of your previous communications stating a preference for an adjustment coincident with an increase in the target range. In addition, the median survey response points to a third technical adjustment of 5 basis points to IOER by December 2019.

Most Desk survey respondents also anticipate that a further technical adjustment in December would pull down the effective federal funds rate by the same amount. Although the staff also believe an adjustment in December would have this pass-through effect, anecdotally we have heard of some uncertainty regarding this outcome, which may stem from the expectation that Treasury security supply and year-end dynamics discussed earlier, could push rates up at the same time as the downward adjustment.

As presented in the middle-right panel, survey respondents were asked to rate the importance of various factors in influencing the IOER–effective federal funds rate spread between now and March 2019 and between April and December 2019. Changes in Treasury supply, LCR-related demand, and reserve balances were, not surprisingly, rated highly. However, of note, the median survey response indicated expectations that reserve balances would be the most important factor influencing market rates relative to IOER by April 2019.

I should emphasize that even with the latest spread narrowing between IOER and the effective federal funds rate, the staff do not view this as indicative of increasing competition among banks for unmet reserve needs. Staff projections of reserve balances, combined with responses in the Senior Financial Officer Survey regarding banks' minimum desired reserve levels, support the view that reserves should be abundant, in aggregate, for some time, as shown in the bottom-left panel, although there is considerable uncertainty about these estimates. Additionally, looking at an updated set of the markers presented in the memo on recent developments in reserves markets, we have not seen broad-based pressures or any signs that banks' reserve needs have risen further.

Before concluding, let me provide a few operational updates. First, the staff continues to work on a range of reference rate enhancements, including adjustments to make the OBFR more robust. We began collecting an expanded set of transactions through the FR 2420 report on October 1. As shown in the bottom-right panel, onshore wholesale volumes—also referred to as selected deposits—captured by the new collection have averaged $60 billion a day, slightly higher than initial indications. The initial incorporation of the new data into a shadow OBFR suggests that adding selected deposits would increase the total volume by roughly 45 percent and pull the rate slightly lower. The staff currently anticipate going out for public comment on the inclusion of selected deposits into the OBFR in the first quarter, with the expected implementation in the second half of 2019.

Second, with the increase in reinvestment caps to their maximum levels in October, the MBS reinvestment cap was raised to $20 billion, exceeding the amount of MBS paydowns. As a result, the Desk did not conduct any reinvestments and transitioned to the small value purchase framework.

Lastly, as outlined in the appendix, the Desk completed small value testing, which included both rolling over and selling a portion of the Treasury bills purchased in August. Remaining Treasury bill holdings will mature in early November. Thank you Mr. Chairman. We'd be pleased to take any questions.

CHAIRMAN POWELL. Thank you. Questions for Simon or Lorie? [No response] Seeing none, let's touch for a moment, if we can, on the proposed approach to implementing another possible technical adjustment to IOER.

Our expectation is, and the market's expectation is, that another 5 basis point technical adjustment might be appropriate at the time of the December meeting. But we think we need to be ready in case the federal funds rate moves up unexpectedly during the intermeeting period and trades persistently above the Committee's target range.

The contingency plan is that only if necessary, the Board would go ahead and make another 5 basis point adjustment to IOER in carrying out the will of this Committee that the federal funds rate trade well within the target range. As you know, that would be consistent with the role of IOER as discussed in the Policy Normalization Principles and Plans, and we would give all FOMC participants immediate advance notice before such a step. But the key is, we would not intend to schedule another FOMC meeting between meetings to do that.

And, again, this seems, considering the current behavior of the federal funds rate, an unlikely outcome, but just one that we need to be ready for. And, actually, I'd like the minutes to reflect that participants are comfortable with this plan. The minutes will be out in three weeks, and the idea would be that the minutes would reflect that.

There's now an opportunity to comment on this approach, particularly if you are not comfortable with that plan. So I'll ask for any comments, positive or negative. [No response] Hearing none, thanks for your noncomments. [Laughter] I now need a vote to ratify the domestic open market operations conducted since the December meeting. Do I have a motion to approve?

MR. CLARIDA. So moved.

CHAIRMAN POWELL. All in favor? [Chorus of ayes] Thank you. We will now turn to the review of the economic and financial condition, and we will start with Eric, please. Thank you.

> MR. ENGEN.[3] I'll be referring to the packet titled "Material for the Briefing on the U.S. Outlook." In broad terms, the data we received since the September Tealbook did little to alter our assessment of either the underlying trajectory of the economy or its current cyclical position. In particular, we continue to think that economic activity is running above its sustainable level, and that output will move further above potential over the next couple of years.
>
> As shown in panel 1 of the forecast summary exhibit, the October Tealbook projection of real GDP growth of 3 percent this year is a pace little revised from our September forecast and is about 1¼ percentage points faster than our estimate of potential. After the Tealbook was closed, we received the BEA's advanced estimate

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

of third-quarter real GDP, together with some additional data on business spending, auto sales, and foreign trade. Our revised real GDP growth projection—indicated by the green dots—is just slightly higher, on net, in the second half. I should also note that we still judge that the effects of Hurricanes Florence and Michael on the national economy as ending up being relatively small and transitory.

The two employment reports we received since the September Tealbook contained little in the way of material surprises and together suggest that the labor market has continued to tighten. In particular, the September report—which we had before the current Tealbook—implied an underlying pace of payroll growth and an employment-to-population ratio that were both close to our forecast. After the Tealbook was finalized, we received the October employment report. These data came in a little stronger than we had anticipated, with an employment-to-population ratio that was one-tenth higher than our forecast and a somewhat faster-than-expected rate of job gains.

Of course, the BLS's payroll estimates are just that—estimates—and so we continue to look at firm-level data received from the payroll processor ADP to get a more complete picture of employment. Panel 2 plots the BLS's estimate of monthly *private* payroll gains through October, the red line, along with an estimate we construct using ADP's payroll data, the black line. Combining both of these pieces of information with a statistical model, the blue line, yields an estimate of private job gains in October of 235,000, which easily exceeds the pace we think is consistent with an unchanged level of labor utilization.

As shown in panel 3, continued labor market improvements have been broadly shared across racial and ethnic groups, with each group's unemployment rate currently at or below the lowest point reached at the end of the previous expansion. That said, it continues to be the case that there remain persistent unemployment rate differentials across groups despite the tight labor market.

I noted earlier that our view of the economy's current cyclical position is little revised from the September Tealbook. In particular, our judgmental estimate of the output gap—the black line in panel 4—implies a level of actual output in the fourth quarter that is nearly 2½ percent above its potential. This assessment is corroborated by the blue line in the panel, which gives the output gap estimate obtained from one of our statistical filtering models.

Returning to panel 1 up top, our medium-term forecast for real GDP is only a little weaker than our September projection, mostly reflecting the modest tightening in financial conditions at the time of the October Tealbook when it was closed, particularly the lower projected path of equity prices. That said, we continue to expect that real output will outpace potential through next year. As the ongoing removal of monetary policy accommodation acts to rein in spending and production, along with the diminishing effects of recent fiscal policy actions, real output is anticipated to expand at about the same rate as potential in 2020 before slowing to a below-trend pace in the following year. As a result, the unemployment rate—the black line in panel 5—bottoms out at 3.3 percent in 2020 and then edges up to 3.4 percent by the end of 2021.

Panel 6 shows four of the various measures of labor compensation growth that we follow. After the Tealbook closed, we received the BLS's first read on third-quarter compensation per hour—the blue line—along with the ECI for September, the black line, and average hourly earnings given in the October employment report, the red line.

On balance, we continue to see some evidence that labor compensation growth is creeping up, although it's difficult to be certain, in view of how differently these various series can behave and how volatile they can be from year to year. As you know, we tend to put the most weight on the ECI, the black line, in part because it is less noisy than the other available measures. The ECI rose 2.9 percent over the 12 months ending in September—almost ½ percentage point faster than a year earlier—which is broadly consistent with our view that increases in compensation are evolving about as one would expect, in conditions of an increasingly tight labor market, relatively well-anchored inflation expectations, and lackluster trend productivity growth.

The first four panels on the next exhibit summarize the inflation outlook. After the Tealbook closed, we received the monthly PCE price data through September. Over the 12 months ending in September, PCE prices excluding food and energy, the red line in panel 7, rose 2 percent, up ½ percentage point from a year ago.

To provide some additional perspective on recent inflation developments, panel 7 also plots updated estimates of two other measures of underlying PCE price inflation: The orange line gives the Dallas Fed's trimmed mean measure, while the blue line gives an estimate using a factor model that decomposes observed PCE price inflation into a common component—which is plotted here—and a component that reflects idiosyncratic price changes. As you can see, all three measures continue to suggest that there has been an upward drift in the central tendency of the distribution of PCE price changes over the past year.

Looking ahead, we currently anticipate that the 12-month change measure of core inflation, the red line in panel 8, will remain around 2 percent through the first quarter of next year, with total PCE inflation, the black line, running at roughly a similar pace. Our near-term core inflation projection is little changed, as the incoming data have come in about as we expected, although we did make a small upward revision to our forecast to reflect higher tariffs on imported goods.

Similarly, our medium-term inflation outlook, which is summarized in panels 9 and 10, is not very different from our September projection. In particular, we continue to expect that core inflation, panel 9, will be at 2 percent over the medium term, supported primarily by a further tightening in resource utilization and a small updrift in trend inflation. Total price inflation, panel 10, is expected to run one-tenth below core toward the end of the medium term, reflecting a modest projected decline in energy prices.

As you know, the assumed path of the federal funds rate in the Tealbook forecast is notably higher over the medium term than the Committee's median assessment of the appropriate path of the funds rate. Panel 11 shows the situation as it stood at the time of the September FOMC meeting—the most recent meeting for which a set of SEP medians is available—with the solid line giving the Tealbook funds rate path at that time and the open circles giving the median SEP rate path. Importantly, small differences in economic projections—in particular, for core inflation and the output gap—don't appear to explain much of the current difference between these policy rate paths: If we feed the SEP medians for core inflation and an inferred measure of the output gap into the inertial version of the Taylor (1999) rule used in the Tealbook, the resulting path, the dotted line, is only slightly different from the Tealbook path. The SEP had a slightly narrower unemployment rate gap—and thus a slightly narrower inferred output gap—than in the Tealbook, and the core inflation projections were the same.

Panel 12 notes a few possible explanations for the different funds rate paths. First, the implicit rule underlying the SEP medians could be different from the staff's assumed rule. But that can't fully explain the difference, because if the staff were to change its rule to generate a lower funds rate path, our economic projection would strengthen in response. Second, the staff could be assuming greater underlying strength, or momentum, in aggregate demand; this could imply that a higher funds rate path is necessary to yield an economic projection similar to the SEP median. Finally, the economy could be more sensitive to changes in interest rates than assumed in the staff baseline. The next exhibit uses FRB/US model simulations to illustrate some implications of these points.

The black lines in the four panels show the October Tealbook baseline for the funds rate, the unemployment rate, core inflation, and GDP growth, which are not significantly different from those in September. The red lines in the top left show the economic outcomes if the SEP funds rate path is exogenously imposed on the staff economic baseline, with the funds rate beyond 2021 assumed to be moving gradually toward its longer-run normal level of 3 percent. With the lower funds rate path, the unemployment rate, the top right, is much lower, core inflation is noticeably higher, as shown in the lower left, and real GDP growth, the lower right, is faster than in the baseline. These deviations from our baseline also could be interpreted as illustrating the greater underlying momentum in the Tealbook forecast than in the SEP median.

Although there could be many explanations for greater underlying strength in the staff forecast, one possibility is that the staff forecast assumes that the economy is less sensitive to interest rate increases than implicit in the SEP. The blue lines show the results of an alternative simulation, which was presented in the recent Tealbook, called "Greater Interest Rate Sensitivity." This simulation is based on the assumption that the economy is roughly four times more sensitive to a change in the funds rate than in the baseline FRB/US model. As a result, the funds rate—in the top left—

doesn't have to increase as much as in the baseline to move the economy toward its sustainable levels; indeed, the funds rate path in this scenario is close to the SEP median path. However, the path of the unemployment rate is much higher, core inflation is lower, and GDP growth is slower over the medium term than in the baseline or in the SEP. Although the assumption of greater interest rate sensitivity can deliver a path of the funds rate similar to the SEP median, it also leads to an economy that is materially weaker.

A key point revealed by these simulations is that while using a different policy rule leads to a lower funds rate path, it also strengthens the projected economic outcomes and so doesn't provide a complete explanation for why the staff's assumed fund rate is different from the SEP median. Likewise, assuming that the economy is more interest sensitive can, under the staff's assumed policy rule, generate a funds rate path close to the SEP median, but now with a weaker economic projection than the SEP median. Finally, the explanation that the staff has an economic projection with more underlying strength than in the SEP goes together with the recognition that we are following different policy rules. But exactly why our forecast has more underlying strength than that of the SEP median is still hard to determine without a better understanding of the forces shaping the median SEP outcomes. I'll now turn over our presentation to Beth Anne.

MS. WILSON.[4] Thank you. Markets have been handing out more tricks than treats of late as Simon just described, and the global narrative has turned a little rockier since last Halloween. But working out why and what signal to take for our international forecast has been challenging. In this briefing, I will abandon holiday themes in honor of the classics and, more importantly, discuss how developments in all three pillars of the global economy—the United States, Europe, and the emerging market economies led by China—are affecting our assessment of the baseline and the risks.

First, as shown in slide 2, in the United States, against a background of strong economic performance, as Eric just described, policy normalization is proceeding apace and interest rates are projected to rise materially more, with the dollar strengthening commensurately. In addition, U.S. trade policy remains highly uncertain. At times over the intermeeting period, all three of these factors have rattled markets and stoked fears abroad.

In Europe, slide 3, the possibility held out at the end of the year of a region ready to burst into song after years of restrained performance has not been realized. Instead, incoming data have persistently disappointed, as indicated by the series of revisions to real GDP growth projections made by outside analysts, on the left, and to our own forecast, on the right. Moreover, this year has again seen an intensification of the political tensions that have plagued the region—especially Brexit and fiscal stresses in Italy, or "Britaly." [Laughter]

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

I'll begin with Brexit (slide 4). Market turmoil following the 2016 Brexit vote quickly gave way to a long bureaucratic slog to rewrite the U.K.–EU relationship. But, as seen on the time line, the separation date is fewer than five months away—effectively less if you are a stickler for proper procedure—and the parties seem far apart, particularly on the thorny issue of Northern Ireland.

In our baseline, we assume a last-minute scramble, European style, averts a sudden, harsh "no deal" Brexit. This outcome would involve some nail-biting, down-to-the-wire maneuvering and prolonged uncertainty but would avoid the significant disruptions in trade and finance. This is far from a foregone conclusion, however. Betting markets, for what they're worth, are putting close to even odds on a no-deal Brexit, and in exchange markets, investors are paying up for protection against downside moves in the pound.

Should a sudden no-deal Brexit occur without sufficient stopgap measures in place, the effect of uncertainty on investment and consumption, disruptions to trade, and lack of clarity over cross-border financial arrangements could notably depress U.K. growth—our best guess is shown on the right—and it could raise financial-stability risks.

On the continent, as presented in slide 5, the risks posed by Brexit are less salient, but Italy has stepped up to fill the void. Italy is suffering from chronically weak growth, a load of debt, and perpetually unprofitable banks. Italy's debt-to-GDP ratio, seen on the left, rose sharply over the past decade to about 130 percent of GDP, more than double the goals laid out in the EU's stability and growth pact. The new government, with the support of an austerity-tired populace, is now playing chicken with the EU over adherence to fiscal rules. The current budget proposal is one that we anticipate will keep the debt ratio around current elevated levels, as indicated by our baseline forecast. Moreover, with plausible increases in interest rates or declines in growth, the debt trajectory starts to look unsustainable.

This would not only be dangerous in its own right, but also because Italian banks, which are none too strong to begin with, own one-fifth of the country's over $2½ trillion stock of government securities and would suffer greatly if those assets were compromised. Indeed, likely reflecting these fears, domestic political developments since the Italian election have driven Italian banks stocks down and notably widened bank CDS spreads.

Struggles in Italy would likely reverberate across global markets, as it is the third-largest country in the euro area, the world's third-largest issuer of sovereign debt, and home to a G-SIB. Although U.S. direct exposure to Italy is limited, rising stresses there would undoubtedly ruffle financial markets, especially if the rhetoric turns increasingly anti-EU, anti-euro, reigniting fears of a euro-area breakup. In our baseline, we expect the situation to work itself out, but not without bouts of market stress and a hit to Italian and euro-area growth.

The EMEs are the final pillar in the global economy. In China, slide 6, recent deleveraging efforts have led to a deceleration of growth, the strength of which has surprised the government and spawned fiscal and monetary stimulus in response, with potentially more to come. The manufacturing PMI is down, with new export orders, on the left in pumpkin, tanking and retail sales growth, in sweet potato, taking another turkey leg down. Holiday references die hard. [Laughter] So far, the effect of U.S. trade policies has been limited, but could loom larger. As seen in the Pac-Man pie charts, tariffs implemented to date, the orange area, affect roughly one-half of Chinese exports to the United States and three-fourths of imports. These tariffs by themselves should only slightly lower Chinese output. Should measures expand to encompass all Chinese exports to the United States, as threatened, we could expect ¾ percentage point hit to the level of GDP. And as Simon just discussed, such fears are putting downward pressure on the Chinese currency and stock market.

Slide 7 shows that even without the negative effect of broader tariffs, we see Chinese growth slowing in our baseline. Should a trade shock hit, with the increasing connection between Chinese and EME performance over the past decade—as shown by the coefficients on Chinese growth in the rolling regressions on the right—weaker growth in China would slow broader EME performance as well.

In slide 8, EMEs are at risk not just because of slowing in China. From the beaches of Bali to the front pages of the *Wall Street Journal*, concerns are mounting about the effect of rising U.S. interest rates on prospects for emerging market economies. The experiences of the 1980s and ’90s, when EME crises followed on the heels of U.S. monetary tightening, still resonate. But investors should take some comfort from later episodes. Indeed, not every tightening cycle leads to EME crises or even a slowdown in EME growth, as can be seen by comparing the number of rust and green boxes in the table. Moreover, the plot to the right shows the difference in cumulative capital inflows to EME countries from two years before to two years after the start of a Fed tightening. Except for a few extreme cases, most countries do not experience sizable capital outflows at the beginning or even into U.S. tightening cycles. A careful review of the historical evidence, as was done in the memo just sent to the FOMC, suggests two important factors mitigate the effects of Fed tightening abroad: first, if rising U.S. interest rates are in response to strong U.S. growth and, second, if EMEs are relatively sound.

That said, in the Tealbook we have the policy rate rising to 4¾ percent by the end of the forecast period, about 150 basis points above that of the median SEP projection and the Blue Chip consensus. So, as raised in the next slide, it is worth asking what effect the Tealbook interest rate path might have on EMEs.

To address this question, we designed a model that distinguishes between more and less vulnerable EMEs—call them emerging Asia and Latin America, respectively—and including the AFEs and the United States. For vulnerable EMEs, we allowed currency depreciation against the dollar to boost long-run inflation expectations and to adversely affect private-sector balance sheets, raising borrowing costs. Using this model for our simulations, we first assume the Blue Chip consensus as our starting point. We then add positive shocks to U.S. aggregate demand sufficient to generate the staff Tealbook forecast for the unemployment rate—a forecast that endogenously entails higher U.S. policy rates—and examine the effect of these shocks on foreign economies.

As seen in your next slide, compared with market expectations as captured by this Blue Chip baseline, the higher path of interest rates implied by the Tealbook forecast pushes down the currencies of all three regions, on the left. Currency moves, along with higher U.S. demand, boost trade balances. But long-term interest rates, shown in the middle, also rise, especially in Latin America, as inflation expectations move up. The net effect is to raise GDP, shown on the right, for the AFEs and emerging Asian economies and modestly reduce it for vulnerable EMEs.

Should U.S. policymakers also need to respond to upward surprises in inflation, not shown, the negative interest rate effect on the foreign economies would be stronger, and the net effect for all regions would turn negative.

All told, U.S. policy tightening so far and slated in the Tealbook should probably have only a modest effect on most foreign economies. But more vulnerable economies—those with high debt and deficit levels, high inflation, and significant dollar-denominated debt—may fare more poorly, as we have already seen for some.

As much of the negative effect of our tightening depends on how vulnerable EMEs are, your next exhibit provides a quick look at this. One summary measure, our EME vulnerability index, shown on the left, has certainly increased, but remains well below the 1990s levels. More broadly, the update of our International Financial Stability Matrix sent to you last month suggests no increase over the past year in vulnerabilities, with the overall rating, shown in the table at the bottom right, remaining moderate. Indeed, equity valuation pressures have lessened. However, a number of EMEs have notable or elevated vulnerability, and some countries, including the ones I discussed earlier, have more elevated proximate risks. This suggests that for select economies, U.S. interest rate surprises could be costly.

Where does this all leave us in terms of our baseline? Frankly, as seen in the next slide, with a "peaceful (qu)easy feeling." We have foreign growth relatively stable and near potential. But the stresses in AFEs and EMEs, discussed previously, are taking a toll. As you can see, our foreign outlook, although a positive one, has changed little over the past year despite a sizable increase in our expectations regarding the United States. And with that, I will turn it over to Bill Bassett for an update on domestic financial stability.

MR. BASSETT.[5] Thank you, Beth Anne. I'll be referring to the materials titled "Material for Briefing on Financial Stability Developments." The recent increase in equity market volatility has, so far, led to limited spillovers to other markets, and we are unaware of related stress on key financial institutions. This is consistent with our

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

judgment that overall financial vulnerabilities are moderate. That assessment reflects still-elevated asset valuations, moderate overall debt loads in the private sector, strongly capitalized financial institutions, and low levels of vulnerabilities stemming from maturity and liquidity transformation.

I will first review our assessment that asset valuations and investor risk appetite remain elevated. An estimate of the equity risk premium, shown in chart 1–1, is around the 20th percentile of its historical distribution. As shown to the right, spreads on investment-grade and high-yield bonds moved up only about 15 basis points and 30 basis points, respectively, in October, changes that are barely perceptible to the naked eye. In property markets, we continue to believe that valuations for commercial real estate, not shown, are stretched. Over the summer, we showed that residential property prices had moved noticeably above the level implied by their long-run relationship with rents—suggesting that housing valuations warranted heightened scrutiny. As shown in chart 1–3, all three of our usual metrics suggest that house prices continue to increase but now appear to be decelerating. That development is consistent with recent softening in housing markets more broadly. But we are keeping a close eye on valuations in this sector.

Although vulnerabilities associated with household leverage remain low to moderate, the high level of business sector leverage appears to be a significant vulnerability. Total debt growth in the business sector has been running somewhat faster than growth in nominal GDP for several years, and the ratio of sector debt to GDP, shown in chart 1–4, is near the top of its historical range. Furthermore, the average quality of this debt is likely deteriorating. Net issuance of risky debt, shown by the black line in chart 1–5, has picked up and has been driven by leveraged loans, the blue bars.

Also, underwriting standards in the leveraged loan market appear to have worsened. The share of deals with total-debt-to-EBITDA ratios above 6 increased in the third quarter to its highest level in several years, and a larger share of those deals reportedly are using an expansive definition of earnings, such as earnings including expected cost savings coming from mergers. In addition, the industry has moved toward covenant-lite loans, which now make up a large majority of overall issuance, and those have had significantly lower recovery rates in recent years than loans with stronger covenants. Thus, some market participants have warned that overall recoveries may be lower than expected should defaults rise.

The prospect of higher-than-expected losses on these loans raises the question of who is holding them and whether knock-on effects to these investors are possible. About 60 percent of leveraged loans are held by CLOs, line 1 in table 1–6, which do not feature material liquidity mismatch, and we are not hearing reports of a deterioration in the structural characteristics of these vehicles. However, as the structures now hold riskier loans, the potential losses to investors in the CLOs themselves is also a consideration. Available data indicate that investment-grade tranches are largely held by banks and long-term investors, while hedge funds hold significant portions of the lower-rated tranches. The Federal Reserve's stress tests account for direct exposures of the largest banks to these institutional term loans, line 2, as well as any related credit lines or CLO debt. Moreover, available data suggest that banks are managing syndication pipelines much more tightly than they had been a decade ago, and they are better capitalized to absorb a hit to earnings or an unexpected balance sheet expansion if values decline and the pipeline clogs. More concerning is the share of leveraged loans held directly by open-end mutual funds—line 3 of the table—which has risen to 21 percent. Such funds have significant liquidity risks, as they offer investors the right to redeem shares daily, while the loans they hold take much longer to sell.

For financial leverage, the staff continue to judge vulnerabilities as low. As shown in chart 2–1, common equity-to-asset ratios of U.S. BHCs are historically high, importantly reflecting new regulatory capital standards and, at the largest banks, the effects of the stress-test regime. As for nonbank financial institutions, capital ratios of broker-dealers and insurance companies, not shown, also remain near their higher post-crisis norms.

Most measures of hedge fund leverage, however, suggest it remains near post-crisis highs. Although many of those indicators are somewhat narrowly focused, our most comprehensive measure also points in that direction, but it is available only through last December. As shown in chart 2–2, the SCOOS—which is comprehensive and more timely but focused on changes—suggests that hedge fund leverage likely did not abate over the summer.

The staff's assessment of low vulnerabilities arising from financial leverage pairs with our similar view of vulnerabilities due to maturity and liquidity transformation. A key determinant of our assessment of this vulnerability has been the continued stability of the funding sources at large banks. Throughout this tightening cycle, we have been closely monitoring banks for signs that deposit flows are changing or becoming more sensitive to increases in interest rates on alternative investments, in part because those developments could precipitate an increase in the use of short-term wholesale instruments to fund existing balance sheets and future growth. However, as shown by chart 2–3, to date, rates on a representative insured time deposit have risen only 10 to 40 basis points across the bank-size spectrum even as the federal funds target range has increased 200 basis points. Meanwhile, core deposits, the red line in chart 2–4, remain a historically high fraction of bank funding. The stickiness of deposits and their rates through this stage of the tightening cycle is one factor, along with the new liquidity regulations, explaining why the share of short-term wholesale funding, the black line, has not risen much, if at all, above post-crisis lows.

Approaching two years after the implementation of money fund reforms, growth in alternatives to prime money funds, shown in chart 2–5, remains modest, reinforcing the staff's view that those reforms have materially enhanced stability in this sector. On the other hand, outstanding high-yield bond and loan mutual funds, not shown, have trended up over the past several years. This suggests that maturity and liquidity transformation associated with such funds is now higher than in previous cycles.

Additionally, the QS Assessment highlighted that LIBOR panel banks have agreed to continue submissions only through the end of 2021 and that the industry has transitioned only a small fraction of the $200 trillion USD LIBOR market to alternative reference rates. Through the Alternative Reference Rates Committee, the Federal Reserve is actively involved in the effort to promote one such alternative, the Secured Overnight Financing Rate, and is engaging with the industry to explore solutions for legacy LIBOR contracts.

The third exhibit provides an overall summary of the staff's assessment of key vulnerabilities.

That concludes the staff's prepared remarks. We're happy to take your questions.

CHAIRMAN POWELL. Thanks very much. Questions for the staff? President Kashkari.

MR. KASHKARI. Thank you, Mr. Chairman. Beth Anne, you talked about China. In the Tealbook, it mentioned that the United States now has imposed tariffs on about 50 percent of our imports from China, which was a surprise to me. I didn't realize it was that high.

I'm just curious. I would have guessed that if we applied tariffs on 50 percent of imports from China, that would be meaningful, but as yet it doesn't seem like it's had much of an effect on our economy, certainly. I'm just curious if you think about China and the risk of further trade wars. I mean, 50 percent is already a lot. How much worse do you think it can get, or at what size do you think it'll have an effect?

MS. WILSON. Our estimates are that it has had a little over one-tenth on the level of prices and about double that on the level of GDP. If we doubled the amount, then that would obviously double it. So imports are still a fairly small fraction. So if you do a sort of mechanical transformation that gets you there.

The places in which I don't think we've built anything, in particular, is that our strategy has been to stick with what has happened, but you could imagine that there are uncertainty effects that may be weighing on things. There could be production-chain, value-chain effects, intermediate inputs. So I can—Eric may want to speak about how they've taken it on the domestic side, but one could imagine that if this got broader and bigger, that it would have more pronounced effects. But right now, the amount and the goods affected are still fairly contained.

MR. ENGEN. Yes, in terms of our U.S. economic projection, we have followed colleagues in just assuming what has already been implemented, and that we'll take onboard once their tariffs actually got implemented. And so we've followed on from that. But it has been the case that we have looked at alternative scenarios that have looked at broader trade war type of effects, and they can be more significant. One important thing is, I think, how much it might spill over to the financial system and cause some amplification there.

MR. KASHKARI. Or you could just imagine if it doubled in size—if it was 100 percent of imports instead of 50 percent of imports. Unless there's some denominator effect, it still seems like it would be pretty small.

MS. WILSON. Right. Even if you take all of the effects announced so far, so if you even include the steel and the others, it's about—what is it?—about 13 percent of our total imports. So it's still a fairly small share of what is a fairly small share of the economy.

MR. KAMIN. Our imports are like less than 20 percent of GDP, and then we're talking about, so far, 13 percent of those imports. So we're talking about roughly 10 percent of 20 percent, and then we're applying a tariff that averages about 15 percent.

So by the time you multiply all the fractions together, you're getting a relatively small amount. You'll double the effect on our economy if you then assume the increases in tariffs that have been proposed, which is an increase of 15 percentage points on tariffs on a lot of Chinese imports that already have received extra tariffs, and then you add to that the remainder of imports from China that have not yet been hit.

MR. KASHKARI. Thank you.

CHAIRMAN POWELL. President Barkin.

MR. BARKIN. Eric, just a question. I really appreciate those simulated outcomes in those scenarios. I have to say, I'm struck by the seeming lack of inflationary pressure coming out of the difference between the two scenarios, and I'd just be curious, is that something that happens in the out years that you don't see, or is it something about the model, or in fact is there not that much inflationary pressure?

MR. ENGEN. That is a feature of the model. The FRB/US model has a flat Phillips curve, as most macromodels do these days. So that's the key feature that drives the smaller inflation response than the real activity response.

MR. EVANS. Could I ask a clarifying question?

CHAIRMAN POWELL. President Evans.

MR. EVANS. Just on that point, you were talking about page 3—on the SEP, the core inflation path in the SEP—is that where you were talking about? Because it's upward-sloping, and it's still not at 2.5 percent, and if you extend that a few years, does it keep going up or does it level off?

MR. ENGEN. No, it would level off. And eventually, in the out years, it would come back to 2 percent.

MR. EVANS. Does it get to 2½? Do you remember?

MR. ENGEN. I don't know where it gets beyond 2024 there.

MR. EVANS. I mean, it just looks like it's still going up at this point—off and it kind of—

MR. ENGEN. Yes.

MR. EVANS. Okay, thanks.

CHAIRMAN POWELL. Governor Quarles.

MR. QUARLES. Beth Anne, your slide 10—I thought that was really interesting, and as I look at this, maybe this is obvious, but I just wanted to make sure I understood. This is an estimate of just the effect of U.S. interest rates on the exchange rate—the incremental effect of U.S. interest rate changes on exchange rates and real interest rates in foreign economies as opposed to a projection of what we think the actual changes would be, on the basis of developments in those countries?

MS. WILSON. Not quite. Close.

MR. QUARLES. Okay. Oh, good. Then I'm glad I asked the question.

MS. WILSON. What we did was, we created a model with four different country groupings. The United States, the advanced foreign economies. All good?

MR. QUARLES. Yes.

MS. WILSON. Which we normally do. And then we did the emerging market economies, but we split them between ones that are particularly vulnerable and ones that are not. And we said, "Let's assume that no one would be surprised if the market's expectation of our policy rate were realized. And let's shock this model by assuming the staff forecast for the policy rate instead, so that we could get at the question: If the staff baseline forecast were realized, what would that do?"

And so we calibrated. But the key difference between what the market expects, what the Blue Chip consensus expects, and our forecast actually relates to aggregate demand and not to the interest rate.

So what we do is, we try to match the path that we have in the Tealbook regarding the unemployment rate, which is much lower, and it's a similar exercise to what we've seen in other permutations by adding some aggregate demand shocks. Those feed through the model as higher interest rates as well, and then we look at the whole kit-and-caboodle effect on advanced foreign economies, vulnerable emerging markets, and less vulnerable emerging markets. We allow some realism in the sense of vulnerable emerging markets. They are a factor that many people are talking about, which is if you raise the interest rates, will you actually hurt these economies because a lot of their assets will move to the United States, a lot of their assets are dollar-denominated?

MR. QUARLES. So you do take some of that into account.

MS. WILSON. That's taken into account. And so what's nice about this model is, it helps balance things out. One of the issues that's hard to square is that, at the same time we've got stronger aggregate demand in the United States, which should be good for these economies, and some depreciation of that currency should also boost net exports, we have these balance sheet effects for the most vulnerable economies and the inflation expectations effects that we've seen in a number of these countries. And so that's what this model can capture. It captures not just the interest rate effect, but also the aggregate demand implications.

MR. QUARLES. Super. Thank you.

CHAIRMAN POWELL. President Bullard.

MR. BULLARD. Thank you, Mr. Chairman. I have two questions for Eric. One is on the forecast summary, page one, the real GDP picture. And I'm trying to relate that to the Survey of Primary Dealers, exhibit 1, panel 6, which was presented by Simon: "Average Cumulative Probability of U.S. First Entering a Recession, by Year."

According to this, the primary dealers seem to think that there's an 80 percent probability of entering recession by 2022, if I'm reading this correctly. One of the mantras around here has been "expansions don't die of old age," but Wall Street seems to think expansion do, indeed, die of old age.

I'm looking at the real GDP picture with the shaded region here, and it has a negative component. The probability spreads out below zero. This is only a 70 percent confidence interval. You could put a 90 percent confidence interval. Would there be enough probability down there under zero to get this primary dealer picture here?

MR. ENGEN. To get that high?

MR. POTTER. Technically, this a piecewise confidence interval, and you're asking a different question. We didn't ask them for their uncertainty bounds. We asked them for the probability of being in a recession at certain dates. That's basically like the birthday problem—that eventually that probability of recession will go to one, and you can't read that using these kinds of confidence intervals. You'd have to look at the simulated paths.

MR. BULLARD. In your judgment, taking into account this kind of confidence bound, if I simulated that a bunch of times, would I get a lot of recessions over the next five years?

MR. ENGEN. Yes, I can give the results. The confidence bands around the GDP projection are obtained from stochastic simulations using the FRB/US model. Okay? If we did use those around our baseline, the probability of a recession in 2021, I have that as—would be 23 percent.

MR. BULLARD. In that particular year, that's not a cumulative.

MR. POTTER. So that's not—it's marginal.

MR. ENGEN. No, it's not a cumulative, it would be—under that, you know, what's the probability of it occurring in that year?

MR. POTTER. So 25 percent is what we got back from the dealers. It looks like you're reasonably well calibrated.

MR. ENGEN. Yes, that would be—

MR. POTTER. It just builds.

MR. ENGEN. Yes—not accumulating it. I think doing the accumulation would be 7 plus 17 plus 23—would be something a little more comparable to that. So, 40-something, almost 50 percent. The cumulative probability by that time.

MR. BULLARD. To me, this is—and I noticed this in the Tealbook, too—a subtle difference from what we usually say on this topic, which is, "Expansions don't die of old age," which means it's kind of like a coin flip. And if you're not in recession in a particular year, there is no particularly higher probability that you'd be in recession the next year, whereas this is saying, because we expect a slowdown in the economy but the size of the shocks remains the same, the probability of recession is going to go up over the forecast.

MR. ENGEN. Well, indeed, we recognize that risk in our "Risks and Uncertainty" section. When we're discussing the balance of risks there, we point out actually that feature, that we think probably the risks are higher further out in our medium term because the economy in our projection needs to slow down a considerable amount in order to start to move toward sustainable levels, and soft landings historically are hard to engineer, that we probably are in a risk of having a particular negative shock that, say, might not put us into a recession now, but in a slower growth time when the unemployment rate is already starting to creep up, it could be enough to start the recession dynamic. And it's certainly the case that once you start to go into a recession, those probabilities increase much more asymmetrically as the dynamics shift.

MR. POTTER. And I'll add one thing. Market participants have really focused on fiscal policy and what happens from 2020 onward, and they are just factoring that in, and they view that as potentially a drag at this time. And, you know, people can have different views about what fiscal policy is going to do there. But the reason I showed that is, according to many market participants—

MR. BULLARD. No. I know.

MR. POTTER. —who think that the combination of the Fed's trying to slow the economy down and the change of fiscal policy will produce a recession.

MR. BULLARD. Okay. My other question is about federal funds rate projections and the simulation that you did here. This is the forecast summary, I guess, panel 11, the federal funds rate projection. And the staff has had high policy rate projections compared with the Committee here. But I wanted to stress something else, which is, if you look in the Tealbook under the comparisons to the Blue Chip, the Blue Chip will have a top 10 forecast and a bottom 10 forecast for unemployment, for inflation, for GDP growth.

The staff forecasts are in the middle of all those except when it comes to interest rates, and the staff has above even the high 10 percent or high top 10 of the Blue Chip forecast. That makes me worry about the model, and you're getting at that with some of these simulations. But I have worried that we're the outlier and the rest of the forecasting community is doing something else, and I—

MR. ENGEN. Yes. No, we—

MR. BULLARD. —more about what that—why do we think we—

MR. ENGEN. We have long recognized that, yes, the same tension that we have in our projections with the SEP is also there with the Blue Chip. The same difficulties are there explaining all of those.

I mean, I can explain our forecast. I know how it all fits together. I know what our assumptions are about fiscal policy and how much that's going to give a boost to the economy, what the implied effects of monetary policy are, and those things, and it's hard, particularly when it is a consensus or a median forecast, to have a clear picture of exactly what all the underlying forces are there. But, yes, that tension is in both the SEP median and the Blue Chip.

MR. BULLARD. In your judgment, would you say that they're getting a forecast, but then they're judgmentally adjusting rates down from what they would otherwise get from a model? Because you're kind of saying I can't do that in the model, because—

MR. ENGEN. That could be—

MR. BULLARD. —the model would—

MR. ENGEN. Yes. That could be—

MR. BULLARD. —claim that there was higher GDP growth.

MR. ENGEN. That is a possibility. Particularly if you were a Blue Chip forecaster, you would certainly look at what monetary policymakers are saying is the most likely path, and then, okay, tend to write that down. So that is a possibility, but it's not on the radar.

MR. POTTER. On our surveys, their forecasts look fairly similar to the FOMC's forecasts, and they give a pretty similar rate forecast under the modal outlook.

MR. BULLARD. But they don't come back then and say, "Well, you're going to get higher growth than you think," or "You're going to get lower unemployment than you think," which is what your graphs say here.

MR. ENGEN. Yes. At least under our model and framework of thinking about the economy, yes, that's what we get.

MS. WILSON. And one difference, when you look at the unemployment rate forecast in the Blue Chip versus ours and the GDP, as well as the inflation dynamics, is that tacitly they need to be assuming much higher productivity growth than we have. So I think you need—one way of squaring would have to be on the productivity side, and much stronger productivity implied by the Blue Chip.

MR. BULLARD. You can probably ask them about their productivity forecast. I'm not sure that they are particularly high.

CHAIRMAN POWELL. Other questions? [No response] If not, we're going to go to our opportunity to comment on financial stability, beginning with President Rosengren.

MR. ROSENGREN. Thank you, Mr. Chair. I have two financial-stability comments. First is that while there seems to be good progress in getting the Secured Overnight Financing Rate, or SOFR, to begin replacing LIBOR, it is notable that different countries are choosing different structures for their reference rate.

The Swiss have chosen a secured rate like the United States, but the United Kingdom, Japan, and the euro area have chosen unsecured rates. While transitioning from LIBOR to another unsecured rate probably has some advantages, it has potentially undesirable properties. For example, during an episode of financial stress, the unsecured reference rate is likely to go up, while the secured reference rates will go down. Thus, writing floating-rate contracts based on a secured reference rate might be preferable, as it provides a kind of automatic buffer in the event of problems, by avoiding idiosyncratic changes in risk premiums associated with unsecured rates.

In addition, a persistent financial-stability problem might spur movement of contracts to secured-rate countries, like the United States and Switzerland, as during times of financial stress market participants may especially prefer financial contracting on the secured reference rate. Such movements would reinforce the usual safe-haven flows into dollar-denominated instruments and into U.S. markets, magnifying the cross-country flows during actual or potential financial crises. While there may be good reasons for cross-country divergence and reference rates, it may be worth considering whether this could become a problem in a future crisis.

My second observation is that the cap rate on multifamily real estate is currently 5.36 percent, according to Real Capital Analytics. The Tealbook has the 10-year Treasury rate rising to 4¼ percent over the forecast horizon, which would produce an increasingly narrow spread relative to multifamily real estate cap rates. If one assumes the Tealbook baseline is reasonable, there's a significant chance that the multifamily cap rate will rise with the rising Treasury rate. Of course, the main way that the cap rate would adjust to a rising-rate environment would be through falling commercial real estate prices. Because commercial real estate as an asset class is so widely held by banks as well as nonbanks, falling prices would pose a significant financial stability risk. The risk has been heightened recently as many of the large regional banks have significantly increased their commercial real estate exposure.

While the stress test includes significant declines in commercial real estate prices in the severely adverse scenario, they may not fully capture what might happen if many non-SIFI banks fail nearly simultaneously. This is one of many ways in which current high asset valuation pressures that are noted in the QS Assessment could alter our view of whether the financial sector would be well positioned to provide credit in a downturn that features large commercial real estate price declines.

If we were to act now to build up a positive countercyclical capital buffer, we would have the option to reduce the buffer during the downturn in order to sustain lending, mitigating some of the pro-cyclical contribution emanating from the lending cycle. Thank you, Mr. Chair.

CHAIRMAN POWELL. Thank you. Vice Chair Williams.

VICE CHAIRMAN WILLIAMS. Thank you, Mr. Chair. I just have a couple of very brief comments. First of all, I thought that exhibit 1 in the presentation on financial stability was excellent, as was the QS report on leverage and the section on leverage in the private nonfinancial sector. This is a topic that we are definitely hearing a lot about from financial market participants—concerns about not only the buildup of debt, but perhaps excessively optimistic ratings of firms, issues regarding covenant-lite, and all of the other things that you mentioned in your presentation. I think these are really important issues.

My two comments are really on this. One is in the QS report, because it goes through this, but then it aggregates it up into the private nonfinancial sector. That blurs this issue a bit, because when you put it together with households, yes, everything looks hunky-dory. In fact, we're seeing a lot of signs of risk-taking and potential risks in this sector. So I think it's important for all of us not to aggregate it up, but to look at the disaggregated analysis and data. That's my first point.

My second point is, I don't really think of this as a financial stability risk per se, but more of a risk to the economic outlook or one of the risk scenarios. And, in fact, in the Tealbook, in your comments, I think you highlighted that. I'll come back to this when we do the economic go-round, but I think this is one of those good examples in which the information we learned from the supervisory side, from the QS analysis, can actually maybe tell us something not about financial stability risks as much as risks to the economic outlook and how to best fold that into our analysis, whether it's in alternative scenarios or at least in our discussion regarding that. And I just want to highlight that sometimes things aren't a financial stability risk so much as they are one of the ways that that soft landing does not go as well as planned. Thank you.

CHAIRMAN POWELL. Thank you. President Barkin.

MR. BARKIN. I appreciate and I think I agree with this assessment of risks. Like Vice Chairman Williams, I will say that continued expansion in leveraged lending is notable. And to the extent that it's led by segments of the financial system for which we have less visibility, like loan mutual funds or hedge funds or even private equity, this could be a concern, and your presentation clearly is pointing that out to us. I know in 2013 the staff provided a memo on some of these risks, and I wonder if we shouldn't do an update. Something that could improve our sense of visibility with respect to those parts of the market and what the full consequences would be of a potential reversal would be helpful.

And then I just wanted to applaud the note on clearing system resilience. And we should definitely push for whatever authority we need to do this macroprudential stress test that you outline there and potentially in other similar segments.

CHAIRMAN POWELL. Thanks. President Mester.

MS. MESTER. Thank you, Mr. Chair. I also want to thank the staff for their work on assessing the financial stability risks. I found the QS report very informative. And I'm also very supportive of the Board releasing a version of the financial stability report to the public. I think that'll be a useful addition to our communications.

The QS report staff assessment is that vulnerabilities of the financial system remain moderate. And I guess I'm echoing comments by Vice Chairman Williams and President Barkin when I say that I see increasing risks with respect to leveraged lending and business credit that concern me. I also agree with Vice Chairman Williams that they are obscure because of the way the report kind of aggregates household credit and credit to the nonfinancial business sector, and I was wondering whether in the future you could actually disaggregate them on that chart in the beginning that shows the colors. It seems like that would be easy to do. It would add a line, but it might be very helpful.

The leveraged lending has continued to grow. The outstandings are over $1 trillion. They've moved further above the value of high-yield bond markets. Underwriting standards have deteriorated once again.

The QS report, I think, did a very good job. And, Bill, your presentation showed that one-third of newly issued large corporate loans have higher debt-to-EBITDA ratios than in 2007 and 2014 when underwriting standards were very poor. And according to S&P Global, nearly 60 percent of outstanding leveraged loans are to borrowers rated B+ or lower. Covenant-lite loans are a very high percentage of all loans issued, at 80 percent. The quality of loan covenants has deteriorated to its lowest level in the post-crisis period, and the recovery rates will be lower if the loans get into distress.

And there's just been a notable change in the type of firms borrowing. Now it's the firms having lower earnings compared with firms of higher earnings for most of the post-crisis period. This shift to me is an eerie reminder of what we saw in the residential real estate markets before the housing crash.

If you'll remember, at first the no-doc and more exotic mortgage loans were going to the high-income individuals. But over time there was a shift, and these loans were going to the least creditworthy borrowers. And then the Senior Loan Officers Survey also notes some banks are easing their credit standards on C&I loans, citing increased competition coming from other banks and nonbank lenders, and this has been occurring over the past several surveys.

If you think of a lobster in a pot when you turn up the heat, it's easy to get complacent about these things, because from report to report, the risks don't necessarily change much. But these risks have all been moving in the same direction—which is odd. And I think we need to do something to ensure that the risks don't rise to a level at which they amplify a negative economic shock or lead to a downturn.

I found Vice Chairman Williams's comments interesting, because it just shows how there is a blurring between what's considered a financial stability risk and a macroeconomic risk. Financial stability risks materialize and then, as they get exacerbated, feed into a macroeconomic risk. And I think that's one of the things that the Committee is going to have to, at some point, confront.

And, finally, I really appreciate the QS report pointing out that Bank of New York Mellon is now the only provider of triparty repo clearing service, now that JP Morgan has phased out of service. And I think this is an important market. It's now vulnerable to a single point of failure, and I hope that we are actively working to reduce the risk and be prepared in case problems arise. Thank you.

CHAIRMAN POWELL. Thank you. Governor Clarida.

MR. CLARIDA. Thank you very much. This is my first opportunity to provide some remarks on the QS report, and I want to commend the staff for their incredible work on this. Very informative.

I'll try to be brief. In broad terms, I share the staff's assessment of vulnerabilities associated with valuation pressures, business borrowing, and financial leverage. They document all of that well. I would point out in particular that when financial leverage is low, and, importantly, as we're all aware, there've been important changes in them, particularly in the banking system across a wide range of areas, including assets and funding and the like, and that's all positive.

I think the one thing that I'm reminded of is the saying that "Generals fight the last war, sometimes to their detriment," and so I think what's happening in banking is very good, but sometimes what happens is, these problems that may have been in banking migrate elsewhere. I think, particularly in the United States, that's an issue for the System, because unlike continental Europe, a lot more intermediation happens here outside banking. So I think it is important to look across sectors regardless of where the intermediation is occurring. And I think the one area that I'm struggling with and that a lot of folks are in this world today—not just in the United States and not just here—is, there's a distinction between a valuation access and a systemic problem, and we can have sectors that are very overvalued that may not be systemic. It's probably hard to think of a systemic risk that's not overvalued, but, at some level, we're going to need to start thinking about the systemic part as well as identifying where the valuation pressures are. But no one has a good answer to that; I certainly don't. But I think efforts in this direction are very, very worthwhile. Thank you.

CHAIRMAN POWELL. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Mr. Chairman. I'm going to echo Vice Chairman Williams and Presidents Barkin and Mester and, I guess, pile on a little bit.

I thought that the QS report was excellent, but I am increasingly concerned about the buildup of corporate debt for several reasons. And, I guess, like Vice Chairman Williams, it may not present a financial stability problem as much as it has the potential to amplify a slowdown.

And while spreads on debt did not gap out during this recent selloff, I'm not comforted by that at all, because it is my view that we are headed for a gap-out—and it's not a matter of if, but when.

We're used to an environment in which companies have ample access to capital and can roll over debt even if they're struggling. I think that period is going to end here. And I guess a lot of my concern is combined with where I think we are in the business cycle. I guess we'll know in hindsight where we are in the business cycle, but when you combine this situation and all the issues that have been mentioned with what I think will be likely slowing global real growth, certainly, there's no question expected profit growth from '18 to '19 is going to slow substantially. In other words, cash flow and profits are expected among S&P 500 companies to slow substantially from what they've been. We know the fiscal stimulus is fading. We know the delayed response to monetary policy tightening is going to take a grip, and the tariffs obviously don't help any of this. And what I'm worried about is when you do start to see credit spreads begin to widen out, which I think we will at some point, particularly if we begin to slow sometime in '19. We've been on the positive side of the credit cycle here for at least the past couple of years: In other words, it's been a tailwind. I think we're going to see the flipside of the credit cycle, in which you start to have lack of access to capital, potentially a credit crunch, a chilling effect, and a tightening of financial conditions, which might make a moderate slowdown into something worse and, at a minimum, creates a psychological effect when you start reading in the newspaper that companies are actually defaulting and they can't refinance, and you've got a series of workouts.

I think that's going to have the effect of tightening conditions even further. I note the previous time spreads capped out. It was interesting in '15 and '16, and you remember there was a worry then. Of course, you had the energy issue, but there was a worry we were at the end of the cycle. We've since sort of gotten a second wind, but I think we're going to be back to that.

So I applaud your efforts to be vigilant on this, and I think we're going to have to be continually vigilant on this, because I think this sets up as a real vulnerability. It concerns me much more at this stage than stock market overvaluation. I'm far more concerned about this and the effect this is going to have on the outlook. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thanks. Governor Quarles.

MR. QUARLES. Thank you, Mr. Chairman. I share the general outlook on financial stability, that vulnerabilities currently are moderate for all the reasons that the staff gave. So let me just give a few thoughts with respect to the current situation on leverage lending, as that's been the subject of most of the discussion.

Obviously, as Bill Bassett reported in his presentation, there's been a general deterioration in underwriting standards that accelerated over the course of the past year. In particular, covenant-lite deals are the norm. EBITDA add-backs are increasingly common. Now, not every EBITDA add-back is a problem. Some of them are perfectly logical and even necessary, but there's a lot of opportunity for mischief in that. And, despite the EBITDA add-backs , the debt-to-EBITDA ratios are rising. So those developments are likely to cause investors some pain.

But I tend to agree with Vice Chairman Williams that that pain is really more of a question about the outlook as opposed to financial stability, or, I guess I should say, the fact that an investor suffers pain is, for an analyst of financial stability, not necessarily a problem, right? In fact, the possibility that an investor could lose money as a result of a bad decision—the prospect of those losses—forces investors to do their homework and to allocate credit to its best use.

So, rather, the concern is whether there are microprudential safety and soundness issues or a risk of instability in the financial system as a result of these developments. To evaluate that possibility, you need to look at the links between the leveraged lending market and the largest banks and the degree to which unstable funding structures may be fueling these increases in leveraged lending.

With regard to the links to the largest banks, we review the underwriting standards of the largest banks through our review of the Shared National Credit Program. This year we see a deterioration in underwriting standards, consistent with the summary of marketwide conditions in the staff's report, and those developments are notable. Until this year, banks were holding the line on these underwriting standards better than nonbanks. Whether the change is a result of the general perception in the market of all the noise surrounding our guidance on leveraged lending, it's hard to say.

At the same time, the risk-management level at the largest banks is much improved. Much of the public focus on the effects of the 2013 guidance on leveraged lending has been on the bright-line threshold that was perceived for deals with debt-to-EBITDA ratios above 6. But the guidance primarily focused on good risk-management practices. And risk management in this area of leveraged lending—again, at the largest banks in the banking system—is generally quite a bit better than it was a decade ago.

Pipeline risk, by which I mean the risk that a bank could get stuck with one of these loans on its balance sheet, is quantitatively much lower than it was in 2007. So although the shifts in underwriting and the other changes that we've been talking about merit supervisory attention from a microprudential perspective, the microprudential risk is likely pretty low, because these loans are being sold off the bank's books and into long-term holding structures.

So that, then, leads to the second leg of the analysis. What is the macroprudential risk of these structures? Now, the funding structures under which they're sold are principally CLOs, as you all know. The volume of CLOs has increased strongly, but, traditionally, CLOs are funded with stable capital. Both the equity and the debt tranches are committed for a longer duration than that of the underlying loans. This should, in fact, be a risk-mitigating rather than a risk-amplifying practice.

So, even as the volume of loans is growing, if they are being sold in larger numbers—which they are—off the balance sheets of the banks and into more stable long-term holding structures, that should be an okay thing. Indeed, a lot of people may lose money in that process, if the quality of the loans that are being held in these structures is, in fact, deteriorating. But that is more of an outlook question, as opposed to a financial-stability question, unless the terms of those structures are changing.

As the volume of CLOs has been increasing, given that the volume of leveraged loans has been increasing, are the same drivers of reduced standards in the underwriting of the loans, also leading to an evolution of a weakening in the structure of the entities into which they are ultimately being sold? And, there, the staff presentation indicated that we're not seeing a lot of evidence that that is happening. But there are some gaps in our knowledge, and there is an increase in the amount of these that are being held in mutual funds. Those are less stable structures. I mean, it didn't look like, again, a dramatic "earth getting hit by an asteroid" increase, but a material increase that we should keep an eye on.

We should continue to focus on ensuring that we understand how these CLOs and other long-term holding structures may be evolving, but, with respect to leveraged lending, the way I look at it—and, again, just to sum up—is, there are microprudential questions that we're taking steps to address in our supervisory function, but because of the risk-management practices of the banks, it seems that the microprudential risks associated with this decrease in the underwriting standards of leveraged loans is likely to be less of a concern.

We need to ensure that we have a good handle on our understanding of funding structures and risk to market liquidity, but it's not as though we have no handle on that. The information that we have, which is reasonably deep, is that those structures continue to be created in such a way that they are stable. And, relatedly, there are benefits to coordinating with other agencies, such as the SEC, that may have relevant information and a role in setting policies to mitigate liquidity risks.

Then, just circling back—the final comment I'd make: In our existing framework as to whether we would turn on the CCyB in response to concerns in the leveraged lending market, those concerns may be there, but our CCyB framework is a financial-stability one as opposed to a business-cycle one.

And that may or may not be right. I mean, it may be that, as we gain experience in the world and experience with the CCyB, we may want to think about whether we should have a different framework for the CCyB. But as long as it's a financial stability framework, I think our current situation would imply that the leveraged-lending issues don't really argue for turning on the CCyB because they don't appear to be creating increased financial stability risk as opposed to, potentially, business-cycle risk. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. Governor Brainard.

MS. BRAINARD. As President Mester noted earlier, the Board is planning to take another step on the maturity of our financial-stability work by publishing a financial stability report for the first time. The public financial stability report will build on the analytical framework that you're familiar with because of the quarterly surveillance, albeit with far less detail, and there will be no discussion of policy. This is another step in the Board's efforts to increase transparency about our work, and, although it will be announced in the next week, the report itself won't be published for some time. I want to thank the staff not only for preparing that financial stability report, but also for the thorough analysis we got exposed to today.

Like many of you, I find that, in my scan of the environment, rising borrowing by risky businesses stands out, especially at this late stage of a very extended cycle. It's a risk that is a common thread in each of the four areas of vulnerability that the staff analyzes.

The ratio of debt to assets for all nonfinancial businesses is at its highest level in 20 years. And whereas previously it had been mostly high-earning firms with relatively low leverage that were taking on additional debt, over the past year, as President Mester noted, firms with higher leverage, higher interest-expense ratios, and lower earnings in cash have increased their debt loads the most.

Net issuance of risky debt, which had slowed to a stall in late 2016, has rebounded again, and that is particularly so for the growth of leveraged loans outstanding, which rose about 12 percent just over the past 12 months and now exceeds $1 trillion overall. The credit quality of those leveraged loans appears to have deteriorated further over the past six months. The share of newly-issued large loans by corporations with high debt-to-EBITDA ratios, those above 6, trended up to roughly one-third last quarter, which is above the previously high levels observed in 2007 and 2014.

So far, the credit performance of those loans has been strong, with the default rate on leveraged loans at the low end of the historical range. But while corporate credit conditions have been generally favorable, with low interest expenses and low expected default rates, when the cycle turns, we could see elevated levels of defaults among business borrowers and losses to investors.

Of course, this concern is heightened by the elevated level of valuations, and this comes to the point about how these risks might compound. Yields on corporate bonds and leveraged loans relative to rates on Treasury securities are at or near historical lows. This leaves investors exposed should risk premiums move higher.

Spreads on newly-issued leveraged loans moved up over the past few months but remain at the low end of their range. These low spreads are particularly notable, in light of the evidence cited earlier that lenders have become more willing to extend loans with fewer credit protections. We saw that in the SLOOS, and Moody's also shows that existing loan covenants reached their worst recorded level in the first quarter of 2018—the most recent data available.

Similarly, corporate bond spreads are also near the low end of their historical range. Although the credit quality in high-yield corporate bonds has been roughly stable, with the share of high-yield bonds outstanding that are rated "deep junk" staying flat below the financial crisis peak in 2008, the share of bonds rated at the lowest investment-grade level, triple-Bs, has reached near-record levels, at around 35 percent.

In a downturn, widespread downgrades of these bonds to speculative-grade ratings could force some investors to sell because lower-rated bonds have higher regulatory capital requirements or because bond funds have limits on the share of non-investment-grade bonds they can hold. Furthermore, the associated mark-to-market losses could trigger outflows at open-ended bond mutual funds. Overall, assets under management in those bond mutual funds have more than doubled in the past decade. These funds now hold about 15 percent of the corporate bond market.

Mutual funds also hold a large amount of leveraged loans, and this exposure, too, has risen. If prices were to move sharply lower, a rush to redeem shares by open-ended mutual fund investors could lead to large sales of relatively illiquid holdings, further exacerbating price declines and run incentives, and this is the connection to the liquidity and maturity transformation analysis that the staff has done.

Over the next few years, a variety of forces could trigger these kinds of chain reactions—perhaps most simply, as was stated earlier by Vice Chairman Williams, a loss of cyclical momentum along with fiscal retrenchment. Or escalating trade tensions could lead to a broad-based decline in investor risk appetite. Or a sharp increase in concerns about the potential for high inflation or uncertainty about the path of monetary policy could boost term premiums. Any of these shocks could easily start to trigger these kinds of knock-on effects. In addition to generating losses for the holders of these assets, a significant fall in asset prices would make it more costly for firms to obtain or extend financing, especially among risky indebted firms.

Compared with before the financial crisis, the banking sector has much more high-quality capital to absorb potential credit losses, and regulatory reforms have reduced the vulnerabilities of these institutions associated with liquidity and maturity transformation. Even so, a strong case can be made that the capital buffers of banks should be fortified when the economy is strong. Having a thick capital buffer as cyclical pressures build means that banks have a cushion to absorb losses and remain sound. That also helps bolster the confidence of market participants when conditions deteriorate, thereby helping prevent the downward spirals that a loss of confidence can create.

Recent history suggests that the business cycle and the financial cycle are increasingly intertwined. If recent history is any guide, it's a good bet that as this expansion continues, financial imbalances are likely to grow still further. And if banks are to retain their resilience as risks mount, they may need to have fortified ratios of capital to assets. Given where we are in the cycle, these basic principles suggest that now is the time for banks to be fortifying their capital buffers. This doesn't appear to be happening. As can be seen in the quarterly surveillance report, the amount of regulatory capital, whether measured against risk-weighted assets or total assets, has flatlined in recent years overall. And, for our largest institutions, the ratio of common equity to risk-weighted assets has actually moved down over the past two years.

Because it is important that banks build resilience as cyclical risks mount, it may be appropriate for the Board to activate the countercyclical capital buffer at some point to safeguard resilience against stress. Using cyclically-varying macroprudential tools, such as the countercyclical buffer, to address emerging financial risks allows monetary policy to do its job by focusing on its near-term dual-mandate goals without needing to be diverted to address risks of building financial imbalances.

In the months ahead, as we move deeper into a very extended expansion cycle, I'll be attentive, as many of you appear to be as well, to the vulnerabilities associated with very elevated debt among risky businesses and the risks of a sharp correction in valuations and their possible knock-on effects. Thank you, Mr. Chair.

CHAIRMAN POWELL. Thank you. And let me say thanks to the staff and thanks to Governor Brainard for her leadership on getting the financial stability report done. This is a great additional element of transparency about our regulatory framework, and I applaud it. I would say the same thing about the supervision report that we're putting out as well. So it's all good.

And with that, we'll begin the economic go-round, and we'll go until we drop. [Laughter] We'll go as far down this list as we can, and we'll begin with Governor Clarida.

MR. CLARIDA. Thank you, Mr. Chair. I'm going to begin with some comments on recent data and then offer my thoughts on the outlook, and in particular talk about the balance of risks to that outlook. Since the previous meeting, we've had a lot of data. Smoothing across the first three quarters of the year, one finds that real GDP growth in 2018 is averaging 3.3 percent and is likely for the full year to equal, or perhaps slightly exceed, 3 percent.

Indeed, if you look at the data on the business sector, they're even stronger, with real output growing at an average pace of 3.9 percent through the third quarter. Notably, according to the Bureau of Labor Statistics (BLS), productivity growth in the business sector, output per hour, is averaging 2 percent through the first three quarters of the year, while aggregate hours worked are up by 1.9 percent. Now, of course, these numbers are well above longer-run estimates. The staff estimates that the long-run trend in hours growth is running at about ½ percent and productivity perhaps at 1.4 percent. Obviously, in 2018 we have extra growth in both supply and productivity, but it's important to note that we're operating in an environment now with stable inflation, and so the actual growth in supply this year through hours worked on the employment side and productivity is certainly in line with the robust demand in the economy.

Now, ultimately, of course, once the participation rate and unemployment rate stabilize at some point in the future, this ½ percent speed limit on aggregate hours growth will become binding, but I think how quickly this happens will depend in part on labor force participation.

Here recent trends suggest there may be some more room for participation, especially prime-age participation, to rise. In particular, we see a marked increase in prime-age female participation and some increase in male participation, which are both welcome, but both participation rates are still below levels for the prime-age population relative to where they were in the previous cycle.

Productivity, of course, is much harder to call and to forecast, as we all are aware. We saw some slowdown in business investment in the third quarter. Obviously, there's a lot of noise in that series, and we will await the revisions. But it's important, at least to me, to be attentive to the fact that, with increases in borrowing costs that I'll talk about in a moment, we're already seeing that affecting, potentially, the housing sector. That is another issue to watch closely.

Now, of course, the labor market and the pickup in productivity have a mirror image, and that's in the increase in wages. In the most recent data we saw a 3.1 percent increase in average hourly earnings, which is the highest for this cycle. But thus far, if you line up nominal wage growth with underlying inflation and productivity growth, that's more or less what we'd expect in a healthy labor market.

As I noted in September, in past cycles we've seen a pickup in wages even over and above underlying inflation plus productivity growth, and in those cycles it did not result in an increase in price inflation. Instead, it was met by an increase in labor share and a decline in the profit share. Now, I don't have a crystal ball about how a "hot" labor market will evolve, but, certainly, that split between wages' share and profits' share is important as we think about the economy.

Let me focus a little bit on the inflation data—not so much what we're seeing, but inflation expectations data. You can argue that we're certainly as much in the business of stabilizing inflation expectations as we are actual inflation, and, on this score, I have some cause for concern. I'll point to the Michigan surveys and to market-based measures.

If you look at the Michigan surveys of inflation 5 to 10 years in the future, they're just 0.1 percentage point above the all-time lowest value ever recorded, in December 2016. So if much higher "prints" on the Michigan survey 15 years ago were consistent with price stability, which is what we thought at the time—or at least most of us did—then our current readings, which are lower, are also consistent with stable expected inflation. Similarly, if you look at the New York Fed's estimate of expected CPI inflation obtained from the inflation-indexed securities market—again, you need to adjust for term premiums and liquidity, which they very ably do.

The good news is that CPI inflation in those expectations measures is running at 2 percent. But remember that, historically, PCE inflation lags behind CPI inflation. So you could infer that the market-based measures are actually saying expected inflation is below 2 percent. So in terms of risks to the outlook—and I'll conclude—I actually think they're genuinely two sided with respect to our dual-mandate objectives. The fiscal impulse to aggregate demand in 2019, while positive, will be diminished relative to this year and, under current law, would be projected to turn negative in 2020.

Estimates of global growth are being marked down. While some popular indexes of financial conditions are still in the easy zone, borrowing costs across most sectors of the credit market, mortgages, auto loans, credit card balances, investment-grade corporate bonds, and leveraged loans are up materially this year and are above—in many cases, well above—the levels that prevailed before the time of our first hike.

Now, this reflects some combination of an increase in riskless rates and credit spreads. Importantly, as I think we heard an hour or so ago, the rise in rates is largely a story about real rates. And, in fact, if anything, breakeven inflation measures have ticked down a bit, and it appears to be largely a term premium and not, at least in the past several months, a rise in our rate path. While it's difficult to attribute a rise in the term premium to any single cause, I believe that actual and prospective increases in Treasury debt issuance that will have to be absorbed by financial markets at the same time that our balance sheet is shrinking are at least one factor that will continue to put upward pressure on the term premium.

So, pulling all of this together, I think the economy in 2019 and 2020 may be less at risk of excess-demand-driven inflation and may be slowing more rapidly to trend growth and full employment in the context of price stability than perhaps our baseline projection suggests. And this could occur both as aggregate supply rises faster than in the baseline projection and demand slows more than in the baseline projection.

And I'll conclude with this: If we harken back to the 1980s and '90s when I began my career, it was common then to think of macroeconomic adjustment in an environment of deficit-financed fiscal stimulus as operating, in part, through the bond market and, in particular, the real term premium. Conventional wisdom then was that a tight-money, loose-fiscal mix would push up real bond yields, strengthening the dollar, and this in turn would keep aggregate demand in line with supply without risking a rise in inflation. In essence, it was thought at those times that the bond market and, to some extent, the currency markets did some of the Fed's job for it. This time may be different, but if it turns out not to be, we will need to factor in these forces as we assess future economic scenarios. Thank you, Mr. Chair.

CHAIRMAN POWELL. Thank you. President Daly.

MS. DALY. Thank you, Mr. Chair. As my immediate predecessor, Mark Gould, was quick to point out, my start as president coincided with the stock market decline. [Laughter] But there are a few other things that gave him some pause. But, nonetheless, the economy continues to hum along, with strong job gains, low unemployment, and inflation at target. I expect these good conditions to continue as policy normalization helps slow economic growth to a more sustainable pace and keeps inflation just above 3 percent.

Now, my contacts generally shared this view about the economy's health, but they are also feeling nervous, worried that the expansion has just been too long and will simply die of old age. Perhaps I started the mantra, but I am persuaded by the research of my colleague, Glenn Rudebusch, which shows that expansions do not have an expiration date.

That said, I think the sense of worry among my business contacts bears watching. It adds to their already heightened sense of uncertainty associated with the trade battles and all the different kinds of things going on, including global growth and leveraged rates, and so they are just getting more nervous. And I think these things bear watching, because, ultimately, psychology does feed into behavior, and that behavior could slow the economy more than we have anticipated.

Worries aside, the data do continue to come in strong. Last week's job report was no exception. Firms continue to expand. They are hiring workers at a rapid clip. And, at 3.7 percent, the unemployment rate remains well below my estimate of its long-run sustainable level. Moreover, growth in average hourly earnings, which we watch closely, finally broke that 3 percent mark, which is what I view as being broadly consistent with productivity, trend productivity growth, and inflation at target.

So all this strength raises the possibility that the labor market will overheat and that wages will rise sharply. It is, frankly, hard to find much support for this scenario in the aggregate data, but it is also because we have so little data to look over. You have to go all the way back to the 1960s to observe unemployment rates as low as we have now.

But my staff have looked into this, looking at state-level data. And if you go back to the 1990s and look forward, unemployment rates in states regularly fall below 4 percent. They regularly have very "hot" economies. So they've taken advantage of these episodes and used state panel data to consider the likelihood that a persistently tight labor market in the United States could cause a sudden uptick in nominal wage growth. And when they did this—basically, if you look at it, they are looking at state-level data in order to see if there are nonlinearities in the wage Phillips curve.

Now, interestingly, they found little evidence of such nonlinearities. And this general finding, doing all of the robustness checks, holds whether you use different measures of wages or labor market slack. It holds in metropolitan areas as well as in states. And it holds in models that control for supply shocks or a variety of other omitted variables that typically muddy the waters when we estimate these types of models.

And, most notably—and I felt this was really compelling—they found that even in the few cases for which they could find nonlinearities in the models, the additional boost to inflation was really modest, about 0.1 percentage point even at very low levels of unemployment. Now, this evidence, while at first blush seems surprising, is consistent with information received from contacts, who report that they are responding to a tight labor market today by automating, outsourcing, or even scaling back production instead of raising wages. As one contact put it, "At some point, these other alternatives just pencil out." On the basis of the reports like these that I am hearing from my contacts, as well as on the basis of the research, I expect nominal wages to continue to grow at about the pace we have seen recently, maybe a little bit faster. But I remain attuned to the fact that they could pick up in a nonlinear fashion.

Staying with the labor market, I want to conclude with, as Governor Clarida summarized, a very positive outgrowth of the long expansion, which has been the increase in labor force participation, which rose again in October. So far, these increases have not surprised me. The Great Recession pushed the participation rate so far below my estimate of trend that the partial rebound was just—I expected that it was likely. The question is, is there a lot more room for cyclical gains? Now, if you look through the lens of the models we use in San Francisco, the likely answer is “no.” If we take account of demographics; ongoing reductions in labor force participation rates among high-income households, which continue to happen; and mismatches between worker skills and job demands, labor force participation appears to be back to trend.

But, frankly, this view is hard to square with the fact that, relative to other industrialized nations, U.S. labor force participation rates remain very modest—not only relative to our previous peaks, but relative to other industrialized competitors. So we wanted to know, are we missing something? To answer this question, my colleagues in San Francisco and I looked at the evolution of labor force participation in the United States and Canada. That’s a country with very similar demographic trends and very similar economic conditions. And we found that, between the mid-1970s and the late 1990s, U.S. and Canadian participation rates tracked very closely, steadily rising in both countries. But, since that time, they have drifted far apart. The U.S. participation rate has continued to decline, and the Canadian participation rate has risen further.

So we drilled down and we asked why, and we can attribute three-fourths of the divergence between the two rates to the participation decisions of women. When you look even further down, you can see that the differences are in fact related to family-leave policies, especially parental-leave policies that help women maintain their connection to the labor force even after they have had a child. The remaining one-fourth is attributable to men, and that can be traced back to the fact that the hit to high-school-educated workers in the United States has been much harder than it has been in Canada. So if you're a U.S. worker and you have a high-school education, you are much less likely to be employed than if you are in Canada and have a high-school education.

If you put those two things together, to me this seems to suggest that the divergence in participation rates between the two countries is structural, not cyclical. If we close this gap—and this is compelling—if you could close this gap, we would bring about 6.5 million workers back into the U.S. labor force. But for that to occur, it is likely going to take significant structural changes to our economy and to our policy. So, as a result, I am not really optimistic that further substantial cyclical increases in labor force participation are in our future, although I am open to the idea that a little more uptick in participation is likely. Thank you.

CHAIRMAN POWELL. Thank you. President Rosengren.

MR. ROSENGREN. Thank you, Mr. Chair. October's employment report, released last Friday. was very strong: 150,000 net new jobs were created last month, with 218,000 jobs created on average over the past three months. A "hot" job market is bringing workers into the labor force and creating jobs for those that, in a weaker labor market, would have difficulty finding work. However, with the unemployment rate already at 3.7 percent, it is important to ask how sustainable it is to be creating jobs at more than twice the rate necessary to keep the unemployment rate constant at this low level.

Certainly, one indicator that the tight labor market is starting to be too "hot" would be wages and salaries rising faster than the sum of inflation and productivity growth. Last week, we received several reports that indicate that wage pressures continue to build. The employment cost index showed that wages and salaries for private-sector employees rose 3.1 percent over the past year, the largest increase since 2008. This is 50 basis points higher than wages and salaries for private-sector employees for the year ending in September 2017. At this rate, wage and salary increases are quite close to the sum of inflation and estimated productivity growth. If we continue to see a gradual increase in wages and salaries, like what we have seen over the past year for private-sector wages and salaries, productivity will need to increase, or profit margins will need to diminish, or prices will need to rise.

Similarly, average hourly earnings as reported in last week's employment report also grew 3.1 percent over the past 12 months. While this may overstate the increase because there was a hurricane a year ago, the trend over the past several years has been for average hourly earnings to increase gradually. The current level of nominal wage growth is what one might expect on the basis of inflation and productivity trends. But a continuation of the upward trend in nominal wage growth compared with last year would lead to nominal wage growth in excess of the sum of productivity growth and 2 percent inflation unless we indeed see an increase in productivity growth.

An important question is whether tight labor markets, with a rising trend in wages, will translate into higher prices. My own forecast is for a higher inflation rate than in the Tealbook, which in effect has no significant change over the next three years from where total and core PCE inflation rates are today, even though the output gap continues to expand.

I think there are several risks to that forecast. First, as we push the unemployment rate even further below our estimates of its longer-run rate, it is quite possible that we would get a somewhat larger coefficient on the Phillips curve.

Second, anecdotally, my business contacts have been talking about opportunistic price increases tied to increases in tariffs. Should the Administration impose tariffs on all Chinese imports, then not only importers but also domestic competitors for the imports are likely to raise prices. This has been the pattern my contacts have noted with the steel and aluminum tariffs—in which domestic producers have tended to increase prices rather than significantly increase domestic production.

A third significant difference between the Tealbook forecast and my forecast for inflation is where prices are anchored. I have long-run inflation expectations anchored at 2 percent, not a bit below 2 percent as in the Tealbook. Perhaps consistent with the higher inflation expectations I am using, a number of articles in the press have noted the increasing prevalence of price increases. While many of these articles suggest that price increases have been associated with tariffs, some have noted more general price increases apart from goods that might be directly influenced by tariffs. A good example is the article that appeared on the front page of the *Wall Street Journal* last Thursday with the headline "From Coke to Clorox: Inflation Hits Home." This article highlighted the many household items whose prices are going up and noted that many of these goods were not imported.

While many of the price increases were prospective or had happened recently, news articles highlighting higher wages and prices are one sign that many forecasts may overestimate the extent to which inflation expectations are anchored. The potential for higher inflation is of little concern if it is viewed as transitory. However, the Tealbook, like many private forecasters, has the unemployment rate drifting lower over the next few years, implying a further tightening of labor markets that are already a full percentage point below my estimate of the NAIRU. In view of how long it is likely to take us to reverse the decline in unemployment and ultimately reach the natural rate, if we overshoot our inflation target, it is not clear how easy it will be to bring inflation back to our 2 percent goal.

Should inflation rise more than we are expecting, and this behavior of inflation looks to be a persistent overshoot, financial markets will likely expect more rapid interest rate increases. This might be avoided if we were to change our policy framework, perhaps by adopting an inflation range that is forgiving of a more persistent increase above the center of the range. However, in the absence of such a framework, persistent overshoots of inflation would likely require more and more rapid tightening than is currently embedded in the SEP median forecast. Thank you, Mr. Chair.

CHAIRMAN POWELL. Thank you. Governor Quarles.

MR. QUARLES. Thank you, Mr. Chairman. Notwithstanding the recent volatility in equity markets, which I, like most, am calling the "daily dive," I still view the underlying fundamentals of the United States economy as strong. The labor market is robust. Strong employment gains are supporting confidence and consumption. I am a little disconcerted that investment appears to have slowed significantly in the previous quarter.

Like the staff, I am not inclined to read too much into any one particular data point. Particularly, the investment data do tend to bounce around, and I would expect this to bounce back this coming quarter. That said, I will be looking at the investment data closely.

Capital deepening and the attendant increase in productivity and potential growth have an important role in my outlook, as higher investment boosts the productive capacity of the economy, balancing strong growth with only gradual increases in the policy rate. If investment were to continue to falter, I would grow more concerned about the sustainability of growth as we go forward, in part as it makes it more likely that demand might outstrip supply, leading to imbalances in the economy.

One question that I will be interested in discussing with members of the Committee is how we identify incipient economic imbalances. Or, put differently, how would we know if the economy is overheating? Traditionally, obviously, current inflation is viewed as the primary indicator of an economy that is operating in excess of its potential. But in the current environment of anchored inflation expectations and a flat Phillips curve, I wonder if current inflation is as reliable a gauge as it has been in the past. In particular, I think there is a distinct possibility that the flattening of the Phillips curve and the anchoring of inflation expectations are what economists would call endogenous features of our inflation-targeting policy framework.

Inflation has become an indicator of the public's belief in our competence and commitment rather than a pure gauge of the cyclical state of the economy. So I see a risk that if we just look at inflation as a measure of the economy's position relative to potential, we risk pushing the economy into a place that it doesn't want to go. Anchored inflation expectations might mask the inflation signal that is coming from an overheated economy for a period, but I don't think any of us would have any doubt that prices would eventually move up in response to resource constraints. And the ultimate price of that, from the perspective of the dual mandate, would be an unanchoring of inflation expectations.

I think we should be paying attention to other indicators of tightness and overheating in addition to inflation. Beyond inflation, there are other signs that economic activity is exceeding potential—including, but not limited to, direct measures of labor utilization or indications of shortages and bottlenecks in production.

I also appreciated the staff memo and Beth Anne's discussion on the effects of U.S. policy on emerging markets. As we tighten policy, it is likely that foreign financial conditions will tighten somewhat. Certainly, if history is any guide, faced with a situation of high debt levels in some emerging markets, we would expect tighter conditions to be associated with increased financial stress, particularly in countries with high levels of dollar-denominated debt.

But, while acknowledging that potential for stress, there are a few things to keep in mind. First, our tightening of monetary policy is coming in the context of strong U.S. growth. Increased demand for foreign exports in the United States is likely to offset, to some degree, the drag due to tighter financial conditions.

Second, in meeting our dual mandate, the best we can do for the rest of the world is to conduct our policy in a transparent and consistent and reasonably predictable way. I think we are doing our best to check those boxes. Certainly, holding off on tightening now, only to have to tighten abruptly later, would be far more stressful for emerging markets than our current gradual approach to policy.

And, finally, many emerging markets should be credited for substantially improving their policy and institutional frameworks over those in place in previous FOMC tightening cycles. We're seeing that play out in the differentiation in the reaction of different emerging markets. Many countries are now better positioned to weather tightening financial conditions than in the past.

Finally, a word on the recent increase in tariffs. While the economic effect of the tariffs so far appears to be limited, and I share President Kashkari's puzzlement over that, at least it is being overwhelmed by positive momentum elsewhere in the economy. At some point, it would not be surprising if we started to see prices move up as some part of the tariffs is passed on to consumers.

There is a strong case to be made for monetary policy to simply look through the price effects of tariffs—that is, not to react to tariff-related price increases, as they are more likely to be one-time price hikes rather than to result in a sustained increase in inflation. But, while that is sound on paper, doing so in practice I think could be quite difficult.

In the data, it is going to be very hard to work out the portion of any observed price increase that is due to tariffs relative to other factors, including a general tightness in the economy. And, in addition, we can't dismiss the possibility that, although the higher tariffs may be a one-time event, the hikes engender second-round price increases as domestic firms and workers attempt to make up for their lost purchasing power.

And the simple discovery that raising prices results in the ability to continue to sell your product unanchors what have been deeply anchored inflation expectations up to now, related to my comments earlier in my soliloquy. Thank you, Mr. Chair.

CHAIRMAN POWELL. Thank you. And I think we will draw a line under it there and resume tomorrow morning at 9:00 a.m. In the meantime, as usual, there is a reception and a dinner downstairs in the elegant West Court Café—[laughter]—beginning effectively immediately.

[Meeting recessed]

November 8 Session

CHAIRMAN POWELL. Good morning, everyone. Let's resume our economic go-round with President Bullard.

MR. BULLARD. Thank you, Mr. Chairman. The Eighth District economy continues to grow at a moderate pace but somewhat slower than the nation as a whole. District labor market conditions continue to improve, and the District unemployment rate was 3.7 percent in the most recent data. The improved labor market of recent years continues to pull more people into the labor force.

Business contacts continue to report sharp price increases in the transportation and construction sectors. Price uncertainty as a result of the ongoing trade war is causing jockeying in some markets before year-end, as firms attempt to lock in price contracts before certain tariffs are fully effective.

Chinese tariffs on U.S. soybeans are hitting the Eighth District economy particularly hard. According to the U.S. Department of Agriculture, 2018 soybean production is up 8 percent compared with 2017, but exports to the world are down 50 percent, and exports to China are down 98 percent, or about 8.3 million tons. The stockpile of soybeans will be 15.8 million tons in October, an estimate that is up 50 percent from the estimate made just one month earlier. Suffice it to say that this market has been severely disrupted by the trade war. In general, beyond soybeans, contacts indicate the agribusiness sector has moved from bad to worse in 2018 and is not sharing in the general prosperity of the nation at this time.

Another sector that appears to be struggling is real estate, as a combination of cost increases, higher interest rates, and relatively high prices driven by limited inventory have acted in concert to slow the sector down significantly. It's also somewhat worrying that business fixed investment growth has surprised to the downside during 2018, as Governor Quarles mentioned yesterday.

It's true that the national economy looks poised to achieve 3 percent growth for 2018, but according to most forecasters, this may be the high point, as most of them have the economy slowing back to a relatively low rate of potential growth over the next few years. This raises an important question for this Committee. If the economy is naturally going to slow over the next few years anyway and there's little inflation pressure, what is the purpose of further policy rate increases?

In my view, this Committee has already been notably preemptive in raising the policy rate off zero by 200 basis points and commencing a reduction of the size of the balance sheet during a period in which inflation has consistently run below the Committee's stated inflation target. We have been aided in this effort because the economy has consistently surprised to the upside in 2017 and 2018, but the news won't always be good as we go forward. Inflation pressure seems to be quite low. Inflation expectations, as described on page 22 of the Tealbook, are lower today than they were in 2011 and 2012, a period when U.S. labor markets were in much worse shape than they are today.

TIPS-based expected inflation measures—when translated from CPI inflation to PCE inflation, as Governor Clarida was talking about yesterday—continue to suggest that the Committee will miss its stated inflation target on the low side over the next two years, over the next five years, and over the next five years after that. These market-based expectations take into account all available information and represent a best guess of the likely future inflation outcomes.

In my opinion, we should take more of a signal from these expectations than we currently do. One way to do this is to modernize the inertial Taylor (1999) rule that forms the basis for a lot of the policy discussion around this table. This rule was developed in the late 1990s and based on data from the 1980s and '90s. However, 20 years later, much has changed. I'll discuss this further in the policy go-round. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. Governor Brainard.

MS. BRAINARD. Thank you. Recent data confirm that domestic economic momentum is strong and the pace of resource tightening shows no signs of slowing, while unemployment is at its lowest level in 50 years and inflation is at target. In addition, considerable spending associated with the budget agreement remains in the pipeline. On the other hand, financial conditions have tightened. Interest rate–sensitive sectors show some signs of slowing, and the foreign outlook is clouded. While the intermeeting period has shown glimpses of risks on both sides, recent developments haven't materially changed my baseline outlook, which has real GDP growth remaining above its trend rate into next year.

Employment gains continue to be particularly strong. Payrolls have been increasing roughly 220,000, on average, over the past three months, double the pace necessary to absorb new entrants into the labor force. The unemployment rate remains at 3.7 percent, the lowest level in almost 50 years, and participation continues to show cyclical gains.

There are a variety of signals that I consult in gauging how tight the labor market might be. The employment-to-population ratio among prime-age workers has risen and now is only about ½ percentage point below its previous cyclical peak. And while it's been nearly 50 years since we saw unemployment as low as it is today, the working-age population is much more educated today than it was then, and more-educated employees tend to have lower unemployment rates than those with a high-school degree or less.

There are also unmistakable signs of rising tightness, however. As has been the case for some time, many employers are complaining that they are having difficulty finding qualified workers. At 4.8 percent, the job openings rate is now notably higher than the unemployment rate, and on its face it suggests there are now more job openings than unemployed workers to fill them.

Labor market tightness is leading to faster wage gains, as President Daly described in greater detail yesterday. Both average hourly earnings and the employment cost index increased about 3 percent over the past 12 months, which is a pickup from the past couple of years and, in the case of average hourly earnings, the largest 12-month change we've seen since 2009. These wage gains are good news for the financial health of many households.

Following robust gains in the second and third quarters of this year, the staff projects real GDP will post another above-trend gain in the current quarter, making for an increase of 3 percent over the four quarters of 2018.

Despite the strong third quarter, real business investment growth was surprisingly weak, following several quarters of rapid growth. On balance, there are good reasons to expect that softness to be transitory. Business investment can be quite volatile, and we've seen other times during the current expansion when weak quarterly growth proved to be transitory.

Business sentiment is ebullient, and we likely have not yet seen the full effects of the recent corporate tax cuts. For these reasons, the baseline forecast seems reasonable to me. It has business investment rebounding in the fourth quarter and growing at a robust 4½ percent pace in the first half of next year. Nonetheless, actual and threatened trade measures are creating considerable uncertainty, and the economy is well into one of the longest business cycles in recent memory.

Residential investment has been notably weak, consistent with that sector's interest rate sensitivity. Here, too, I'm watching developments very closely, but residential investment was less of an engine of overall growth in this expansion compared with previous expansions, so we might expect a commensurately smaller overall effect due to its softening.

Financial conditions tightened last month. As of yesterday, from the last time we met in September, the dollar has appreciated about 1½ percent. The 10-year Treasury yield is 12 points higher. Spreads on corporate bonds are wider by 20 basis points for triple-B-rated bonds and almost 50 basis points for high-yield bonds. Equity prices are also down, but that is changing by the minute.

Even with this tightening, various indexes suggest that financial conditions remain relatively accommodative overall when judged against historical norms. As we discussed yesterday, credit spreads on a variety of different instruments—corporate bonds, leveraged loans, and CRE capitalizations—remain at the very low end of their historical range.

Over the past year, it has been a common source of puzzlement around this table that financial conditions overall remained extremely accommodative and didn't appear to be reflecting the path of the policy rate given in the SEP. To some degree, the intermeeting tightening brings overall financial conditions into closer alignment with the baseline path. The staff, in response to this recent tightening, has trimmed slightly their outlook for growth over the medium term. This seems appropriate. For my part, I had already taken some expectation of tightening financial conditions onboard in my SEP outlook over the medium term.

Inflation has now been running at target for several months. Core PCE prices have increased 2 percent. This is also true of overall PCE inflation and the Dallas Fed's trimmed mean. I think we should probably savor this moment—it's quite an accomplishment. And both survey- and market-based indicators of inflation expectations have been stable recently, although, as others have noted, they remain on the soft side. As we go forward, there's some likelihood that continued tightening in resource utilization and an increase in the breadth and size of tariff barriers could show up in some acceleration of inflation. While I'll be watching this closely, I anticipate that well-anchored inflation expectations, along with the Committee's policy rate path, will help inflation remain near target.

There are also risks to the downside. While the substantial spending in the pipeline and the underlying momentum of the economy suggest that domestic growth will remain solid, the global environment is less favorable. Japan and Europe have seen some loss of momentum. The ECB is communicating a determination to end its asset purchase program, which has been an important factor pinning down longer-term rates. And the euro area is managing internal risks associated with Italy's fiscal politics and external risks arising from the looming deadline for its complicated disentanglement from the United Kingdom, as we heard from Beth Anne yesterday.

China has been undertaking a deliberate and significant shift from a policy of deleveraging to ramping up investment and monetary support in the midst of a protracted trade standoff. I would expect us to start to see that gaining some traction. But a China shock could reverberate in emerging markets and beyond, and already the most vulnerable emerging markets are seeing capital outflows and other pressures as the dollar has strengthened and interest rates have risen. Although these pressures are still confined to a vulnerable few, a broadening of stresses is certainly a risk that I'm attentive to.

Importantly, I can't rule out a downside scenario in which the substantial stimulus coming from the budget agreement falls back to the pre–budget agreement trajectory at the same time that domestic momentum and foreign growth slow. That perfect storm would be extremely challenging. But for a variety of reasons, I view the likely scenario to be one in which spending remains on a similar trajectory in real terms through the medium term.

In short, we've seen glimpses of both upside and downside risks over the past month, but data on economic activity, the labor market, and inflation have come in broadly as expected, leaving me comfortable staying the course we set out in September. Thank you, Mr. Chair.

CHAIRMAN POWELL. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Mr. Chairman. Economic conditions of the 11th District continue to be strong. Since our previous FOMC meeting, manufacturing and service sector surveys continue to be strong.

At the start of 2018, we had expected first-half growth, particularly in Texas, to be solid as a result of a rebound from Hurricane Harvey, but we had expected a dissipation in second-half growth. And that's basically what we are seeing. First-half job growth in Texas was 3.1 percent annualized. Third-quarter job growth has slipped down to 2.4 percent, and we expect about 2 percent job growth for the rest of this year. We expect next year's job growth to be approximately 2 percent.

Like most of you, in discussions with contacts we're seeing widespread reports of rising input costs, labor shortages, and wage pressures, particularly in our District for workers making $10 to $15 an hour, as well as for skilled workers. In addition, higher raw material costs—steel, aluminum, and so forth—are posing challenges. Industry contacts report mixed success in passing on these higher costs in the form of higher prices. In particular, consumer-facing companies—including homebuilders, which I'll comment on in a moment—are finding it difficult to pass on cost increases. Exporters also cite the stronger dollar as one of the pressures they are facing in dealing with passing on these costs in the form of higher prices. In our recent business survey results, 44 percent of our respondents say tariffs are causing higher input costs, and 55 percent cite greater uncertainty in their business because of tariffs. Two-thirds of all respondents report difficulty finding and hiring qualified workers, and 48 percent of respondents report a rise in the cost of credit over the past six months versus about 27 percent at the same time last year.

We are seeing weakness in a number of our major metropolitan areas regarding home sales, along the lines President Bullard alluded to. This has been going on for several months. Some of it, as was discussed, appears to be related to a mix of input pressures, higher material costs, labor shortages, and higher mortgage costs. Contacts cite the rule of thumb as being four times a family's annual income should translate to an affordable home purchase. However, consumers appear to be balking at this rule in the Dallas and Houston suburbs. One builder referred to this as "sticker shock" and mentioned that they're going to need to go back and rethink the ideal income for a dollar of home price, and that this formula appears not to be working right now.

I would note that we are not seeing this weakness in other durable goods purchase data, but we're going to continue to watch it closely. I would also note that this new home sales weakness is off a very high sales base and may be evidence of a temporary pause versus a more sustained decline, but time will tell, and we need to watch this carefully.

Regarding the United States, our Dallas Fed economists expect 3 percent real GDP growth for 2018 but expect a slowing to 2¼ to 2½ percent in 2019, trending toward 2 percent in

2020 as fiscal stimulus fades. In this context, though, we still expect cyclical inflation pressures to build, but we think those pressures will be muted by the structural forces of technology-enabled disruption and, to some degree, globalization. We also expect the degree of the overshoot of full employment to continue to grow.

Why might we be too pessimistic in our 2019 and 2020 forecasts? It's possible that a burst in sustainable productivity growth will help offset slowing workforce growth. I'm skeptical whether we will see this, but we hold open that as a possibility. We also are cognizant that the U.S. economy has now expanded for 112 consecutive months, and, by our reckoning, if the expansion continues through July 2019, it will be the longest on record. Whatever your judgment is on this, it's clear to us that we are now late in the economic cycle.

I would also note that the economic expansion at this point is heavily reliant on the strong consumer—maybe too heavily reliant, especially if we don't get greater business and residential fixed investment. I am also cognizant of the fact that growth outside the United States is slowing, and risks, at least to us, appear to be to the downside. Is it just a matter of time before these issues spill over into the U.S. economy? This leads me to a discussion of the recent stock market volatility and what at least I've learned from reading corporate earnings reports recently.

First, it's worth noting that history has shown that later in the economic cycle, particularly as the Committee starts raising rates, P/E multiples tend to contract. This is to be expected, and we've been seeing that through most of 2018, in that corporate earnings have grown substantially, and yet the market is up only modestly or essentially flat.

Second, corporate earnings reports I'm seeing are consistent with what we're hearing from contacts—that is, input costs are rising. In some cases they can be passed on in price increases, and in some cases they lead to margin erosion. Companies are attempting to address this through more cost-cutting efforts, more merger activity, and financial engineering, but this margin erosion and tariff uncertainty I think is limiting business fixed investment, and I'm watching this carefully, but I don't expect this to change.

Estimates of S&P earnings growth for 2019 are approximately $170 a share. They were $160 a share for 2018. So the rate of profit growth from '18 to '19 is going to be much slower than what we experienced with profit growth for the S&P from '17 to '18. Of course, tax reform was a big part of this profit growth burst from '17 to '18, but I'm cognizant also that more than 40 percent of S&P revenues come from outside the United States, and slowing in the growth of the global economy may well create a further headwind for corporate earnings. Again, slowing profit growth will, we think, tend to slow business investment. As we discussed yesterday afternoon, it will negatively affect the credit cycle—which is a nice way of saying that credit spreads are going to widen, which will further tighten financial conditions and may ultimately begin to affect employment trends.

Whether and how these trends affect the underlying economy and, in turn, affect our thinking regarding the pace of removal of accommodation is something that I am thinking carefully about and discussing with my team. More on that in the policy go-round. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thanks. President Harker.

MR. HARKER. Thank you, Mr. Chair. With the exception of the policy rate path, which I believe is overly steep and unlikely to transpire, I am in general agreement with the staff's near-term forecast of economic activity. While housing appears lackluster, as others have observed, most other sectors are exhibiting varying degrees of strength, and economic fundamentals remain on a solid footing. Indeed, activity in the Third District and conversations with various contacts are consistent with the overall picture painted in the Tealbook.

The Third District continues to grow at what I would characterize as a modest pace. The regional labor market continues to tighten, with three-month employment growth of 1.1 percent through September and an unemployment rate that declined to 4.1 percent. As well, employment strength in various sectors mirrors what we are experiencing nationally.

We've also seen a slight uptick in the region's labor force participation rate, and we continue to hear of reduced resistance to raising wages. For example, one contact reported that wage pressures were especially severe for $15 to $25 per hour jobs, and that his firm was raising wages $5 to $10 for each of these types of jobs. This firm is also taking on more unskilled workers and training them.

Another contact indicated that the labor market was particularly tight in the cases of engineers, IT personnel, and tool and die workers. At his firm, apprenticeship programs are taking on added importance. He further indicated that although, on average, wages were rising at around 3.5 percent, there are some categories of jobs in his shop experiencing raises in the 20 percent neighborhood.

Our latest manufacturing survey indicates moderate growth among the District's manufacturers. Capacity utilization is up for the year, and shipments, orders, and employment are all performing strongly. Similarly, moderate activity is also being reported on our nonmanufacturing survey, and both manufacturers and service providers remain quite optimistic. Notably, though, we are seeing some decline in price pressures. Tariffs, however, remain a concern, and tariff surcharges are appearing on invoices. Apart from tariffs, there are no significant price pressures, and contacts indicate that high volumes of production that reduce overhead costs are primarily the reason you're not seeing that pressure right now.

Consumers remain optimistic in our region, and autos continue to move out of the show rooms at very high rates. Again, consistent with what others said, the only other sector that's showing few signs of life is housing, and in our region it's even weaker than what we're seeing nationally. Also, homebuilders are indicating even less optimism for 2019. But overall, we are seeing modest to moderate growth, the growth is fairly broad-based, and our regional activity is entirely consistent with the staff's view of the national economy. Thank you, Mr. Chair.

CHAIRMAN POWELL. Thank you. President Mester.

MS. MESTER. Thank you, Mr. Chair. The Fourth District economy continues to expand, but there are now nascent signs of tariffs affecting both activity and prices. The Cleveland Fed staff's diffusion index measuring the difference in the percentage of business contacts reporting better versus worse conditions was 26 in November, down slightly since our previous FOMC meeting.

Manufacturing, construction, and transportation show signs of moderation. A few contacts attributed moderation to the impending implementation of tariffs having pulled some purchases and shipments forward to earlier in the year. A contact in commercial construction noted that his firm's manufacturing clients were beginning to pull back on their orders. Though moderating, transportation activity remains at high levels, with trucking firms citing the difficulty in getting drivers as a continuing issue.

Overall, contacts remain relatively optimistic, with about 40 percent expecting conditions to improve in the next several months. Contacts perceive increased stock market volatility will likely be transitory and have not adjusted their near-term outlook or business plan.

A large multinational manufacturer of capital goods headquartered in the Fourth District was more concerned about an economic slowdown in China being compounded by tariffs. While the company remains generally optimistic about the U.S. economy, the recent deceleration in its orders linked to conditions in China has shifted the firm to "wait-and-see" mode.

Large banking organizations in the District perceive that economic uncertainty in tariff and trade policy may be constraining more robust capital expenditures, but that firms may also be using internal cash flow rather than bank lending to fund projects. The bankers also indicate that labor shortages, particularly in the area of skilled labor, may be constricting expansion. Indeed, District labor market conditions remain strong, and companies continue to say it's hard to find workers. The District's unemployment rate was 4½ percent in September, near its lowest level since the early 2000s and about ½ percentage point below the Cleveland staff's current estimate of the District's longer-run normal rate of unemployment.

In September, year-over-year growth in payrolls picked up to 1.7 percent, well above the Cleveland staff's estimate of its longer-run trend. Firms across a range of industries continue to report having to pay more to attract and retain workers.

Price pressures in the District remain elevated. The Cleveland bank staff's diffusion indexes of prices paid and of nonlabor input costs are near multiyear highs. More than one-third of the contacts experiencing higher input costs attributed the increase at least partially to tariffs.

For the national economy, my modal outlook is little changed, but I see slightly greater downside risk to growth than at the time of our previous meeting. In light of the elevated valuations in the stock market, the decline in equity prices and increased volatility might have been expected to happen at some point. Nonetheless, the recent moves did get my attention. While a deeper and more persistent drop in equity markets could dash confidence and lead to a significant pullback in risk-taking and spending, we're not at this point. The movements of late do not seem to be signaling that investors are becoming overly pessimistic. Credit spreads have changed relatively little. Overall financial conditions are accommodative and, as I mentioned, firm contacts are not overly concerned. I view the market volatility as a risk to the forecast that bears monitoring, but it has not led me to change my modal medium-run outlook. Incoming data support the forecast of above-trend growth that will be slowing down gradually over the forecast horizon, very strong labor markets, and inflation remaining near target, conditional on appropriate adjustments in monetary policy.

The slowdown in the housing market over the past year is not unexpected and likely reflects the rise in interest rates. The 30-year fixed mortgage rate is about 1 percentage point higher than a year ago. According to a Cleveland Fed staff model, the decline in residential investment this year can be largely explained by the increase in mortgage rates over the past year and declines in consumer sentiment toward home buying. In addition, in some areas a lack of housing supply may also be negatively weighing on housing activity, and the recent changes in the tax law that limit deductions for state and local taxes and mortgage interest could affect the sector.

The recent slowdown in business fixed investment is somewhat more of a puzzle. Anecdotal reports point to several possible factors, including uncertainty over tariffs and trade, conditions in China, and tight labor markets. But it's too early to say if any of these are having a material effect or whether the slowdown will continue. I see slower-than-expected investment spending as a downside risk to the forecast, with implications for both aggregate demand and aggregate supply over the medium run.

Labor markets continue to tighten. Payroll job gains have averaged 210,000 jobs per month this year, up from about 180,000 per month last year and well above most estimates of trend. The unemployment rate at 3.7 percent is at its lowest level since the late 1960s, as Governor Brainard discussed. I found your comments about the fact that there are more college-educated people in the labor force interesting. But a lot of people tell me that a high-school diploma back in the day is the equivalent of a college diploma today, so I guess maybe we need to adjust for educational unit. Anyway, the current unemployment rate is below the SEP median estimate of the longer-run normal rate of 4½ percent, which is also my own estimate.

The labor force participation rate has remained broadly stable despite a declining longer-run trend due to the aging of the population. The prime-age participation rate has moved up this year. While it has not reached its pre-recession level, it is at or above its trend level estimated by Cleveland bank staff economist Bruce Fallick and his colleagues at the Board.

Reflecting the tightness in the labor market's aggregate measures of wages, including the employment cost index, average hourly earnings are accelerating, but I wouldn't expect to see a strong acceleration in wages unless we see a stronger pickup in productivity growth. But then again, this would be welcome, as wage growth reflecting higher productivity growth has not contributed to inflationary pressures in the competitive economy.

Both headline and core PCE inflation continue to run at our longer-run goal of 2 percent. Inflation expectations, obtained from various surveys, in the Cleveland Fed's model are little changed since our previous FOMC meeting. And with the economy strong, long-run inflation expectations well anchored, and appropriate monetary policy, I expect inflation to remain near 2 percent over our forecast horizon.

While my modal forecast is unchanged, I do see slightly greater downside risk to my growth forecast compared with our previous meeting. Although I recognize it might always be easier to see the downside than the upside, an escalation in tariffs could disrupt supply chains and raise uncertainty, thereby restraining real GDP growth. The divergence in growth and in monetary policy between the United States and abroad could lead to a stronger-than-anticipated appreciation of the dollar, which would have consequences for both U.S. growth and inflation. Geopolitical risk, including the effects of the Iranian sanctions on world oil prices, is a risk, and losses in the stock market could worsen and weigh on household and business spending.

On the upside for growth, fiscal policy could have larger-than-anticipated positive effects on both aggregate demand and aggregate supply. And the box on the distribution of household wealth and personal savings in Tealbook A suggests that aggregate consumption may be less sensitive to changes in wealth, because of the rise in the share of wealth held by older and wealthier households that have a lower propensity to spend out of wealth. If so, models ignoring this distributional aspect may overestimate the negative effect on spending due to a downturn in equity prices. So that's an upside risk.

With respect to inflation, as I mentioned, a stronger appreciation of the dollar poses a downside risk. Escalating tariffs have the potential to unanchor inflation expectations, posing an upside risk to inflation. And another upside risk is related to measurement issues. Dean Croushore's forthcoming paper in the *International Journal of Central Banking* indicates that PCE and core PCE inflation measures are typically revised up between the initial release and the annual revisions. So this could happen again.

In addition to these macro risks, financial stability risks—including high levels of corporate debt, leveraged lending, and loosening credit standards—are rising and make the economy more vulnerable to negative shocks. Now, I note that some of these risks will involve hard choices for the Committee. For example, escalating tariffs pose a downside risk to growth but, if they disrupt inflation expectations, an upside risk to inflation. And members' policy preferences may reflect not only differences in their forecasts, but also differences in how they balance the two parts of our dual mandate—that is, differences in their objective functions.

In thinking about risk, I continue to be struck by the divergence between the considerably steeper funds rate path in the Tealbook and the shallower paths in the SEP median, market expectations, and private-sector forecasts. And I really appreciate the analysis that Eric talked about yesterday of possible sources of these differences.

Now, as I discussed last time, the Tealbook's policy rule is a fairly reasonable description of past policy behavior. It's the Committee that is reacting differently to incoming data compared with the past—in particular, reacting less to the undershoot of unemployment than policy does in the Tealbook's baseline. Now, there may be good reasons to do so, but there's also a risk that the dynamics underlying the Tealbook baseline are correct. For anyone with a shallower policy rate path than the Tealbook's, this can be thought of as an upside risk, and if this risk materializes—that is, if the Tealbook is right—then it's very difficult for me to see how a soft landing will be achievable. How would we be able to shift the expected path of interest rates up to the Tealbook path without generating harmful expectations that we're "behind the curve," that the yield curve inversion will lead to a recession, and with these expectations yielding conditions leading to a hard landing?

Of course, if we found ourselves having to steepen the policy rate path, other assumptions in the Tealbook forecasts would likely change. For example, there could be a stronger appreciation of the dollar than is currently assumed, as Beth Anne's simulation showed. This might limit the need for as aggressive rate increases, and we might yet see the soft landing we are trying to achieve.

At some point, the divergence between the Committee's and Tealbook's policy rate paths will need to be reconciled. Whether the Committee's path will need to steepen or the Tealbook's flatten will depend on incoming information. If growth continues at its very strong pace, labor markets tighten further, and inflation begins to accelerate above target, the Committee's policy rate path will likely need to steepen. But if the Committee follows its current policy rate path and growth begins to move down toward trend, the tightness in labor markets eases, and inflation remains near 2 percent, then the assumptions and underlying relationships in the Tealbook will have to be rethought. Thank you, Mr. Chair.

CHAIRMAN POWELL. Thank you. President Barkin.

MR. BARKIN. Thank you, Mr. Chair. The overall performance of the economy continues to be impressive after two really strong quarters. Consumer spending remains healthy, supported by consumer confidence, full employment, and higher after-tax incomes. The labor market continues to be very strong. The unemployment rate has dropped to its lowest level in almost 50 years. Quit rates continue to increase and, as a result, in our District we're hearing more talk of higher across-the-board wage increases. Inflation remains steady at our target.

The Fifth District performance is in line with the national economy. We survived the two hurricanes. Healthy federal government spending has helped large parts of our District. I'd point here to our recent manufacturing surveys, which hit an all-time high in September, and all eyes in our market are on the upcoming Amazon headquarters announcement, or, if they split it, the "H" announcement.

Of course, as rates increase and the expansion enters its tenth year, we face the question of how long our above-trend growth may persist. We do see in our District, and others have mentioned this as well, the first clear signs of sectoral divergence. We are seeing some sectors that report a less positive outlook, and some have reduced their earnings forecast accordingly. Most prominently, agriculture and food processing continue to be adversely affected by tariffs, and residential housing continues to be relatively weak despite the strength in consumer spending. For example, a large drywall manufacturer reported a decline in shipments, reversing his early-year enthusiasm—a downturn he says is affecting his entire industry.

The community banks in our larger markets report that, in contrast to history, they are feeling squeezed by rate increases as deposit competition lifts rates while the flat yield curve is suppressing their ability to capture higher loan yields. The negative gap between prices received and prices paid in our manufacturing survey has escalated, reinforcing the cost–price squeeze that so many companies are reporting. Ocean freight companies tell me there's been significant front-running of tariffs, leading them to expect a weak start to next year.

I have to say, however, that these reports are still outweighed by the large number of companies in sectors like defense, professional services, IT, transportation, chemicals, and manufacturing that see strong demand, some pricing power in the presence of tariffs and cost pressures, labor shortages driving wages up, and real supply constraints. Our survey measuring availability of skills has also plummeted to all-time lows. For example, a defense contact reports that both defense and civilian aerospace are short of engineers in the context of their rapid growth, leading to delayed order fulfillment by subcontractors and employers planning for substantial across-the-board wage increases. They estimate constraints are taking 2 percent off next year's growth. My former colleagues in consulting tell me I left a year too early.

[Laughter]

You could make the case that this sectoral divergence is a sign of things to come. Indeed, several contacts have used the phrase "canary in the coalmine" a lot to declare their business as the leading indicator of the coming downturn. In that argument, you might point to a number of credible predictors, including the yield curve but also market turbulence, geopolitical uncertainty, residential real estate—and a month ago I would have said oil prices. China and the outcome of elections around the world represents a risk as well. At the moment, though, I attribute this divergence to external events, very much including our rate increases, that are having natural and expected effects. The indicators I mentioned signal risk, not reversal. That said, I'm glad our gradual path gives us time to review more data before December.

CHAIRMAN POWELL. Thanks. President Evans.

MR. EVANS. Thank you, Mr. Chair. The reports received from my directors and other contacts continue to point to robust domestic activity, tight labor markets, and gradually increasing wage and price pressures. I did, however, hear more discussion this round about slowing economic activity abroad. And, of course, there was further talk about tariffs and other trade issues.

With regard to domestic demand, commentary regarding capital spending seems much stronger than what we saw in the third-quarter National Income and Product Accounts (NIPA) data. One of my directors who runs a large manufacturing conglomerate said that sales of cap-ex-related goods were up at double-digit rates almost across the board. Another contact noted continued strong demand on the part of the energy sector, and many other manufacturers also were upbeat. In contrast, residential investment is soft, and the slower activity is being felt by some related businesses such as appliance manufacturers. Another less upbeat anecdote came from a major steelmaker, who, although pleased to have some support coming from tariffs, noted that his order book has not been filling up as he had expected. He said this was at least partly due to weak demand on the part of steel service centers that pay spot prices for steel and are keeping inventories relatively lean in the hope that prices will come down in the near future. The service centers are independent businesses that supply semiprocessed steel to small- and medium-sized manufacturers that do not have scale to engage in long-term contracts.

Steelmakers aside, I continue to hear negative commentary about tariffs and trade uncertainty. A major equipment manufacturer complained that otherwise very strong results were being offset by tariff-related increases in material costs and weak demand from the agricultural sector, which is being hurt by China's retaliatory actions. This person said that if it weren't for that, we'd be firing on all cylinders, as would the rest of the manufacturing sector. And manufacturers in the auto industry supply chain are just beginning to grapple with the likely costs and complexity of the new trade agreement with Canada and Mexico, but they're glad that at least some deal has been struck.

Still, for many businesses, trade-related issues do not appear to be a major current concern, and this is more in line with Beth Anne's commentary yesterday. This round, we surveyed our Beige Book respondents about how they have been affected by higher tariffs. While most indicated that they had seen minimal effect on their businesses, some said it was still too soon to tell. And about one-fourth of the respondents reported delaying some capital spending, while 15 percent said that they had deferred some hiring.

Elsewhere on the international front, a few of my directors and business contacts noted that activity beyond the United States has softened recently. In Europe, the slowdown was particularly significant in the automotive sector, in which new emissions standards have taken effect. A number of contacts talked about the problems in Italy and the difficulties surrounding Brexit, but they can only speculate on whether or not these were influencing growth currently. I also heard reports of slower activity in China and continued weakness in Latin America.

Commentary I heard about labor markets was similar to before. While there were some reports of higher wages and more attractive work arrangements, we still are not in the midst of a breakout in labor costs. Notably, a large temporary-help firm continued to report that average wage gains were still increasing only gradually. Of course, this storyline comes along with many contacts indicating that labor shortages were restraining growth opportunities. Indeed, I heard quite a bit of this when we met with our agriculture, small business, and labor advisory committee last month. Frankly, we’re going to be hearing this complaint for a long time. Business economic analysis indicates that trend growth is being held back in part by slower labor force growth. But many Main Street and corporate businesspeople do not fully appreciate that this means business expansion activity is going to be more difficult in a world in which underlying growth in available labor input is more like ½ percent per year rather than 1 percent. And the loudest complainers may be those with weaker business propositions than margins and an inability to pay up for talent. That means we need to be careful not to interpret all business reports of labor shortages as indicating that we are operating at more than full employment. It could be that some businesspeople have outdated and unrealistic expectations regarding how fast growth ought to be.

Regarding the national outlook, there’s been nothing in the incoming data to warrant more than minor changes to our baseline forecast and our assessment of risks. Like the Tealbook, we expect growth will gradually taper to trend by 2020 and then dip a little below potential in 2021. Our unemployment rate projection falls to 3½ percent by the end of next year, then edges up to 3¾ percent by the end of the forecast period. This compares with my own natural rate assumption of 4.3 percent. Core inflation is projected to move up to 2.2 percent in 2020 and '21. The rate path underlying this projection is also unchanged from last round. It has a gradual increase in the funds rate to a mildly restrictive stance over the course of the next year or so. I think this path is consistent with the Committee's current forward guidance about policy, but I recognize that such communication will become much more challenging as we move into next year. Thank you, Mr. Chair.

CHAIRMAN POWELL. Thank you. President George.

MS. GEORGE. Thank you, Mr. Chairman. The 10th District economy continues to grow faster than the rest of the nation, although growth in both manufacturing and services slowed somewhat in October from its robust pace earlier this year. With unemployment in the region falling to 3.3 percent in September, labor shortages and the ability to find workers are the most common challenges reported from our District contacts.

We are also hearing from a growing number of our business contacts about negative effects arising from rising interest rates. Many of these comments come from the auto or housing sectors, although some manufacturers also noted export demand concerns due to a rising dollar following U.S. interest rate increases.

We're also hearing about the effects of tariffs. A little over half of our manufacturing contacts reported facing more price pressures related to tariffs, while about one-third of service-sector contacts reported higher import prices.

According to our District energy survey, activity accelerated in the third quarter. However, total profits edged lower, as wages and benefits and transportation costs increased.

Contacts reported an average profitable price of near $55 per barrel in the third quarter, up from a range of $50 to $52 per barrel during the previous two years.

Finally, the District's corn and soybean harvest is nearing completion, while the agricultural sector remains in a prolonged downturn, as President Bullard noted earlier. The trade dispute with China, along with elevated production and inventories, continues to weigh on prices and to lower projected revenues, especially for soybeans, dairy, and hog production.

For the national economy, my outlook for growth is little changed since our previous meeting. I expect above-trend growth in 2019 and 2020, driven mainly by rising private domestic demand. I continue to forecast moderate inflation in the next few years, with roughly offsetting effects of a stronger dollar and increased tariffs.

Recent data on business fixed investment show mixed signals. On the one hand, the slowdown in equipment spending was fairly broad-based—suggesting macroeconomic factors are at work. On the other hand, growth in intellectual property investment has strengthened over the past three years, with about half of the growth accounted for by R&D—a positive sign for future productivity growth.

The October jobs report pointed to continued momentum in labor market conditions, with payroll gains averaging more than 200,000 per month in the past six months and a very strong reading for the employment diffusion index for total private industries. I expect the unemployment rate to fall further next year. Measures of wage growth remain moderate, but they are rising.

Regarding prices, the outlook for inflation remains benign. Anchored inflation expectations appear to be playing a central role in the economic decisions of businesses and consumers. This may be limiting upward inflationary pressures that have historically emerged at this point in previous expansions.

With regard to trade policy, our contacts report that tariffs are raising costs, especially for those industries relying heavily on steel and aluminum, although the effects of the tariffs on consumer prices appear to be limited. Analysis by my staff shows that less than one-sixth of the imports from China that are subject to higher tariffs are categorized as "difficult for firms to find alternative suppliers," and only half of those have prices that have a relatively high correlation with consumer prices. To the extent that most firms are able to find alternative suppliers outside China, as suggested by this analysis, the effect of the tariffs on consumer prices should be relatively muted.

Overall, I continue to view risks to the outlook as roughly balanced. I see an increased risk that negative foreign developments may weigh on the U.S. economy. In particular, the recent global equity selloff points to significant spillovers in global financial markets, which may hit the confidence of U.S. investors and consumers. On the upside, the continued strong data on spending and the labor market may portend stronger-than-expected household spending in the period ahead. Thank you.

CHAIRMAN POWELL. Thank you. President Bostic.

MR. BOSTIC. Thank you, Mr. Chairman. I'd like to start my comments with a brief note on Hurricane Michael, which made landfall on October 10 in the panhandle of Florida as a Category 4 storm. Early insurance estimates put the total amount of damage in the $8 billion range. The hardest-hit areas were not heavily concentrated with industry, nor were they densely populated. However, the effect on the region was considerable, and damage to the area's agricultural industry was particularly devastating. Georgia alone lost a million acres of timber.

Local cotton, peanut, pecan, and poultry production were also hard-hit, and it will take years for them to recover fully.

As difficult as these circumstances are for folks in my District, the national effects are likely to be limited. At the macro level, I do not expect to see much of an effect of the storm.

With regard to the aggregate economy, my views haven't changed much since the September meeting. Aside from the latest bout of financial market volatility, the incoming economic evidence has evolved in line with my previous forecast. I continue to expect the pace of growth to step down to trend by the end of 2020.

Sentiment among Sixth District directors and contacts appears to be largely supportive of that view. Most of my contacts describe the current economic environment as strong. However, very few contacts expect the current elevated pace of growth to continue. If anything, I have picked up a bit more pessimism regarding the outlook than I heard the last time. This is certainly the case with their collective expectations regarding business fixed investment. As has been the case for some time, contacts appear to be more focused on replacement and refurbishing of existing structures and equipment than with engaging in expansionary investment. Despite a favorable regulatory environment and ample amounts of fiscal stimulus, firms still seem to be reluctant to place any big irreversible bets with their capital plans, and many continue to cite uncertainty regarding trade policy, market volatility, and, at the time, midterm elections as contributing to this risk-off attitude.

Most contacts were upbeat regarding consumer activity, noting its recent strength, and generally held positive expectations for the upcoming holiday season. But here, too, few of my retail connections are expecting the pace of household spending to ramp up from here. And, consistent with what many today have noted, reports received from my District on labor market conditions paint a picture of further tightening but not a significant overheating. Consistent with aggregate measures of wage growth, reports suggest some firming in labor costs, with most reports citing merit increases in the 3 to 3½ percent range.

Firms in my District continue to voice their concerns regarding rising nonlabor input costs. These views were particularly salient in industries affected by increased tariffs and in industries that incur significant costs related to transportation. As was the case last cycle, these firms were able to pass along these increased costs down the production line without much pushback. For example, a large global manufacturer of lighting products affected by higher costs for electronic components and basic aluminum and steel has successfully engaged in four price increases over the past eight months, increasing prices to its customers roughly 10 to 15 percent. Yet most of this pass-through of rising input costs appears to be primarily occurring in the business-to-business space. We only picked up scattered reports of a pass-through of higher costs to the final consumer.

Among my contacts and directors, there was a variety of views expressed regarding whether the tariffs already put in place will have a meaningful effect on demand. However, there was no disagreement regarding the potential for a negative reaction if tariff rates rise from 10 to 25 percent early next year. To a person, business decisionmakers affected by the current tariffs doubt their ability to absorb an amplification of these costs and are very concerned over the effect that higher prices would have on their future demand. Along these lines, I continue to see inflation running at or near 2 percent through the medium-term horizon. But I am concerned about the potential for tariffs to touch off a bout of significantly higher inflation. If this were a forecast submission round, while I wouldn't change my modal projections, I'd be tempted to shift the risks to my projection from upside to “balanced.” This is due in large part to the potential for trade policy to affect demand nehatively.

Finally, at the previous meeting, I spoke of the increasing buzz around the growing volume of nonbank high-leverage transactions associated with mergers and acquisitions. This was intended to highlight that there are signs that some froth in the economy is starting to be visible, though as of yet these remain on the margins of the economy. And as an aside, I appreciated the QS report’s attention to this and found the analysis reinforcing my concern.

Today I’d like to highlight another such signal—rising delinquencies on consumer credit cards at small banks. As with the leveraged transactions, this is currently not driving the core of the market. However, my S&R folks suggest that troubles in credit card delinquencies tend to manifest themselves in the small-bank space before becoming a broader aggregate issue. So while the aggregate picture is still a healthy one, these pockets of concern suggest that more careful scrutiny of risks is warranted. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President Kashkari.

MR. KASHKARI. Thank you, Mr. Chairman. Moderate growth continues in the Ninth District. Businesses reported a strong third quarter. As has been the story for the past few years, many firms are complaining about tight labor availability, but wage growth at the same time appears moderate. There was some evidence of increasing price pressures, which they attribute to rising input costs. One notable development, as others have noted, is that the housing market is definitely softening—price growth has slowed markedly. And, in our area, ag continues to struggle both because of the tariffs but also because of heavy rains that have affected the harvest.

For the national economy, strong growth continues, mostly driven by strong consumer spending. Investment has weakened notably since the start of the year, which is somewhat of a concern. Nonfarm payroll employment is still rising at about 200,000 a month—it's been remarkably steady since 2011—and labor force participation continues to rise. Prime-age LFP hit a new post-recession high in October but remains about 1 percentage point below the pre-recession peak. The prime-age employment-to-population ratio rose 0.4 percent in October and is now back to its pre-recession level, and while women are above the pre-recession level, men are still notably below. And I really appreciated President Daly's discussion of this yesterday.

Wage growth continues to pick up at levels that are not concerning. The employment cost index is up about 2.8 percent. Year-over-year average hourly earnings are up 3.1 percent. This is great news, and it's especially good that low-wage workers appear to be seeing the fastest wage gains. But is this wage growth likely to be inflationary? The answer is "no." With 1.3 percent labor productivity growth, unit labor costs are rising at 1.5 percent. Thus, labor costs are still rising more slowly than the prices that firms are charging. They're not forecasting high inflationary pressures to come. Core PCE inflation appears to have stabilized around 2 percent, and inflation expectations are essentially flat since the start of this year.

There has been a lot of discussion yesterday and today about the difference between the Tealbook forecast and the SEP, and I can speak about the difference from my own forecast. To me, the most important feature of the Tealbook forecast is this widening gap between trend LFP and actual LFP. And the staff interprets that as an output gap, and the U.S. economy's output gap is growing greater. The longer this goes on, the bigger this wedge becomes between trend and actual. The staff is interpreting that as the U.S. economy running above potential more and more and more. I just don't see any evidence for that. I don't know what's going to happen to LFP in the future, but to me the idea that the U.S. economy is running above potential but it's not showing up in inflation or inflation expectations doesn't make sense. If it's running above potential, the way we would know that is in inflation and in inflation expectations. So to me, if the labor market continues to perform the way it has been, there's more potential than we realized. I don't see that as an ever-increasing output gap, and that's the big difference between the staff's forecast and my own.

One other little example on LFP and demographics. One of my directors is the CEO of a power company, and about two years ago he said, "The power industry has this huge challenge of all these retiring line workers—you know, the men and women, but mostly men, who go out there and fix power lines. It's a big demographic challenge. There's a huge percentage who are retiring in the next few years." So I asked him recently, "What happened? You know, are you able to keep the lights on?" He said, "Oh, yes, no problem. We dealt with it." I said, "Well, what did you do?" He said, "Well, we paid some of the retirees bonuses to stick around a few extra years, and then the new workers who are as yet inexperienced use FaceTime. So they'll go out to a site where there's a problem, and they'll FaceTime a more experienced worker who will walk them through what to do." And his feeling is, "We've dealt with it. It's not an issue." I think examples like this are happening all around the economy. And if people are choosing to work longer in a modest-wage environment, that's good news, and I don't think that that's unsustainable.

Other notable changes—the stock market has fallen modestly, housing markets around the country are slowing, price growth has slowed sharply since the start of the year, and residential investment is falling. It's a concern, as residential investment is often an important leading indicator. And I think weak housing is, in part, due to our tightening cycle, as others have noted.

At the same time, the rest of the world is slowing. Euro-zone growth is only at about a 0.6 percent annual rate in Q3 compared with the already-modest 1.6 percent Tealbook forecast, and obviously there are concerns with other important economies—China, the United Kingdom, Argentina, and Turkey.

So, in summary, the U.S. economy has been growing strongly. Strong continued job growth suggests to me that slack remains. Inflation and inflation expectations remain stable, and there are signs that our interest rate hikes today are now having some effect on the economy. The rest of the world appears to be slowing. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. Vice Chair Williams.

VICE CHAIRMAN WILLIAMS. Thank you, Mr. Chairman. Within the Second District, economic conditions continue to be generally quite favorable. The labor market remains tight, with businesses in most industries reporting steady to modestly rising employment and a growing proportion indicating that they plan to raise wages in the months ahead. Businesses across all industry sectors reported input price pressures, and contacts in most anticipate further increases. A few contacts explicitly cited tariffs for driving up costs. One downside development consisted of what a number of people have already mentioned—that activity in the housing markets has generally slowed since August, and trends in home prices have been mixed across the District.

Regarding the national economy, recent expenditure data—in particular, the consumer spending data—have generally been stronger than I expected, leading to a modest increase in my real GDP growth projection for the second half of the year. Labor market indicators continue to be very positive. The unemployment rate is down nearly ½ percentage point over the past year, and much has been made of the fact that this is the lowest unemployment rate in nearly 50 years.

But as Governor Brainard stressed, this may be comparing apples and oranges, in light of the changes in the demographic composition of the labor force—in particular, educational attainment. If you look at other measures of labor market tightness, however, they're also approaching cyclical peaks. The quits rate is the highest since 2001, as is my favorite measure of labor market slack, the job availability index in the Conference Board survey, which continues to soar. The U-6 underemployment rate is likewise at its lowest level since 2001. And none of these indicators show any signs of leveling off.

The strength of the labor market is starting to be manifested in accelerating compensation. Year-on-year growth in private industry in wages and salaries, as measured by ECI, and average hourly earnings both reached 3 percent. Although better than we've seen in recent years, these numbers are in line with inflation and productivity trends, as President Kashkari pointed out just a moment ago, and so don't yet pose any undesired inflationary pressures. Indeed, core inflation remains right at our 2 percent objective, and I reiterate what Governor Brainard said—that we should enjoy this moment when there's this perfect alignment of the inflation measures. I expect inflation to continue to run near or slightly above this figure over the next couple of years. And although we've seen some softness in core inflation in the third quarter, this was mainly within the core-goods component, and that's been volatile of late. If you look at the inflation rate for core services, that's actually been quite stable.

One risk to my almost too-good-to-be-true inflation outlook is that the tariffs imposed to date could boost inflation more than expected. Analysis by my staff concluded that the CPI inflation rate would be about 0.3 percentage point higher in December of this year than it would have been without the tariffs, with most of this effect occurring through the pass-through to final prices of higher costs of intermediate inputs. For us, this risk suggests the recommendation that we pay close attention to the details of the inflation data in coming months, in order to distinguish between broad moves and underlying inflation, as distinct from price increases stemming from the tariffs.

Finally, as I and President Kaplan and Governor Brainard and many others talked about yesterday and today in connection with the financial stability discussion, market participants have highlighted the risk posed by the large increase in nonfinancial business debt, especially in the leveraged loan and collateralized loan obligation (CLO) segments. I think President Kaplan already laid out the same story that I wanted to highlight. I'll just say that what I've been hearing, and what we've been thinking about quite a bit at the New York Fed, is that you basically have a bit of a financial accelerator going on now with the tax cuts, the fiscal stimulus. Businesses are feeling very high profits. Earnings are high. Investors and banks, according to the SLOOS, are more willing to lend, and we're seeing covenants getting more covenant-lite and other changes in standards that suggest that right now we're in kind of a very positive risk-on environment in the business-lending segment.

The scenario that some of my contacts have highlighted, similar to what others have said, is that with interest rates going up, with growth slowing perhaps more toward trend levels, earnings will likely disappoint as we go forward, default experiences for those firms that do default will generate higher-than-expected losses, and this could turn to a switch from the financial accelerator being a positive influence on business spending and the economy to turning the other way, with a retrenchment in risk-taking and a pullback in the availability of credit and business spending. As I and others yesterday highlighted, I don't see this right now as a particular risk to the financial system. It's more a scenario that illustrates the potential fragility in this baseline forecast of a soft landing that we're hoping for over the next few years.

In that regard, I actually found this special question in the Senior Loan Officer Opinion Survey on Bank Lending Practices, which was about how would you respond to lending conditions or standards in the event of a hypothetical moderate inversion of the yield curve—I want to get the wording right here. I was struck by the responses suggesting that, in the event of a moderate inversion of the yield curve—which I think is kind of fitting into this narrative of a slowdown in growth, higher interest rates, maybe a pullback in credit—that the responses highlighted the reasons that they would tighten in response to this inversion of the yield curve were decreased risk tolerance, less favorable or more uncertain economic outlook, and a deterioration in the quality of existing loan portfolio. I think those are exactly the concerns that we've been talking about, and all I ask for, or kind of what I would like to see, is for us to continue to follow this and also to dig deeper into where these risks may be—who are the end-investors in some of these products?—and to just make sure that we're keeping this particular risk on our radar. Thank you.

CHAIRMAN POWELL. Thank you. And thanks to everyone for your comments.

Like most, or maybe even all, of you, I see the current situation in the baseline outlook as very positive and also very similar to what it was in September. Growth is strong. The unemployment rate is very low and looking highly likely to drop even further. Inflation is right at our target. As always, there are a number of risk factors in the foreign sector, but overall growth prospects abroad remain solid and, on balance, roughly as we saw them in September.

Financial conditions here and around the world have tightened a bit, consistent with policy normalization, and we'll need to keep a close eye on that. But I see no big cracks in our expansion, although, as many of you noted, tighter financial conditions and other factors are weighing on the housing market.

In addition, a number of you reflected in your comments a note of heightened caution or even concern among your business contacts. With no major change in the outlook and this being our very last meeting without a press conference, markets are anticipating little news coming out of this meeting, and I'd be happy if we met those low expectations. [Laughter]

After the strong, if not very surprising, October jobs report, and barring a change in the outlook, this probably leaves us on track to raise the federal funds rate in December, as reflected in most SEP entries and in measures of private-sector expectations. If the Committee does move again in December, and taking account of uncertainty around point estimates of the neutral rate, this would put the funds rate in the vicinity of neutral. And given that, I see this as a time when we should, in effect, put aside our personal point estimates of *r** and focus intensely on what incoming financial market and economic data are telling us about the state of the economy and the stance of monetary policy.

As we look forward, we can see that the median path in the September SEP showed only four more rate increases after December—three in 2019 and one in 2020. So, if things go largely as expected over the next year, the statement language regarding further gradual increases will need to evolve, and now is the right time to begin laying that groundwork. In fact, it seems to me likely that it may be appropriate to adjust our statement language, perhaps in a small way, as soon as the December or January meeting.

As I look ahead to next year, the economic conditions we will face seem unprecedented or nearly so. Many public- and private-sector forecasts show the unemployment rate continuing to fall—reaching levels not seen since the early 1950s in some of them and staying there for a sustained period. I would say that if we do have, roughly in the base case, 18 more months of above-trend growth, it seems to me that the likelihood of unemployment falling below

3½ percent is pretty high. I think I would take the "under" if we have that kind of growth, so we'll see.

Despite this tight labor market, these forecasts also show inflation remaining near 2 percent throughout the forecast horizon. Let's face it. This is a great baseline outlook. But, as always, our job I think is to evaluate what the risks to that forecast might be. And I think the extraordinary nature of these circumstances suggests a number of potential challenges next year, and I'm going to lay out two opposing risks. Some of you focused more on one than the other, and I'm just going to lay out both. I see them both as all too plausible.

First, our policy of gradual rate increases is premised on the view that moving gradually toward neutral rates is the best way to keep inflation near 2 percent while extending the recovery. But there is high uncertainty about the reaction of inflation to sustained unemployment in the mid or even low 3s.

It has been said that the plural of "anecdote" is "data." We are hearing myriad anecdotal reports of rising inflation pressures in the pipeline, but somehow those anecdotes don't seem to be showing up in actual inflation data. At some point, signs of overheating could appear and reveal that we need to move considerably faster or higher.

Of course, today inflation data show few, if any, worrying signs. While wage growth is up, so is productivity growth. There's little in the wage data to signal margin pressures, and in any case, margin pressures like that have not necessarily signaled rising inflation in the past. So we don't see this today, but I think our policy needs to continue to reflect the reality of that risk.

It is equally easy to sketch a particular downside risk, and this story begins with the thought that a number of factors look likely to materially restrain the economy over the next couple of years. So, by December, let's assume that we will have implemented our ninth rate increase. In addition, the balance sheet will have shrunk by $500 billion from its peak by year-end 2018, a significant further tightening. All told, that's a lot of removal of accommodation for a world in which we think the neutral nominal interest rate might be in the range of 2½ to 3½ percent. And there's another $500 billion or so in balance sheet shrinkage coming in expectation.

As we love to remind the public, and often do, our policy works with a lag, and the restraining effects of our tightening may only be beginning to show through to the real economy. As many mentioned, fiscal impetus may begin to dwindle next year. There's some uncertainty around that. And, of course, we know this: The supply of Treasury securities is going to be rising and putting perhaps additional upward pressure on rates. So if you add into that the possibility of trade negotiations causing restraint and put all of that together, there's a real risk, even without any future rate increases—put those aside—there's a real risk that we could see a significant tightening in financial conditions next year at a time when the economy is already slowing because of declining fiscal impetus.

So I guess I see our baseline policy rate path as continuing to be about right, but we do face these substantial two-sided risks. Pent-up inflation pressure could demand more or more rapid tightening, or pent-up policy restraint could mean little, if any, further action is needed. So what that suggests is that we need to stress that our policy rate path is highly data dependent, and we will be alert to what the economy and financial conditions are telling us about our policy stance. Thanks. And I'll now turn it over to Trevor for the monetary policy briefing.

MR. REEVE.[6] Thank you, Mr. Chairman. I will be referring to the handout labeled "Material for the Briefing on Monetary Policy Alternatives."

Alternative B is summarized in the upper-left panel of the first exhibit. This option is based on the view that the economy has been evolving broadly in line with

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

expectations and that, as a result, the outlook for policy implied by recent FOMC communications remains appropriate. Under this alternative, the Committee would maintain the target range for the federal funds rate at this meeting and reiterate its expectation that further gradual increases in the target range will be consistent with achieving its goals.

The chart to the right illustrates how the phrase "further gradual increases" is reflected in financial markets. The solid line shows the expected path of the federal funds rate obtained from federal funds futures quotes, assuming zero term premiums and no rate changes between FOMC meetings. The path suggests that roughly three 25 basis point hikes are priced in between now and the end of next year. It is also evident that market participants continue to attach higher odds to rate hikes occurring at meetings accompanied by updates of the SEP than at meetings without an update.

The middle-left panel outlines alternative C, which is written from the perspective that increasingly high levels of resource utilization are leading to an unwelcome buildup of inflation risks. Under this alternative, the Committee would raise the target range for the federal funds rate and indicate that further gradual increases are likely to continue "for some time." Such a statement would signal that the federal funds rate will likely need to rise to a higher level than has been implied by previous communications in order to forestall eventual increases in inflation.

While the rationale for alternative C may not resonate with you in the current environment, such a statement could be considered in a future contingency in which the probability of above-target inflation outcomes increases substantially. The middle-right panel shows the subjective probabilities of various year-ahead outcomes for core PCE inflation as given in the Survey of Professional Forecasters. The darkest blue bars plot the most recently available data, while the lighter blue bars show results for one and two years earlier. The probabilities for year-ahead core inflation outcomes above 2½ percent have moved up significantly over this period. While these probabilities are not alarming at present, they do indicate an upward shift in the balance of risks for inflation.

In contrast, alternative A, outlined in the lower-left panel, is motivated by the belief that the current stance of monetary policy is appropriately at, or very close to, neutral. Hence, further increases in the target range for the federal funds rate could unduly slow the economic expansion and undermine the sustained return of inflation to the Committee's 2 percent objective.

To provide some perspective on how close to neutral the federal funds rate may be, the lower-right panel shows the recent history of the real federal funds rate, in black, as well as the mean of estimates of the neutral rate using various models, the blue dashed line, and the range of the model estimates, the blue shading. Also depicted are the medians of the September SEP submissions for the real federal funds rate, indicated by the red diamonds, and the central tendency of SEP estimates, denoted by the whiskers. If the real federal funds rate follows the median SEP path, it could reach the lower end of estimates of neutral before long and the mean estimate by the end of next year.

While you may view alternative A as premature in current circumstances, if the economy evolves as expected, such a statement could be considered in the future when the Committee judges that further increases in the target range are no longer warranted. To smooth the transition from the current policy statement to something like alternative A, the Committee may want to begin considering options for altering the current statement language in a manner that recognizes the passage of time while not necessarily signaling a change in the intended monetary policy path.

The Committee faced a similar decision in late 2005 and early 2006 as it shifted from guidance characterizing the "measured pace" at which policy accommodation could be removed. This experience was discussed in a box in Tealbook B, and your next exhibit builds on that analysis. The top panel illustrates how market participants' expectations of the future course of monetary policy evolved with changes in the Committee's policy statement. The banner at the bottom of the chart shows key phrases in the policy statements over this period. The blue line depicts expected changes in the federal funds rate over the next 6 months, obtained using a straight read of federal funds futures quotes and using the scale on the right. The red line shows the expected changes 6 to 12 months ahead. For reference, the federal funds target rate is plotted in black using the scale on the left.

Over the period from May 2004 to late 2005, during which the statement indicated that "policy accommodation can be removed at a pace that is likely to be measured," market expectations of policy tightening over the next 6 months remained around 75 basis points—reasonably consistent with the pace of increases of 100 basis points that ultimately occurred. At the same time, expectations for the 6-to-12-month horizon drifted lower as the actual federal funds rate rose. By January 2006, the "measured pace" language had been removed from the statement, and the Committee instead indicated that "some further policy firming may be needed." With that transition, expectations of tightening at the 6-to-12-month horizon fell to zero, and those for the immediate 6 months drifted lower. Over the rest of 2006, Committee participants saw the policy outlook as becoming less certain and increasingly dependent on incoming data. In May, the Committee further modified its language to emphasize that "the extent and timing of any such firming" would depend on economic developments and the outlook. The language was softened further in June, when the Committee made its final rate increase. Soon thereafter, expectations of any additional tightening fell to zero and then gave way to expected reductions in the federal funds rate. It was not until March 2007 that the policy statement dropped all references to the "firming" of policy and mentioned only "adjustments."

The middle panel of the chart is an analogous depiction of the current cycle. The banner at the bottom shows the subtle changes in the policy statement, moving from "only gradual increases in the federal funds rate" to just "gradual increases" and then, at the beginning of this year, to "further gradual increases." Expectations of tightening at both the 6-month and the 6-to-12-month horizons remained fairly modest in the early part of this cycle but firmed somewhat late last year and have since remained broadly stable. Over the course of this year, market participants have expected one to two 25 basis point hikes in the federal funds rate over the coming six months and another hike or so 6 to 12 months ahead. A key question is what sequence of adjustments to the language in the FOMC statement might help bring the red and blue lines closer to zero when and if this adjustment in market expectations is desired by the Committee.

Drawing on the experience of the previous tightening cycle, the bottom panel offers some possible options for adjusting the statement language when you judge that the time for doing so is right. As noted previously, the prescription in alternative A simply drops any reference to future increases. However, the Committee may want to continue to signal that additional rate increases are likely, but with less conviction and greater optionality. For example, the statement language could be amended to state that the Committee expects "some further gradual increases" in the federal funds rate or that the Committee "judges that some further gradual increases may be warranted." To emphasize the role of data dependence, the Committee could state, as in 2006, that "the extent and timing" of any further increases will depend on the evolution of the outlook. However, the current statement already contains a sentence in paragraph 4 about data dependence. This sentence could be amended by deleting reference to "future adjustments" and instead saying, "In determining the timing and size of any additional increases in the federal funds rate, the Committee will assess realized and expected economic conditions relative to its maximum-employment objective and its symmetric 2 percent inflation objective."

Thank you, Mr. Chairman. That completes my prepared remarks; the September statement and the draft alternatives are shown on pages 3 to 10 of the handout. I'll be happy to take any questions.

CHAIRMAN POWELL. Questions for Trevor? President Rosengren.

MR. ROSENGREN. One difference between the language used before and the language that we may be using now is that we have the SEP in addition. So how does that affect your thought process on language, in light of the fact we're independently doing our SEP—let's say that we had both a median of an increase in December and, let's say, three increases over next year. Does that alter how you think about the language in the statement? Because, ideally, you want these to be giving similar, not different, messages, particularly given the focus on the median SEP. So, what are your thoughts about how we coordinate an activity that, right now, really isn't that coordinated?

MR. REEVE. I think it's obviously very important that the views that are expressed in the policy statement are, at least, not contradicted by the SEP. If that occurs, that's an unfortunate outcome that I think complicates the communications. But overall, I would view the existence of the SEP—which, of course, you didn't have in the previous tightening cycle—as being very beneficial in helping transition the language, in the sense that if you want to make changes to the statement, you can do so in a way that may or may not reflect a change in the outlook for policy. That was a little harder in the earlier period, in which there was not the SEP to refer to.

One example of this just occurred with the removal from the statement of the characterization of the stance of policy as being accommodative. I think there was much greater concern doing that back in 2005 and 2006 than now, because now—and this actually occurred, right?—you could take that out, point to the fact that the SEP had not changed, and really make the point that this change in language really reflects the passage of time and where we are in this cycle, as opposed to changing policy views. So, in many respects, I think the SEP can be your friend in helping the process in which the language evolves.

The other point I would make about a difference now from back then is, now the Committee does have an explicit inflation target of 2 percent. That was not the case back then, and there was a lot more ambiguity about what inflation outcomes the Committee was trying to achieve. And I think that complicated the sense of how much further tightening was meant to be communicated through the statement and through other communications.

CHAIRMAN POWELL. Additional questions? [No response] Seeing none, I propose that we take a little coffee break before we do our comment round. And we'll ask you to come back at 10:45. Thanks.

[Coffee break]

CHAIRMAN POWELL. We still have a minute for—we'll give President Kaplan 52 seconds. [Laughter] All right. The official clock, which may be incorrect, actually—but that's the official clock right there. That's the one I can see. So why don't we resume with our monetary policy go-round, beginning with Governor Clarida.

MR. CLARIDA. Thank you, Mr. Chairman. I support alternative B as written. It is consistent with our strategy of a gradual normalization of the policy rate. With the federal funds rate now just at or slightly above our inflation objective, monetary policy remains accommodative. That said, as I discussed yesterday in the outlook go-round, borrowing costs in most sectors of the credit markets are above—and, in some cases, well above—levels that prevailed before the first rate hike in December 2015. And the dollar is likely to continue to receive support as we increase rates further. Because monetary policy operates with a lag, the effect of higher borrowing costs and the dollar on aggregate demand has yet to be fully felt outside the housing sector but, I believe, will become more evident next year just as the fiscal impulse diminishes. My baseline expectation is that a higher supply of Treasury securities and the ongoing reduction of our balance sheet will continue to put upward pressure on the real term premium, which, other things being equal, will also pass through to borrowing costs in the credit markets.

I agree that the incoming macrodata leave us on track to raise the funds rate in December, which would put the funds rate very much in the vicinity of estimates of r^*. And I also believe that the statement language of "further gradual increases" will likely need to evolve, and that we should give serious consideration to doing this at the December meeting.

To me, monetary policy must be data dependent—perhaps even more so at this stage of the rate hike cycle. And, with the uncertainties surrounding estimates of *r**, monetary policy at least to me is not on a preset course. As the case study in Tealbook B and the discussion this morning remind us, the FOMC has, in the past, provided guidance in the statement on the likely future evolution of the policy rate some meetings before the cycle concluded, and I believe that that will likely be appropriate in this cycle as well. Thank you.

CHAIRMAN POWELL. Thank you. Governor Quarles.

MR. QUARLES. Thank you, Mr. Chairman. I, too, support alternative B as written. It's consistent with the gradual path of policy tightening that we have communicated.

As I discussed yesterday, though, I remain optimistic about the path of potential GDP, in line with my new "spirit brother," President Kashkari—as long as we're not talking about bank capital. [Laughter] So I believe we can be gradual in removing accommodation as increases in the productive capacity of the economy allow strong growth without overheating. Accordingly, as I suggested in our previous meeting, I would be open to not moving in December and waiting until January or even March. But my attachment to that view is not dementedly adamant,as I wouldn't view this as a pause—but instead as a more gradual slope of a continuing path—and, therefore, don't view a shift in timing between a hike in December relative to early next year as being all that material.

To step back a bit, in charting our course for policy over the next year or so, absent any shocks, I imagine that our discussion will often gravitate toward the high degree of uncertainty over the unknown and unobserved fundamentals of the economy, including measures of labor slack, the relationship between labor slack and inflation, the sensitivity of current inflation measures to actual resource constraints, and the future growth of productivity, to name just a few. And in such an environment, a lot of people have argued that that fundamental uncertainty leaves us without a clear guide and market participants without a firm anchor, meaning that policy could drift, perhaps dangerously. And I don't think that's the case at all. I think that this situation reinforces and supports the importance of a clear and steady strategy and a gradual, predictable approach to the removal of accommodation. As we continue to monitor the data, precisely because of the uncertainty regarding the course inputs, the right strategy is to set a course, communicate that course clearly so everyone knows what you're doing, and stick to that course steadily, even as the data might waver in one direction or another. If we get a signal from the data that is substantial and stays there pretty consistently, then we should make a small, firm correction, but even then, only gradually and with a clear communication about what we're doing.

So, rather than fearing that policy will drift because of the current uncertainty regarding a number of these measures, I think it means that we should chart a course that's stable, gradual, and predictable; communicate it clearly; and then follow that course through the temporarily shifting and sometimes conflicting signs from the economy unless there's a strong and steady signal that requires a firm but moderate correction.

Given that the economy has performed fundamentally as I expected at the outset of the year, the right strategy is to maintain the gradual course that I've thought appropriate for some time now. Or, put another way, while I think there's enough reason to think that the productive capacity of our economy might be increasing, so we shouldn't feel compelled to accelerate our pace, I also think there's enough doubt about current inflation as an infallibly reliable measure of current resource constraints that the continued gradual removal of accommodation is appropriate.

Now, at the outset of our two-day meeting, I bet David Wilcox five bucks that I could get through a full FOMC meeting without the words "don't chase the needles" appearing in the transcript. And I am pleased—uh oh. [Laughter] Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President Rosengren, please.

MR. ROSENGREN. Thank you, Mr. Chair. I support alternative B at this meeting. Unless the economy significantly underperforms relative to my forecast, it will be appropriate to raise rates at the December meeting.

While there are many risks to the economic outlook, including fiscal issues in Italy that could disrupt Europe, a slowing of many emerging economies, and the effect of tariffs and a possibility of a stronger slowdown in China, these are all risks to what is a very strong baseline forecast. And I do not view recent volatility in financial markets, which partly reflects the recalibration of these risks with incoming data, as significantly altering the baseline forecast.

In terms of communication, I am supportive of gradually removing forward guidance from the statement, although it is premature to do so now. I think the time may come soon when our language should be clear that future adjustments will depend on the effect of incoming data on our forecasts of inflation and unemployment.

While we might intend such language to give us flexibility to move either more or less quickly, markets could interpret data-dependent language as a signal that we are preparing to take a significant pause in tightening. Unless one of the risks I have just highlighted materializes and significantly weakens our forecast, I would choose our language carefully so as not to lend that impression. Indeed, I think a continuation of gradual increases is most likely to be appropriate. If my forecast is right and inflation continues its gradual but steady increase, our challenge will be to avoid speculation that we have fallen behind the curve. Such a perception could lead to an overreaction in longer-term rates and other asset prices, disrupting financial markets and potentially putting the recovery at risk. Thank you, Mr. Chair.

CHAIRMAN POWELL. Thank you. President Bullard.

MR. BULLARD. Thank you, Mr. Chairman. I support alternative A for today. I don't think we should be planning further policy rate increases, but only pursuing those increases if the economy continues to surprise to the upside.

In my opinion, we've already been very preemptive in getting to where we are today, which I think is a very good place—inflation at target and the economy performing very well. But we've already normalized policy a lot—200 basis points off zero in an environment in which other major economies have not moved off zero—and started to shrink the balance sheet, which is now coming online in a more forceful way in the second half of 2018 here. So I think we're in great shape. We've been preemptive. I realize we're not going to take "further gradual increases" out at this meeting, but I would take them out at the December meeting.

I want to devote the bulk of my comments to ideas about modernizing the inertial Taylor (1999) rule, and I'm going to echo some of the comments that President Mester made about how that rule is shaping the policy options before the Committee. We had some of this discussion yesterday as well. The inertial Taylor (1999) rule forms a baseline for thinking about the current stance of U.S. monetary policy. It was used by former Chairs Bernanke and Yellen in major speeches. The rule was developed in the late 1990s and based on data from the 1980s and the 1990s. A great deal has changed in the past 20 years in the U.S. economy, and I think we should think about ways to modernize it. It's time to modernize.

The payoff would be that we might be able to develop a rule that better articulates what many are thinking about the current stance of policy, in light of the experience of the past 20 years. I would say this is true both inside and outside the Committee. It might provide a better benchmark for discussion.

So, what is it that needs to be done to modernize the inertial Taylor (1999) rule? There's no surprise about the answer. There are three areas that have been widely discussed here. First, the intercept term, the so-called *r**, has been declining for 30 years and should not be expected to change meaningfully over the forecast horizon. Second, the Phillips curve is quite flat, so the responsiveness of the rule to output gaps should be attenuated. And, third, the inflation gap should be measured in a more forward-looking manner.

Let's take each of these in turn. On *r**, the real short-term safe interest rate, we've had extensive discussions around the table here. I have my own contribution, "R-Star Wars: The Phantom Menace," which was given earlier this year and was named in honor of John Williams. [Laughter] I would step back, though, for this discussion and just say that any measure of the real short-term interest rate has declined dramatically since the 1980s, on the order of 600 basis points. A simple atheoretical idea would be to just take the trend as given and driven by forces outside the control of this Committee. And the major factors across studies that get cited are declines in the productivity growth rate, declines in the labor force growth rate, and, above all, the increased demand for safe assets globally. All of these factors have driven the safe real rate lower over the past 30 years. I think we should just take this as given. If you draw a simple trend through the data—forget about models, just do something atheoretical—you'll get an *r** value close to zero. So that's the first change I would make.

Second, on the Phillips curve, obviously we have a very flat Phillips curve. I think that in the earlier period, the '70s and '60s and some of the '80s, it made sense that with unanchored inflation expectations, you could see correlations in the data that were well documented and became dogma, I think, within macroeconomics. In the inflation-targeting era since 1995, those correlations have declined nearly to zero. Chairman Powell gave a speech just a few weeks ago that had an excellent chart documenting the decline in the slope of the Phillips curve. So I do not think, in this situation, we can read future inflation developments off output gaps, as is often discussed around the table here. My solution is that, in the Taylor (1999) rule, you should attenuate the coefficient on the output gap by a factor of 10, which would get to Chairman Powell's picture there. So it'd be a much smaller coefficient, reflecting the idea that there's not a lot of feedback between the real economy and inflation.

And then on the third part, the inflation gap, John Taylor did not have a TIPS market in the late '90s, but now we have 20 years of data on TIPS-based measures of inflation expectations. I would like to replace the inflation gap in the policy rule with an inflation-expectations gap. This would give us a more forward-looking component and will send a signal to us if we're getting behind the curve on inflation in the minds of market participants. Putting an inflation-expectations gap in there would reflect the idea of modern macroeconomics that it's really inflation expectations that are the dominant factor in driving actual inflation outcomes, more so than output or labor market gap measures.

With these three modernizing changes, we can derive some useful policy advice from the rule, taking on board the developments of the past 20 years. If you put together a rule like this—and I do have a slide deck on this called "Modernizing the Taylor Rule"—it does suggest keeping the policy rate approximately where it is today over the forecast horizon. It basically sends a message that we're at neutral or very close to neutral today and data dependent as we go forward. Like with all policy rules, future developments would depend on future economic developments.

If you don't like these modernizations, you can get similar results in some of the optimal control exercises in the Tealbook—in particular, the ones featuring asymmetric loss functions. With asymmetric loss, the Committee would be concerned about unemployment above the natural rate but not too worried about unemployment below the natural rate as long as inflation was not becoming destabilized by such a development. So if you have this idea of keeping an eye on inflation expectations through the TIPS market, you're going to get that signal through that channel instead of worrying about where exactly the natural rate of unemployment is and whether the low rates of unemployment are going to produce inflationary pressures.

A final comment on this is that this concept of what we're doing here is inflation based. It's designed to keep inflation at target. What about financial stability? And many have commented at this meeting and at other meetings about financial stability concerns. I think it's perfectly fine for the Committee to decide to raise rates to keep financial stability intact. However, if we do so, I think we should say that that's why we're doing so, and I think we should also examine what the tradeoff would be with the inflation goal. You might raise because you're trying to maintain financial stability, and you may want to say that we're willing to miss our inflation target, let's say, to the low side because we want to take other actions to prevent a financial crisis in the future. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. Governor Brainard.

MS. BRAINARD. Thank you, Mr. Chair. As we discussed yesterday, despite recent financial volatility, economic activity continues to expand strongly, in line with our previous expectations. If the data between today and our next meeting confirm that outlook, it will be appropriate to see the next hike in December.

The gradual pace of increases that is anticipated by the SEP median in September remains appropriate, in my view, to balance two key considerations. First, it balances the upside risks associated with the economy's strong underlying momentum, which is reflected in a rapid pace of resource tightening, with inflation and employment at or beyond our objectives and with additional fiscal spending still in the pipeline. Inflation readings have now been coming in around the Committee's objective for several months, and a combination of tight resource utilization and the possibility of increasing tariffs poses some upside risk. Second, against this, there's downside risk coming from a combination of heightened trade tensions and slowing momentum abroad. In this environment, a gradual pace seems most appropriate to balance those opposing forces.

The tightening of financial conditions we saw in the intermeeting period does warrant some adjustment to the outlook, as President Evans suggested. But although the timing and magnitude of those adjustments were noteworthy, they warrant only a very modest adjustment to the baseline outlook. Even with this adjustment, I still expect above-trend growth will continue well into next year in light of strong underlying momentum and fiscal support. If, instead, recent adjustments in financial conditions presage a loss of momentum domestically, perhaps associated with a turn in the credit cycle, then I would be prepared to adjust the expected policy rate path appropriately. But at this point, I consider these to be downside risks. Upside risks seem no less likely, and this might argue for a somewhat less gradual path.

I appreciate the opportunity to think about how the statement language might evolve over the medium term. I wonder if the historical policy episode presented today is too constraining a guide to the circumstances we may face toward the end of next year. That approach suggests we would retain forward guidance and modify it sequentially by providing additional qualitative language about the future path of rates. Like President Rosengren, I wonder if we should consider an alternative approach to modifying communications over the medium term, which might be to complete the shift from forward guidance to data dependence. We've taken some important steps in that direction in cleaning up the statement over the past year by removing qualitative forward-guidance language in two other areas. Completing the shift from forward guidance to data dependence should be greatly facilitated by two post-crisis innovations: the Summary of Economic Projections at every second meeting and press conferences by the Chair at every meeting starting in December.

My baseline outlook calls for continuing the gradual pace of rate increases. If the data continue to confirm that outlook, this will give us some time to think about carefully managing the final steps away from forward guidance and toward data dependence—which would provide flexibility to respond to changes in economic circumstances in either direction more nimbly. It would also leave us with a simpler and clearer statement. I hope that we can return to these issues in future discussions. For now, I support alternative B. Thank you.

CHAIRMAN POWELL. Thank you. President Mester.

MS. MESTER. Thank you, Mr. Chair. I support alternative B today. I believe the language in alternative B will keep expectations regarding a December rate increase intact and will have little effect on the expected policy rate path further out, so I also support it.

My preference would have been to mention a modest slowdown in the housing market in the first paragraph. I think it's useful to indicate that we understand that our rate increases are having an effect on interest rate–sensitive sectors. That is, after all, the transmission mechanism through which policy brings an above-trend economy back to a sustainable pace. However, this is a quibble.

Although I think the downside risks to real GDP growth are slightly higher than they were at the time of our previous meeting, I'm comfortable characterizing the risks as roughly balanced. However, this locution in the statement is opaque. Are we saying that risks to our growth outlook are roughly balanced and the risks to our inflation outlook are roughly balanced? Or are we saying something about how we are balancing risks to growth against risks to inflation? This language becomes particularly difficult to interpret in the presence of risks like tariffs that affect growth and inflation in opposite directions. Now, I do think it's useful to give some indication of the risks we see to our outlook, and in future statements, I hope we clarify the current language we're using.

It seems clear that we need to determine how our statements will evolve as interest rates near the range of estimates of the longer-run neutral rate. I appreciate the box reviewing the language used from June 2004 through March 2007 as the Committee commenced, ended, and moved beyond its previous tightening cycle. Although not a fault of the language, let's hope we end up in a better economic place this time around. Thank you, Mr. Chair.

CHAIRMAN POWELL. Thank you. President Barkin.

MR. BARKIN. Thank you, Mr. Chair. I also support alternative B as written. We all know the path of gradual rate increases will end at some point. The data may make this decision relatively easy. We would naturally pause if growth and employment falter, especially if inflation starts to lag. And we could accelerate rate increases if inflation starts to spike. But if the economy stays on the course our SEP forecasts contemplate, we will face the more difficult question of when we should pause and what would drive a pause.

I'll make three points. First, in that baseline outlook, I think we should move to neutral but don't see a case yet for becoming restrictive. Second, that said, I see the neutral rate as being higher than the Committee's median, and I'll discuss that. And, third, I think the balance of risks, at least as they exist today, should encourage us to explore whether that higher rate isn't appropriate. And I'll discuss each in turn.

Why stop at neutral? Like many of you, I don't see the case to move to a restrictive policy as long as inflation is still controlled and financial excesses and supply constraints are not widespread. Without those alarm bells flashing, it would also be challenging to communicate, as it might appear that our objective is to take unemployment up, especially when the natural rate of unemployment may be drifting down.

So then, what is neutral? I appreciate the Chair's admonition to not worry about point estimates, but I did prepare this in advance, so I ask for his forbearance. [Laughter] We know that *r** is uncertain. All of our favorite estimates have large confidence intervals. My SEP estimate of *r** is the highest around the table at 3½ percent, representing productivity growth of 1 percent and labor force growth of ½ percent. I do see the past 10 years of productivity and real rates as abnormally depressed by what was, I hope, a once-in-our-lifetime financial market failure—in other words, not a normal set of data. While business dynamism may indeed be persistently lower, I am hopeful that business confidence will be driving investment and will bring greater productivity growth in the years ahead.

I am cautious about overreliance on judgment and anecdote, though. So I wanted to check my thinking about the real economy and how it relates to *r** against some analytics. I asked my staff to test how far *r** might move if the economy performs according to several scenarios.

We started with the Lubik-Matthes model. I am aware there are other models, but this Thomas was the one most available to run my targeted analysis on short notice. We focused on the SEP median scenario for growth, unemployment rates, and inflation. And under that scenario, *r** moved up 80 basis points from the second quarter of 2018 to the fourth quarter of 2019. Under the Tealbook path, it moved even higher.

The direction of these dynamics was sensible. If we continue to grow above perceived potential as rates increase, that gives a positive signal of the economy's potential. And while other models may be less sensitive to incoming data, the directional effects should be the same. An economy that stays on course will naturally lead to upward revisions of model-based *r**. And, incidentally, that gives me some reassurance about my own judgmental higher *r**.

The good news is, despite our thirst for precision, we don't need to get it perfect, as evidenced in the staff analysis in June and even yesterday that shows similar outcomes for the economy using the Tealbook baseline funds rate path or the much lower SEP path. And I'm comfortable that 50 basis points either way won't amount to a massive mistake. We have some latitude to modestly overrestrict or overstimulate. But we do need to think about the balance of risks. Would we prefer to err low or err high? Of course, there are risks on both sides: overheating and inflation versus premature recession. But I don't think—at least I don't think today—that those risks are symmetric.

I do think the economy today is clearly closer to overheating than to needing stimulus, which makes the case for erring a bit on the high side. And if we're wrong, it will be straightforward to lower rates. In contrast, if we stop too soon in raising rates, perhaps during a time of reduced fiscal stimulus, that would require strong political will. In addition, if neutral rates do turn out to be higher, that raises the gap to the zero lower bound. I do have to say that my staff is engaged in a spirited debate about whether this is of any real benefit.

So, given that I think we should move toward my relatively high estimate of neutral, what path should we pursue? If the data continue as we expect, I would continue with our policy of steady increases and presume we would arrive at neutral sometime by the end of 2019. Of course, we'd be data dependent, as outlined earlier, particularly if the economy starts to slow.

Regarding communication, we might want to emphasize neutral rather than restrictive, unless inflation spikes, and introduce the notion that the economy's performance could move the neutral rate over time. And as an aside, it might make sense to introduce versions of alternatives A and C that represent more moderate modifications, such as one that would describe a continued gradual path with less frequent increases or one that would describe a higher neutral rate and, therefore, more increases. I find today's descriptions almost a little extreme—one is, inflation is about to spike, and the other is, we're going to stop for good. And I think there are more practical choices.

In a recent speech and even today, Governor Quarles used an analogy of flying a plane. Maybe I'll try to bring in another upper-middle-class avocation [laughter]—my passion for golf. If you've got a long, uphill putt to get it in the hole, you need to hit it pretty hard. Otherwise, there's no chance to make it. The risk of going past the hole is limited because the hill gives you room to be aggressive. Of course, you don't want to go so far past that you leave yourself a long downhill putt. Thank you.

CHAIRMAN POWELL. Thank you. President Harker.

MR. HARKER. Thank you, Mr. Chair. I support alternative B as written, but I remain undecided as to whether a rate hike will be required in December. As always, incoming data will guide my decision, but I see little sign of economic overheating or of inflation accelerating. Additionally, I see the balance of risks tilted to the downside, and the uncertainty surrounding my forecast has increased. There's continued uncertainty with respect to trade and how much of the current growth is due to the effects of fiscal policy that will wane over time.

Further, financial markets have been largely sending negative signals since we last met. Stock prices have declined worldwide, the term structure remains very flat, and some risk spreads have increased, although they do remain at low levels.

The decline in stock prices, as well as their increased volatility—though volatility measures are not overly high, I note—could damp consumption, as in the staff forecast. The fact that the decline in stock prices is a worldwide event suggests that global economic strength could be waning. It is true that the stock markets predict many more downturns than actually occur, but they're not always wrong. As I mentioned, corporate bond spreads have also edged up, and this, too, is a signal pointing in the wrong direction. With inflation showing no signs of acceleration and inflation expectations stable, it may be that we are closer to neutral than most SEP submissions indicated at our previous meeting.

As the Chair alluded in his speech in Jackson Hole, "star" variables are surrounded by a lot of uncertainty. Technically speaking, these "stars," to me, currently seem to be twinkling a lot more than usual.

On the question of the statement language, I would be supportive of moving sooner rather than later to remove forward-guidance language. And Trevor's third alternative in the box on page 2 would be something I would support.

The other is just simply a nit. Reading alternative C, I was struck by this in paragraph 2, the last sentence that was added: "The Committee is monitoring inflation developments closely." If I were a smart aleck, which I have sometimes been accused of being, I would ask the

Committee, "Don't you always monitor inflation closely?" I think it's language that, if somebody did want to criticize us, they could. Thank you, Mr. Chair.

CHAIRMAN POWELL. Thank you. President Evans.

MR. EVANS. Thank you, Mr. Chair. There's not much to say about the policy decision for today. I support "no change" today, and alt-B sums it up pretty well. But the box in Tealbook B and Trevor's briefing remind us that we have some work ahead in deciding how to change the statement's guidance about the funds rate.

My view of appropriate policy is pretty close to the September SEP median. I see moving the funds rate target range to 3 to 3¼ percent by late 2019. That would be mildly restrictive under my estimate of 2¾ percent for the long-run neutral rate.

My outlook is premised on no additional shocks and holding the funds rate at this range through the remainder of the projection period and perhaps beyond. Because my baseline path contains four more quarter-point increases, my immediate policy views are well described by the current statement language indicating that "further gradual increases" in the funds rate likely will be appropriate. But this language won't work after the next couple of moves. Even if there are no surprises in the incoming data, our uncertainty over *r** means it will be prudent to continue assessing conditions carefully to gauge the stance of policy.

If financial conditions end up imparting more restraint than expected today, this could well mean that our rate cycle tops out in June at 2¾ to 3 percent. Or if the economy is still roaring along, we may need to prepare the public for several additional policy moves. Before we get to such decision points, we're going to need a more flexible policy statement that communicates this data dependence.

At this point, I should have inserted some clever comments about data dependence, because that's what all of this is about. Maybe I'll pull out the T-shirt that President Williams gave me a few years ago about how monetary policy is all about data dependence. We keep going around on that.

I would say the lessons of our statement adjustments in 2005 and 2006 were instructive. I could see us going through a similar progression as we move through our next several meetings. Of course, the situation now is somewhat different than it was in 2005. The statement doesn't have to do as much heavy lifting as it did back then. Thirteen years later, our quarterly SEP report—and now eight press conferences annually—will provide a more explicit view of where participants think policy will be headed. Indeed, the Chair can give quite nuanced explanations in his press conference. I think we, as a Committee, should consider this entire range of communications as we discuss the upcoming changes in the statement. Thank you, Mr. Chair.

CHAIRMAN POWELL. Thank you. President Daly.

MS. DALY. Thank you, Mr. Chair. I support alternative B. The economy continues to grow well above its potential and has pushed past full employment. Now, this is true even when I take into account some additional upside potential on labor force participation and productivity, although perhaps not enough to have me be a "spirit sister" to Governor Quarles and President Kashkari.

But, historically, the concern is that such boom times, in the United States and abroad, have tended to result in elevated inflation, financial excess, and other misallocations. We don't face serious problems yet, at least not in my judgment, but it's prudent to at least return to a neutral stance. And here, as the Chair and others have noted, neutral is not a clear target. It's not a point estimate we can just hit. So in that regard, I support the ongoing gradual pace of policy tightening, where I view "gradualism" as a process of iterated learning guided by incoming data. That is, we take a policy action, we wait, we learn about the economy's response, and then we repeat. And the information gathered through this gradual approach is crucial for determining the size and speed of additional adjustments.

So in this regard, I appreciate this morning's discussion, because I find myself drawing increasingly near to not being completely certain that the projection I write down today will be the one we'll see in the economy a year from now. More simply stated: I'm more uncertain looking forward than I was perhaps a year ago. So it is an appropriate time to think about the language.

As I do this, as I look to the risk, there are several features of the economy I'll be watching closely over the next year. First, while the media has outed me as a believer in the Phillips curve, I'm aware it's a rough guide, and it's not a precisely calibrated tool. So while wages are accelerating and inflation has moved to our target, the linkages, for me at least, between slack, wages, and prices remain murky. I'm not at all sure that we're going to see these forces of supply and demand reveal themselves in real time, and there are several wedges that could break the links, at least in our observation, between further declines in the unemployment rate, wages, and then, ultimately, to prices. So I'll be watching that closely.

The second thing to watch closely is the effects of fiscal policy. It remains uncertain to what degree business tax cuts will boost capital spending on a sustained basis and whether higher government debt will lead investors to demand higher term premiums.

Finally, while the Phillips curve gets all of the attention, the slope of the IS curve, as we discussed a little bit yesterday, is just as important for monetary policy. For example, it would be important to know whether the early readings on the effect of higher interest rates, notably the cooling of the residential sector—and I appreciated President Mester's discussion about that—are in line with our expectations.

On a related note, I am very interested in watching, as Governor Clarida noted yesterday, whether the economy has some self-restraining mechanisms going on—the federal debt; the reaction of financial markets; and what I mentioned yesterday among my contacts, that they're just nervous about the duration of the expansion—that those things will temper the economy in a way that we have to pay attention to because we may not need to do as much as if we were simply acting alone.

So with these questions in mind, I will continue to monitor the incoming data closely. However, in view of the strength of the economy and on-target inflation, I have a high bar for movements that would change my mind about the need for a December rate increase. Thank you.

CHAIRMAN POWELL. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Mr. Chairman. I agree with alternative B as written. Although I probably, in my remarks, will echo President Daly and President Harker, as I'm a little more uncertain about the outlook than I was even six months ago.

I do believe we should be gradually and patiently moving toward a neutral stance on monetary policy, understanding that there's uncertainty about where neutral is and there's uncertainty about the pace at which we should be getting there. I'm open-minded, and I want to avoid being rigid or predetermined regarding the pace at which we move. I'm sensitive to the fact, and I believe, that at inflection points, data can manifest themselves with a lag. I'm also sensitive that monetary policy moves now will act with a lag, and that our tools in a downturn are likely to be asymmetrical.

I'm concerned that the economy is likely to look very different 6 to 12 months from now than it does today as fiscal stimulus wanes and the effect of our tightening takes hold. Furthermore, tariffs, worker shortages constraining growth, and other factors have the potential to exacerbate the issue. Also, can the United States continue to grow at strong rates when the rest of the world appears to be decelerating? I further see profit growth, as I said earlier, materially slowing in 2019, and I'm cognizant of the fact that the U.S. economy is much more interest rate sensitive than it was in the past, due to high levels of corporate debt as well as record levels of government debt.

I think the FOMC has appropriately taken deliberate action over the past number of months, moving in December, moving in March, moving in June, and moving in September. However, I believe, at this point, the easier moves are behind us. I believe that between now and our next meeting, I'll be debating with my team the trajectory of the U.S. economy and the appropriate pace for further removal of accommodation.

I do believe—and I agree with some of the comments—that at a minimum, assuming we move in December, we should emphasize in our narrative not only that we're data dependent, but also that we will avoid being rigid or predetermined regarding the future pace of removal of accommodation. I also think it will probably be necessary in the press conference to make some further comments about the context and how we use the SEP and to emphasize that while it's an estimate, it is subject to change. It also should not be viewed in a rigid manner, and we reserve the right to deviate from it. I'm also mindful that the pacing will be aided next year by the fact that we have eight press conference meetings, and that should give us further flexibility. Thank you, Mr. Chairman.

CHAIRMAN POWELL. Thank you. President George.

MS. GEORGE. Thank you, Mr. Chairman. I support alternative B today, with an eye toward another rate increase in December if the outlook holds. While I view policy as accommodative, we are closing in on a neutral stance. Tealbook B appropriately highlights the key communications challenge the Committee is likely to face in terms of the timing and language that would help us transition from using guidance in our postmeeting statement.

Certainly, with strong growth coinciding with a tight labor market, it makes sense that we remain alert to signs of inflationary pressures arising from an overheating economy. On the other hand, the current outlook for inflation is consistent with our price-stability mandate, and inflation expectations appear to be anchored. The economy is absorbing 200 basis points of tightening, and there is some indication of slowing in certain interest-sensitive sectors, as businesses and households adjust to the current interest rate environment, while risks to the outlook are noteworthy.

For me, these circumstances argue that we revisit our communication, as soon as our December meeting, that appropriately conveys less certainty going into 2019 and better positions us in the period ahead to take the appropriate actions needed to achieve our longer-run objectives. Thank you.

CHAIRMAN POWELL. Thank you. President Bostic.

MR. BOSTIC. Thank you, Mr. Chairman. I support the policy action in alternative B. As I noted in the economy go-round, the recent data have been more or less in line with my forecast. The economy is in a good position, with performance metrics currently at or very near our targets. So this tells me that our policy should not be stimulative. We are, in fact, on a path to remove stimulus, and I'm comfortable with this.

As I see it, there are two key policy considerations moving forward. First, what is the appropriate pacing for removing stimulus? I believe that the current pacing has served the Committee well. The economy has continued to grow robustly as we have reduced the degree of accommodation, and we have moved far from the lower bound on the policy rate. I see no imminent signs to suggest that there will be a change in this dynamic if we continue along this policy rate path, so I support doing just that.

I am and will be mindful of the fact that the positive tone among my contacts has tempered somewhat. In particular, they see some risk that growth could slow more rapidly than I have forecast in my outlook, and they note that consumers appear to be increasingly sensitive to higher rates. In their view, the psyche of the people is more fragile than the data might suggest.

Over the next six to nine months, we need to be mindful of how consumers are responding to the prevailing economic environment. For example, if tariffs move from 10 percent to 25 percent, the feedback received from my contacts suggests that there'll be a measurable increase in pricing that will likely affect demand. In that case, we might need to slow our pace for getting to neutral.

I recognize that there is uncertainty about where neutral is. But I share the view, expressed by many here, that we should be data dependent in making this judgment. And the right policy approach, in my view, was just described nicely by President Daly: Act, wait, watch, interpret, and then decide.

The second policy consideration is whether there is a need for an overshoot of neutral. At present, as President Barkin articulated, I don't feel the data have presented a strong case suggesting the need for an overshoot. I do not support signaling this at this point. That said, if the data or reports given by my network of leaders suggest overheating is imminent or at hand, I will support moving. I look forward, over the next few meetings, to engaging with the Committee as we wrestle with these possibilities.

As a final statement, I also agree with many of the colleagues here that we need to remove the forward guidance and let the statement just stand on its own. Thank you, Mr. Chair.

CHAIRMAN POWELL. Thank you. President Kashkari.

MR. KASHKARI. Thank you, Mr. Chairman. I support alternative A at this meeting. Inflation is basically at target and appears stable. Inflation expectations also appear stable. Employment growth shows little sign of slowing down. We've raised the federal funds rate eight times, and the rate is now close to neutral. Obviously, it's difficult to say how close.

So I'll make a case that now is a good time to pause our tightening cycle for three reasons. One is, I think we want to let the effects of past increases feed through, as the Chairman himself said, and see where we are. We're seeing evidence that the past increases are showing up exactly where we would expect them to—in residential investment, in autos, et cetera. The strong dollar is also depressing import prices. The broad dollar is up 7 percent since the start of the year. We've got declining stock prices and slowing nonresidential investment. In the presence of long and variable lags, to me, it makes sense to pause to see how much more slowdown is already in the pipeline.

Second, as I said earlier this morning, we want to see how much slack remains in the labor market. It continues to exceed expectations. This might be able to go on for a while longer.

And then, third, if we keep raising rates, we risk slowing the economy to a point at which it could tip into recession. As others have noted, soft landings are notoriously hard to achieve.

You know, it occurs to me, as we've been raising rates—and we're now close to neutral—I think the view has been that it hasn't been very costly to the economy to raise rates over the past couple of years. And that's because we don't see the cost, right? The job market has continued to be strong. But maybe the job market would have been stronger; maybe wage growth would have been higher. So it's hard to see the cost—hard for us and hard for the public. But if we go further, I think the cost will become very clear to the public and us. And, obviously, the cost to Main Street of us triggering a recession or increasing the likelihood of a recession would be very severe.

I also think it'd be very hard for us to explain to the public why. I mean, unless we're looking at inflation above target or inflation expectations above target, what are we going to point to, to justify our moving to a restrictive policy stance? When Volcker did it so famously in the late '70s and early '80s, inflation was the number one economic issue on the public's mind. Clearly, that's not the case now, so I worry that if we just stay on our path, we could end the expansion, and we'd have a heck of a time explaining why we did that.

So, in sum, pausing right now seems the prudent policy. If inflation expectations pick up, we'll see it, and then it'll be appropriate for us to respond. So I would, therefore, prefer alternative A.

Finally, to my "spirit brother," Governor Quarles, and my "spirit sister"—I'm going to adopt you, President Daly. I think it was President Reagan who had the famous quote that someone who agrees with you 80 percent of the time is your friend, not your 20 percent enemy. [Laughter] Thank you.

CHAIRMAN POWELL. Thank you. Vice Chair Williams.

VICE CHAIRMAN WILLIAMS. Thank you, Mr. Chairman. I support alternative B as written. The ongoing strong performance of the labor market in the context of price stability continues to argue in favor of a strategy of gradually raising the target funds rate to a level that I expect will be moderately above my assessment of its longer-run value. In this light, I judge that a 25 basis point hike at our next meeting will be warranted unless the economic outlook significantly changes.

I should mention that I also expect it will be appropriate at the next meeting to make a second 5 basis point technical adjustment to the spread between the interest rate on excess reserves and the top of the target range. On that topic, the funds rate has inched up to around 5 basis points below the top of the target range, and future movements in the funds rate relative to the target range are more likely upward than downward. Therefore, I think it will most likely be prudent to raise the IOER just 20 basis points in December, assuming that we raise the funds rate target range 25 basis points.

Assuming that we do raise the target funds rate in December, we will—I'm just going to say something that many people have already said—be drawing very close to estimates of the neutral rate, in particular my estimate of neutral, which is ½ percent in real terms. We'll also be only 100 basis points short of the median projection of the funds rate in 2020, according to the most recent SEP.

And I'm going to pick up on a theme that President Evans made. I mean, my remarks are very, very similar to what he's already said and others have said, too. Due to the inherent uncertainty in the outlook for the economy and policy, this situation suggests that at least I will be losing conviction over time in this language in paragraph 2 that predicts "further gradual increases"—plural—in the federal funds rate. So I do agree with others and the Chair that we should be considering our next step to a more purely data-dependent description of future policy in our future statements.

In that regard, the box in Tealbook B and Trevor's presentation do provide a very good description of how the Committee managed the exit from the "measured pace" period back in 2005 and '06 and '07. Although this is useful background for the current situation, I'd like to emphasize that the parallel is not exact. Back then, the Committee was on a preset course, dishing out 25 basis point rate hikes like clockwork. The problem was how to get off the escalator without falling down, and the progression of steps in the statement language the Committee undertook proved effective at achieving that goal.

I see the situation as different for many of the same reasons people have highlighted, so I'll just go through them very quickly. One is, we have proven ourselves to be data dependent in our actions since 2005. We had one increase in 2015, one increase in 2016, and three in 2017, and at least my view is, most likely, we'll have had a total of four this year. And this is a better place to be. It's a very different situation than in the period from 2004 to 2006 in terms of data dependence.

In addition, as many have pointed out, we now have four SEPs a year. We have the interest rate projections. We have the 2 percent inflation objective. And, importantly, the Chairman is going to give press conferences on a daily basis. I'm sorry [laughter]—

CHAIRMAN POWELL. Hourly basis. [Laughter]

VICE CHAIRMAN WILLIAMS. So I do think the problem that we're trying to solve is somewhat different, and I think a slightly different solution is called for.

In the period ahead, as we examine the options for adjustments to the statement language that can move us away from "further gradual increases"—a description that I think eventually won't be accurate—it will serve us well to work in reverse, and first ask: Where do we want to be at the end of this journey? That is, start with the question of how to design our statements to best convey our view on the economic outlook and our reaction function. Several years ago, Presidents Kocherlakota and Plosser and I made some efforts toward this goal, and I'm happy to dust off those old memos. But, more to the point, I know many on the Committee have been thinking hard about this issue. And, obviously, we have the work of the subcommittee on communications, which can help us on that journey.

So with this goal in sight, what's left are the tactical steps that we can take to bridge us from our current forward guidance to what I hope is a more purely data-dependent destination. And my own inclination is not to overengineer this transition, as was done in the "measured pace" exit, but rather move a few steps toward a clearly data-dependent language as soon as is appropriate. And I look forward to our discussions of these topics at our upcoming meetings. Thank you.

CHAIRMAN POWELL. Thank you. And thanks to everyone for your thoughts and comments. I hear much support for keeping the target range for the federal funds rate unchanged at this meeting and for releasing the policy statement in alternative B, along with its corresponding implementation note. So let me now ask Jim Clouse to make clear what we're going to be voting on and to read the roll.

MR. CLOUSE. Thank you, Mr. Chairman. The vote will be on the monetary policy statement as it appears on page 5 of Trevor's briefing materials, and the vote will also encompass the directive to the Desk as it appears in the implementation note shown on pages 7 and 8 of Trevor’s briefing materials.

Chairman Powell	Yes
Vice Chairman Williams	Yes
President Barkin	Yes
President Bostic	Yes
Governor Brainard	Yes
Governor Clarida	Yes
President Daly	Yes
President Mester	Yes
Governor Quarles	Yes

CHAIRMAN POWELL. Okay. Now we have two sets of related matters under the Board’s jurisdiction: corresponding interest rates on reserves and discount rates. So may I please have a motion from a Board member to take the proposed action with respect to the interest rates on reserves as set forth in the first paragraph associated with policy alternative B on the last page of Trevor’s briefing materials?

MR. CLARIDA. So moved.

CHAIRMAN POWELL. May I have a second?

MS. BRAINARD. Second.

CHAIRMAN POWELL. Without objection. Thank you. Now may I have a motion from a Board member to take the proposed actions with respect to the primary credit rate and the rates for secondary and seasonal credit as set forth in the second paragraph associated with policy alternative B on the last page of Trevor’s briefing materials?

MR. CLARIDA. So moved.

CHAIRMAN POWELL. May I have a second?

MS. BRAINARD. Second.

CHAIRMAN POWELL. Without objection, so ordered. The next item, the second-to-last item on the agenda, is an update on the work of the subcommittee on communications, and for that, I will turn it over to Governor Clarida.

MR. CLARIDA. Thank you very much, Mr. Chair. I'd like to offer some brief remarks on the discussions we've been having in the subcommittee on communications. To remind you, that committee is composed of Governor Brainard and Presidents Kaplan and Rosengren.

We met on October 10 via conference call and in person yesterday and have reached agreement on the following points. There's strong support in the subcommittee for the proposal that we undertake a monetary policy framework review in 2019—a strategic assessment of the package of our tools and strategy and communications that can best enable the Federal Reserve to meet its dual-mandate objectives of price stability, defined as 2 percent inflation, and maximum employment.

There's also support for the notion that this effort to assess our framework benefit from external engagement and input from a wide range of interested folks—academics, business leaders, financial market individuals, and other groups representing labor, housing, and other considerations. As part of external engagement and input, there's support for a System conference in the summer of 2019 that would feature outside speakers and panelists. We have a location and a date for the conference: The Chicago Fed will be hosting the conference on June 4 and 5, 2019. This turns out to be the only week in June or July that does not involve a conflict due to blackout periods, competing conferences in Europe, the Fourth of July holiday, and monetary policy testimony, so apologies in advance if there is another conflict. There's support that the efforts of the Board and the Reserve Banks in this process of our assessment seek out and basically build on existing efforts to get engagement from groups in the Reserve Districts and here.

And then, importantly, this would just be the first part of what we envision would be a year-long process. Indeed, one of you said to me in my office that it might take longer than a year—but at least a year in the sense that, in the second half of the year, somewhat like what we've done this year by looking at the operating framework and our existing tools, we'd be having discussions within the FOMC on the basis of what we've heard at the conference and elsewhere and also drawing on staff work on the way to think about the strategies that we have and our tools and, in particular, make sure that they're robust in the environments that we may be facing in coming years. And I think there's a feeling that, at this point, we're very close to, or at, our dual-mandate objectives. With a strong economy, this is a good time to be having this conversation, as opposed to perhaps in some indefinite future when we would have other considerations.

So, what would be the outcome of this? Obviously, that would be the decision for the Committee in our regular meetings next year. We might choose to refine our consensus statement that we issue every January and also, if we did so, would report in more detail in the *Monetary Policy Report* to the Congress.

I've spoken with many of you in my office or by phone. I will be available until 2:00 p.m. this afternoon, when I have another meeting. Or if that doesn't work, please feel free to call me. So with that, if there are any comments, we could discuss here or in my office. I sent this out last week as well, but I wanted to have a chance to brief you in person on this.

CHAIRMAN POWELL. Questions or comments for Governor Clarida? [No response] Thank you.

MR. CLARIDA. In addition, I'll also say that we'll be issuing a brief press release next week to essentially announce the existence of this assessment process, indicate that we'll be seeking external engagement, and give the dates of the conference.

CHAIRMAN POWELL. Thanks, Rich. I'm very excited and pleased about the progress on this. I think it's going to be a nice process that will stand us in good stead.

Before closing the meeting, I'd like to offer a few comments related to the second day of our meetings. First, as you know, this'll be the last FOMC meeting without a press conference, and, historically, there's been a reasonable amount of variation in when our meetings end on the second day. After this meeting, we'll try to have the meetings end around the same time as we have been finishing up, because they'll always have press conferences.

On a related note—and I know we've all discussed this in other forums—the period between our meeting's end and when the policy statement is released is a very sensitive time, and it's in all of our interest, I think, to continue to avoid contact with people outside the Fed during this sensitive time. And in light of that, I'd ask that none of us schedule meetings with people outside the Fed between the time our meeting concludes and when the statement is released. So, to help out with that, starting today, we're going to have a buffet lunch—hold the applause—as opposed to boxed lunches. [Laughter] You know, you can't turn this down. It'll be available in the anteroom after each meeting. So I would encourage you to stay, have a nice lunch, and take full advantage of the time you have with your colleagues here at the Board ahead of the policy announcement.

Now our final agenda item is to confirm that the next meeting will be December 18 and 19, and I welcome you to a nice lunch here. Thanks very much, everybody.

END OF MEETING