

**Meeting of the Federal Open Market Committee on
January 26–27, 2016**

A joint meeting of the Federal Open Market Committee and the Board of Governors was held in the offices of the Board of Governors of the Federal Reserve System in Washington, D.C., on Tuesday, January 26, 2016, at 12:00 p.m. and continued on Wednesday, January 27, 2016, at 9:00 a.m. Those present were the following:

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

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

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

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

Thomas A. Connors, Troy Davig, Michael P. Leahy, Jonathan P. McCarthy, Stephen A. Meyer, Ellis W. Tallman, and William Wascher, Associate Economists

Simon Potter, Manager, System Open Market Account

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

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

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

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

James A. Clouse and William R. Nelson, Deputy Directors, Division of Monetary Affairs, Board of Governors; Daniel M. Covitz, Deputy Director, Division of Research and Statistics, Board of Governors

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

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

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

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

Eric M. Engen, Senior Associate Director, Division of Research and Statistics, Board of Governors; Beth Anne Wilson, Senior Associate Director, Division of International Finance, Board of Governors

Michael T. Kiley, Senior Adviser, Division of Research and Statistics, and Senior Associate Director, Office of Financial Stability Policy and Research, Board of Governors

Ellen E. Meade and Joyce K. Zickler, Senior Advisers, Division of Monetary Affairs, Board of Governors; Jeremy B. Rudd, Senior Adviser, Division of Research and Statistics, Board of Governors

Gretchen C. Weinbach, Associate Director, Division of Monetary Affairs, Board of Governors

Min Wei, Deputy Associate Director, Division of Monetary Affairs, Board of Governors

Glenn Follette, Assistant Director, Division of Research and Statistics, Board of Governors

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

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

¹ Attended Wednesday session only.

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

Katie Ross,² Manager, Office of the Secretary, Board of Governors

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

Deepa Datta, Senior Economist, Division of International Finance, Board of Governors;
Jonathan E. Goldberg, Senior Economist, Division of Monetary Affairs, Board of
Governors

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

David Altig, Jeff Fuhrer, Glenn D. Rudebusch, and Daniel G. Sullivan, Executive Vice
Presidents, Federal Reserve Banks of Atlanta, Boston, San Francisco, and Chicago,
respectively

Samuel Schulhofer-Wohl, Senior Vice President, Federal Reserve Bank of Minneapolis

Todd E. Clark,³ Deborah L. Leonard, Keith Sill, and Mark A. Wynne, Vice Presidents,
Federal Reserve Banks of Cleveland, New York, Philadelphia, and Dallas, respectively

William Dupor, Assistant Vice President, Federal Reserve Bank of St. Louis

Robert L. Hetzel, Senior Economist, Federal Reserve Bank of Richmond

² Attended Tuesday session only.

³ Attended the discussion of potential enhancements to the Summary of Economic Projections.

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January 26 Session

CHAIR YELLEN. Good afternoon, everyone. I know that many of you have had to deal with pretty challenging travel conditions to get here, so I want to express my appreciation for your willingness to brave the snow and ice to participate in today's meeting. Before we get started, I want to discuss one housekeeping detail that pertains to dinner this evening. Normally, we would have a dinner after the FOMC meeting. And it's not impossible for us to do it tonight: The Board staff is prepared to provide dinner. However, almost all of the people who live in town here face quite challenging conditions in terms of getting home. It is also forecast to rain this afternoon and maybe freeze over. And so I am, frankly, concerned about people staying late and dealing with those conditions. So would it be acceptable to people to make your own arrangements for dinner and cancel this evening?

PARTICIPANTS. Yes.

CHAIR YELLEN. Thank you. Okay. So we will consider dinner to be canceled.

MR. WILLIAMS. Will there be a sufficient supply of doughnuts during the break?

[Laughter]

CHAIR YELLEN. Well, we gave you a good lunch. [Laughter]

MR. WILLIAMS. Tomorrow morning, tomorrow morning.

CHAIR YELLEN. You should have confidence and trust your colleagues to do the best they possibly can on that score.

Okay. Importantly, I would like to welcome Neel Kashkari to his first FOMC meeting. Neel became president of the Federal Reserve Bank of Minneapolis at the turn of this year. President Kashkari brings valuable government-sector experience, including service as senior

advisor to the Secretary of the Treasury and assistant secretary of the Treasury during the global financial crisis. In addition, he has extensive experience in the private financial sector, and going back before that, he was employed as an aerospace engineer, contributing to what we affectionately call the “real side” of the economy. So, Neel, we look forward to working with you. And I would also like to welcome back onto the Committee Presidents Bullard, George, Mester, and Rosengren.

Now, as usual, this entire FOMC meeting will be considered a joint meeting with the Board of Governors. So I need a motion to close the Board meeting.

MR. FISCHER. So moved.

CHAIR YELLEN. Thank you. Without objection. Now, let’s begin with the organizational portion of the meeting, and, following well-worn precedent, I will turn the floor over to Governor Fischer, who will handle the nominations and elections for the positions of Chair and Vice Chair of the Committee.

MR. FISCHER. Thank you, Madam—Chair. I’m not sure—[laughter].

CHAIR YELLEN. Well, we’ll see.

MR. FISCHER. Thank you.

CHAIR YELLEN. “Madam” seems just fine.

MR. FISCHER. Thank you, madam. I’ll be calling for two sets of nominations and votes, and the first is, I’d like to ask for a nomination for Committee Chair.

MR. TARULLO. I will nominate Janet Yellen.

MR. FISCHER. Is there a second?

MR. POWELL. I second that nomination.

MR. FISCHER. Any other nominations or discussion? [No response] Without objection. Now I'd like to ask for a nomination for the position of Committee Vice Chair.

MR. TARULLO. I will nominate William C. Dudley.

MR. FISCHER. Is there a second?

MR. POWELL. I second that nomination, too.

MR. FISCHER. Any other nominations or discussion? [No response] Without objection.

CHAIR YELLEN. Thank you, Governor Fischer. Next, we're going to turn to the election of staff officers. Brian, can I ask you to read the list of nominated staff members?

MR. MADIGAN. Certainly. For Secretary, Brian Madigan; Deputy Secretary, Matthew Luecke; Assistant Secretaries, David Skidmore and Michelle Smith; General Counsel, Scott Alvarez; Deputy General Counsel, Thomas Baxter; Assistant General Counsel, Richard Ashton; Economists, Steven Kamin, Thomas Laubach, and David Wilcox; Associate Economists from the Board, Thomas Connors, Michael Leahy, David Lebow, Stephen Meyer, and William Wascher; and Associate Economists from the Banks, James McAndrews, Ellis Tallman, Geoffrey Tootell, Christopher Waller, and Troy Davig.

CHAIR YELLEN. Do I have a motion to approve these nominations?

MR. FISCHER. So moved.

CHAIR YELLEN. Okay. Without objection. And now we're ready to move on to item 2. We need to select a Federal Reserve Bank to execute transactions for the System Open Market Account, and the floor is open for nominations. Did I see President Bullard?

MR. BULLARD. Yes. I'll nominate the Federal Reserve Bank of New York.

CHAIR YELLEN. And are there further nominations or discussion? [No response]

Okay. Thank you very much. I need a motion to approve.

MR. FISCHER. So moved.

CHAIR YELLEN. Thank you. Without objection. Next we're up to item 3, to select a manager and deputy manager of the System Open Market Account. I'd like to ask Vice Chairman Dudley to make these nominations.

VICE CHAIRMAN DUDLEY. I'd like to nominate Simon Potter as Manager of the System Open Market Account and Lorie Logan as Deputy Manager of the System Open Market Account.

CHAIR YELLEN. Do I have a motion?

MR. FISCHER. So moved.

CHAIR YELLEN. Thank you. Without objection. Now we're going to move on to item 4, which concerns authorization for domestic open market operations and foreign currency operations, and I'd like to ask Simon to introduce this item.

MR. POTTER. I was having problems saying "Thank you, Madam Chair" at the start of this, which I've gotten through.

CHAIR YELLEN. Well done.

MR. POTTER.¹ As part of the annual review of the Committee's authorization for domestic open market operations, and as discussed in the memo titled "Request for Votes on the Authorization for Desk Operations" that you received before the meeting, the Desk recommends approval, with one minor change to ensure consistency in the use of terms "repo" and "reverse repo" transactions. That would be on page 44 of the organizational document.

¹ The materials for annual organizational items are appended to this transcript (appendix 1).

I'd also like to highlight another item for the Committee's consideration. In January 2009, the Committee suspended the Guidelines for the Conduct of System Open Market Operations in Federal-Agency Issues in light of the Federal Reserve's having begun a program of purchases of agency debt and agency mortgage-backed securities. The SOMA contains a significant amount of agency debt and agency MBS, and it continues to conduct transactions in agency MBS as part of the reinvestment policy adopted by the Committee. That being the case, I recommend the continued suspension of these guidelines. No Committee vote is needed to continue the suspension.

CHAIR YELLEN. Are there questions for Simon? [No response] Hearing none, we need a motion to approve the proposals.

MR. FISCHER. So moved.

VICE CHAIRMAN DUDLEY. Second.

CHAIR YELLEN. Without objection. Okay. We're now ready to move on to item 5, "Proposed Revisions to the Program for Security of FOMC Information."

MR. POTTER. Excuse me. Can we do the foreign authorization?

CHAIR YELLEN. Oh, I'm sorry. I apologize.

MR. POTTER. We also recommend that the Committee approve the documents governing foreign transactions without amendment. As I mentioned at the December FOMC meeting, the staff is evaluating the current foreign exchange reserve management framework and working on modernizing the documents related to foreign operations. I plan to defer recommending any changes to the documents governing foreign operations until these projects are complete. Note that the approval of the "foreign" documents includes approval of the

System’s warehousing agreement with the Treasury. As has been the case since February 5, 1997, the limit on warehousing is set at \$5 billion. There are currently no outstanding balances.

CHAIR YELLEN. Are there questions for Simon on the foreign currency matters?

Comments? [No response] Then we need a motion to approve that proposal.

MR. FISCHER. So moved.

VICE CHAIRMAN DUDLEY. Second.

CHAIR YELLEN. Okay. Thank you. Without objection. Now, item 5—I’d like to turn to “Proposed Revisions to the Program for Security of FOMC Information.” The staff is proposing three sets of relatively minor changes to the program. The first is to clarify that all Federal Reserve persons—and that includes FOMC participants as well as staff members—must receive, review, and agree to abide by the program. Second, there are some proposed changes to provide more flexibility in making FOMC information access decisions for persons at the Board. And, third, there are some technical changes, such as making program language more consistent and correcting a typo.

There is also a slightly more substantive change that I would like to propose, and I sent you a memo on this. As you know, our program for security of FOMC information has received some attention from the Congress and others as a consequence of the 2012 leak of FOMC information. Protecting confidential FOMC information is clearly a matter of the utmost importance, and it’s appropriate that we continually review our program to ensure that our policies and practices remain strong and transparent. The proposed changes to section 7 of the program are intended to clarify our procedures in the event of a potential breach of confidential FOMC information. To date, our program has stated that, once notified of a potential breach, the Committee’s secretary and general counsel will perform a review of the incident and, in light of

the review results, the general counsel will determine whether to request the Board's inspector general to perform an investigation of the incident.

Now, during my tenure as Chair, all potential material breaches have been referred to the inspector general, with only minimal review by the secretary and general counsel. I believe that that approach is fully consistent with the program, and the proposed revisions are meant to codify this practice. In addition, the revised language states that the secretary or the general counsel will make a referral to the inspector general, thereby vesting that responsibility in more than one person and reducing the possibility of any apparent conflict of interest in making a referral determination.

So I would like to propose those changes. And, before we go to a vote, let me ask whether there are any comments or questions on that proposal or other changes to the organizational documents proposed by the staff. President George.

MS. GEORGE. Madam Chair, I support what you've proposed here, but I noted in the strikeouts that the previous version, at some level, offered consultation with the president of the relevant Reserve Bank in the event of a breach. And if the breach emanated from a Reserve Bank, I just wondered, as a practical matter, even though you're striking through that in favor of this stronger process, whether there would be such consultation.

CHAIR YELLEN. I think there could be such consultation. I do think our default response should be that any material breach will be referred to the inspector general.

MS. GEORGE. I agree.

CHAIR YELLEN. That should be the default. It shouldn't be a specific judgment that we're making once something has been determined to be material. It should be turned over to the IG.

There could certainly continue to be consultation. But I do think it's important to make clear that our policy will be to turn any material matter over to the IG.

MS. GEORGE. And I support that. I'm thinking, as a practical matter, with employment and code of conduct issues within the Banks, we would have some follow-up if it involves the staff in a Reserve Bank as well.

CHAIR YELLEN. Other questions or comments? [No response] Okay. Then I guess we need just one motion to approve the organizational document.

MR. MADIGAN. I would vote on this program explicitly.

CHAIR YELLEN. Okay. We'll vote explicitly on the changes to "The Program for Security of FOMC Information." Do I have a motion?

MR. FISCHER. So moved.

CHAIR YELLEN. Without objection. Thank you very much. Our next agenda item, is "Proposed Change to the Statement on Longer-Run Goals and Monetary Policy Strategy." Before I turn things over to Governor Fischer, I would like to extend my thanks to the subcommittee on communications and to the staff who have supported their work on this topic. I think they are proposing potential enhancements to what is a very important document of this Committee. So let me turn things over to Governor Fischer to introduce this topic.

MR. FISCHER. Thank you, Madam Chair. At the October 2014 FOMC meeting, we discussed the possibility of amending the Statement on Longer-Run Goals and Monetary Policy Strategy, which is shortened to the "consensus statement," in order to clarify that the Committee's inflation objective is symmetric. At that time, there was widespread agreement that inflation moderately above the Committee's 2 percent goal and inflation the same amount below that level were equally costly. Although many participants thought that the symmetry of the

objective was understood by the public, it nonetheless seemed useful to clarify that symmetry in the consensus statement. However, some members thought that making a change to the consensus statement at that time posed a risk that the change could be seen as signaling a change in the Committee's views about the appropriate timing of liftoff. In order to avoid such confusion, the change was deferred until after liftoff. With liftoff now behind us, the Committee thought that this would be an appropriate time to make the modification. To do so, we have worked with all of you to develop specific language, which is shown in blue ink on page 4 of the handout, that has received broad support.

The modified wording makes clear that a sequence of one-sided misses of the 2 percent target in either direction would be undesirable. Even if inflation was ultimately expected to return to target, persistent misses would represent a welfare loss and might cause inflation expectations to become unanchored over time. Regarding the specific wording, we use the words “were running” in order to be clear that the deviations are ongoing. That is, they are not simply “bygones” but are expected to continue, at least for a time. I think this wording is appropriate because expected future deviations would be a greater concern if they followed a sequence of past deviations in the same direction, as the expected deviations would be more likely to have an effect on longer-term inflation expectations.

That said, the word “concerned” was chosen because it provides flexibility regarding whether the Committee would take action in response to the deviations. It might do so, of course, but a policy response would not necessarily be called for. For example, if inflation was running above 2 percent but unemployment was above the level consistent with maximum employment, then the Committee might judge that no change in policy was appropriate. Similarly, if inflation was running below 2 percent but the economy was strengthening and

inflation was expected to return to 2 percent over the medium term, then the Committee also might see unchanged policy as appropriate.

As we noted in the memo, we have also updated the reference to the SEP estimates of the longer-run normal unemployment rate. In doing so, we changed the reference from the central tendency to the median, a change consistent with the outcome of the Committee's discussion last July.

In view of the timing of the Chair's monetary policy testimony, we plan to release the updated statement following our meeting tomorrow along with the usual postmeeting statement. A draft of the short cover note that would be used for that press release is on page 5 of 5 of the memo from the subcommittee to the FOMC. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. We now have an opportunity for comments on the consensus statement. Let me start with President Williams.

MR. WILLIAMS. Thank you, Madam Chair. Governor Fischer has explained the process that we went through in the subcommittee on this as well as the reasons for the change, and I strongly support the change in the language. I just want to add one particular comment that I think is relevant for thinking about what we are trying to accomplish here. This part of the consensus statement is really just about our longer-run inflation objective. It doesn't shed light on what the policy responses are to deviations from the objective, or to the shape of the objective beyond the fact that it is a symmetric objective. I think one of the great achievements of the consensus statement over the years is that it has provided the biggest umbrella we are able to provide with regard to what we agree on—the 2 percent objective, and the view that this is symmetric—and leaves off of the consensus statement the particulars of how one thinks about the appropriate policy response and other things that we may have different views on. I think the

goal here, really, is just to cement in the public's mind that the goal is 2 percent, that it is the midpoint of the target, and that it is symmetric around that. And the rest of the statement, which stays basically the same as before, describes our policy strategy on deviations from that objective and doesn't indicate specifically what we do in those circumstances but lays out a general strategy.

So, again, I strongly support the statement. I think it is something that will help clarify our thinking for those who may still think that our 2 percent objective is somehow a ceiling and not a point target. Thank you.

CHAIR YELLEN. Thank you very much. President Mester.

MS. MESTER. Thank you, Madam Chair. The FOMC Statement on Longer-Run Goals and Monetary Policy Strategy was first introduced in January 2012. It serves to clarify the Committee's decisionmaking framework, and I do view the statement as an important addition to our communications arsenal. It is known internally as the consensus statement. That is not a misnomer. The statement has had very broad support among FOMC participants since its adoption. Of course, it wasn't by accident that that happened. The previous communications subcommittee and its chair, Janet Yellen, worked diligently to devise language that would encompass the diversity of views among participants while at the same time articulate to the public the Committee's approach to policymaking.

Due to the quasi-constitutional nature of the document and the fact that it has had very broad support, participants have generally agreed that the bar should be fairly high for making any changes. At the same time, the Committee has periodically considered amendments that could help clarify the document or make it a more effective communications device. And one of those changes, which is on the table today—the clarification that the Committee views a

2 percent inflation objective as symmetric—has received widespread support at previous meetings and, as Governor Fischer said, with the thought that the change would wait until after normalization had begun.

Consistent with those past discussions, I strongly support making the change now. The change has been signaled with the minutes of earlier meetings. And, now that liftoff has occurred, it sounds like the right time to do it. Moreover, January is the normal time for reaffirming the consensus statement. So I am not concerned that the change will be interpreted as a comment or signal about current monetary policy. And we can contain that interpretation by what we say about the change after it is released, explaining that the purpose is to clarify the framework in the interest of furthering transparency.

In terms of the specific language, I can tell you that the communications subcommittee and staff, under the able leadership of our chair, Stan Fischer, took a page out of the previous subcommittee's book and strove to craft language that would represent the broad consensus. We did engage in deliberations and consultations, and we took the comments and suggestions of each FOMC participant very seriously. Our deliberations suggest that the language now on the table is acceptable to almost all participants, and I want to acknowledge the willingness of many Committee members to compromise on their favorite phraseology in the spirit of reaching a workable consensus in the pursuit of our common goal of clarifying to the public this aspect of our policymaking framework.

With regard to the specific wording, the broad intent is to clarify that the Committee views the 2 percent inflation objective as symmetric. As Governor Fischer said, the phrase “were running” captures the idea that the primary concern is with deviations from target that are expected to persist into the future. It allows for different preferred models of the inflation

progress among participants. Some might put more weight on current and past deviations from the target as informative about future inflation. Others who view inflation expectations as a predominant factor when forecasting inflation might look at persistent deviations as a potential risk for unanchoring expectations.

As was said earlier, the word “concerned” is consistent with the Committee’s past behavior. Concern about persistent deviations doesn’t mean that they necessarily warrant Committee action. For example, I am concerned by the low level of inflation, but, on the basis of the outlook, I think a reasonable forecast is that inflation will return to target over the medium term, and I don’t believe additional policy accommodation is called for. A look at the minutes of the FOMC meetings in late 2006 and early 2007, when core inflation was above 2 percent, shows that the Committee was indeed concerned about elevated core inflation but held the funds rate target at 5¼ percent because it expected inflation to move lower over time.

The proposed wording clarifies the nature of the inflation target. How policymakers approach setting policy in order to promote achieving the symmetric inflation goal and our other dual-mandate goal of maximum employment is discussed later in the consensus statement. I don’t feel that the proposed wording constrains or changes in any way the ability of the Committee to chart the appropriate course of policy in pursuit of our goals. Again, we might all think of alternative wordings that we might individually prefer in one way or the other. But this statement is meant to be a consensus statement giving the Committee’s policymaking principles, and the specific wording proposed has been developed with that in mind. In supporting this change, I feel comfortable that I can explain my own approach to monetary policymaking within the context of this statement. I hope that others will approach it in this way, too, and I hope that they will support it as well. Thank you.

CHAIR YELLEN. Thank you very much. Governor Powell.

MR. POWELL. Thank you, Madam Chair, and let me briefly, offer the basis for my support for this change. I support it for three reasons. First, the change is an important, even fundamental, one in the sense that it rises to the level of inclusion in the consensus statement. The question of whether the 2 percent medium-term objective is a ceiling or a goal, with a symmetric loss function focused on it, is a critical one, particularly today—when inflation has undershot the target since the crisis, including almost every single month of my four years here at the Board. Second, as the meeting that Governor Fischer referred to earlier showed, Committee participants have broadly agreed that the loss function is symmetric. And, third, the proposed language, as Loretta indicated, has been the result of extensive consultation and now attracts the support of nearly all. And for those reasons, I am happy to support the language. Thank you, Madam Chair.

CHAIR YELLEN. Thank you very much. Governor Tarullo.

MR. TARULLO. Thank you, Madam Chair. As some of you have probably noticed, I have abstained from voting on this statement since it was introduced in January 2012 in part, as I have stated for the record in each of the past four years, on the ground that it really didn't communicate much that gave useful insight into how the FOMC would approach its policy decisions. In part, though, I abstained because certain expectations I had been given regarding language that would be included in the original statement were confounded at that time. Experience over those four years hasn't really changed my mind as to how useful the statement is in communicating how we go about making our policy decisions. As I anticipated at the time, in actual decisionmaking, everybody pretty much, I think, takes his or her own reading or interpretation of the statement.

However, it is not a bad thing to have even a high-level expression of consensus as to the FOMC's longer-range goals, and there does come a point when it is probably not too productive to continue to abstain. This seems to me such a point, particularly in light of the helpful changes that Chair Yellen, Governors Fischer and Powell, and Presidents Mester and Williams have worked out. And although this change is not directed at the issue that was in play back in late 2011, I think it is noteworthy, in light of recent experience and current circumstances. So I will vote for the statement today.

I now want to add one thought, though. We don't have a lot of expressions of agreement on the Committee. The statement expresses, albeit at a very high level, an agreement, despite some nontrivial differences that lie beneath it. President Williams, captured this well in his introductory remarks. I think it is institutionally important for us to project an ability to agree, even if only at a fairly high level, and that is why I abstained rather than dissented over each of the past several years. And that is why I have gone out of my way in the past four years not to highlight publicly my points of difference with the statement.

I also appreciate the fact that so far as I am aware, none of you has tried to argue publicly that the statement compels or justifies a particular policy outcome. There is plenty of room to interpret the statement in a variety of ways, as we have de facto done in our policymaking. And I suspect many of you, like me, would be happier if it were drafted somewhat differently. Indeed, I am not sure the language being added is exactly the way I would have phrased the point. The problem, of course, is that we would differ on what those differences should be. I think we should recognize the compromises that are inevitable, salute the work the subcommittee has done, endorse the statement, and then refrain from trying to highlight the differences rather than the admittedly high level of agreement. Thank you, Madam Chair.

CHAIR YELLEN. Thank you very much. President Bullard.

MR. BULLARD. Thank you, Madam Chair. I'm opposed to this portion of the changes to the Statement of Longer-Run Goals and Monetary Policy Strategy. My opposition centers on the extra sentence being added to the statement, which reads, "The Committee would be concerned if inflation were running persistently above or below this objective." In my view, this sentence is inappropriately backward looking. A basic tenet of modern inflation targeting is that it is the inflation forecast that is critically important, not recent misses of inflation from target that were caused by unpredictable shocks that hit the economy. Because this is a statement of longer-run goals, this sentence should appropriately reflect this basic tenet of inflation targeting. A rewrite that would accomplish this would be simple: "The Committee would be concerned if inflation were expected to run persistently above or below this objective."

I communicated my concerns to the communications subcommittee, but I was unable to persuade the subcommittee to change the language. Because I regard this as a matter of fundamental importance for this Committee, I'm dissenting on the adoption of this statement as written. Part of my concern is that this statement of longer-run goals is quasi-constitutional in nature and that language introduced today will likely be very persistent into the future. I therefore think that it is even more important to get this language correct than it is for other Committee statements.

I want to now point out three areas in which I see this new sentence as inconsistent with Committee statements and actual practice. One is in the staff's characterizations of optimal monetary policy. A second is in the current Committee communication regarding the inflation outlook and future policy decisions. And the third is in past Committee behavior during an era in which inflation was persistently higher than desired.

Let me begin with the staff's characterizations of optimal monetary policy. The current version of Tealbook B, page 8, provides the Committee with results of an optimal control exercise that projects inflation through 2021. The optimal control projections for inflation are below our 2 percent target until 2020; in addition, actual inflation has been below target for several years in the past. Yet, at least under the assumptions behind the optimal control exercise, this is the very best policy that can be pursued by this Committee. If the Committee adopted this approach to policy, then it would not be particularly concerned that inflation had been below target in the past. That outcome would be chalked up to shocks that hit the economy in the past, and the Committee would take the effects of those shocks on board and map out a strategy to move inflation back to target over several years. To me, this type of optimal policy calculation lays out a dichotomy compared with the backward-looking sentence being proposed for the statement of longer-run goals.

Let me now turn to the current Committee communication. The Committee's official statements on monetary policy in recent quarters have stressed the idea that the Committee needs to be reasonably confident that inflation will return to target over the forecast horizon. This is a forward-looking criterion that I think contrasts with the backward-looking sentence being proposed for the statement of longer-run goals.

Finally, let me turn to the past behavior of the Committee. During the period from 2003 to 2008, inflation routinely ran in excess of 2 percent. Naturally, the Committee and the Chair at the time were constantly asked about this situation. My general characterization of the response is that the Committee stressed that the factors that were keeping inflation relatively high were likely temporary, and that, under the policy in place at the time, the Committee expected inflation to return to lower, more normal levels. Again, this was a forward-looking argument. In

the event, inflation did not continue to rise but instead moved lower, and an era of inflation misses on the high side ended. This historical experience suggests to me behavior of the Committee that would be difficult to reconcile with the new sentence being proposed for the statement of longer-run goals.

In summary, putting the new sentence in the statement of longer-run goals this way will, in my opinion, put a burden on the Committee's future communication as financial market participants seek to reconcile the new language with the reality that it must be the inflation forecast that really matters for the future direction of monetary policy.

Let me stress before concluding that I support the remainder of the statement as written. As many of you know, I worked closely with many of my colleagues on the Committee to help craft this statement during 2011 for adoption in January 2012. This established an official inflation target for the United States, a longtime goal of former Chairman Bernanke. I still very much support that goal as well as the statement other than the new sentence. In particular, I support the addition of the word "symmetric," because I have always felt that misses on either side of the inflation target are equally important. My qualms today are solely about preserving the forward-looking nature of inflation targeting in the United States. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. I support the statement on longer-run goals and thank the subcommittee for providing language that clarifies that our inflation goal is symmetric. I'd like to believe that a symmetric goal was generally understood by the public, but there have been occasions when questions were raised about the Committee's commitment to a symmetric goal, and this language removes any ambiguity.

Our original longer-run goals document was adopted in 2012. We have made only modest changes to that language, mostly of a clarifying nature. I think it would be useful next year, and subsequently every five years, to conduct a more comprehensive review of the longer-run goals. As President Mester discussed, the original document was a compromise to obtain agreement among participants on the Committee in 2012. We chose to focus on the PCE rather than the CPI measure of inflation; to express the goal in terms of total, not core, inflation; and to adopt a 2 percent inflation target. Over the past five years, we have generally undershot our inflation target while being stuck at the lower bound. My view is that we should at least more fully consider the possibility that a 2 percent inflation target may unduly constrain monetary policy, especially in a world with low equilibrium real interest rates. It is clear to me that we have underestimated the cost of hitting, and the difficulties in leaving, the effective lower bound. We may very well not make any changes to what were in 2012 some difficult compromises, but I think a comprehensive review would be instructive even if we choose to make no substantive changes. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Evans.

MR. EVANS. Thank you, Madam Chair. I'd like to thank the communications subcommittee for their hard work in finding consensus. This is a welcome clarification of our price-stability objective. Even though many of us have said in public that we view 2 percent as a symmetric target, I think adding the idea explicitly to the Committee's formal statement of goals and strategy is an important communications tool to reinforce this concept with the public. The proposed language is succinct and clear in describing the sensible features of the symmetric objective. I strongly support the proposed addition. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Lacker.

MR. LACKER. Thank you, Madam Chair. I don't see a pressing need to modify the consensus statement, but I don't have strong objections to the changes being proposed. I would reiterate a point I've made in the past, which is that to serve the purpose of the statement in anchoring expectations regarding the conduct of monetary policy, the statement should not be frequently amended. It should be seen as a statement of timeless principles. I think somebody used the word "constitutional." I think that's right. In particular, we should avoid the appearance of opportunistic editing into driving policy expectations in one particular direction or another in the short run. My limited enthusiasm for this change stems in part from the extent to which this verges on appearing that way.

Another reason my enthusiasm is limited is that I don't know of an economic model in which our implied objective function is symmetric, mathematically speaking, without taking a linear quadratic approximation, which essentially imposes symmetry, or without imposing symmetry a priori on a loss function that a policymaker is posited to have, as opposed to having the objective function derived from the utility function of the agency model. Many of the reasons we view inflation above 2 percent as detrimental to the well-being of our country and our economy are distinct from the reasons we view inflation below 2 percent as detrimental to the economy, and there's good reason to believe that inflation dynamics could be different above and below 2 percent. So I'm not a big fan of the notion that our objectives are, strictly speaking, symmetric.

I can live with the statement, however. The sentence that's inserted, by itself, doesn't say our concerns are of equal magnitude on either side, and I prefer to think of the symmetry as a symmetry with respect to the sign of the concern on either side. But as I said, I have no objection to the changes being proposed.

CHAIR YELLEN. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Chair Yellen. I'm probably newer to this than just about anybody around the table, so I had a number of questions as we went through it. I agree and support the language in the statement. I do think it anchors expectations.

For me, as someone maybe coming at this with fresh eyes, it does appear forward looking because the statement overall is forward looking. I think the key word in the sentence that Jim was referring to is "concerned." It doesn't mean we feel the need to act. It means we'd be concerned. And I'll speak for myself—if inflation runs persistently below or above 2 percent, I am concerned, but that doesn't mean that I don't expect it to return to the 2 percent objective.

I think the statement adequately reflects my view. When I talked to Loretta about the timing of this, I had a question—maybe because I'm a little thinner-skinned as a new person here and sensitive to what's going on out there in the world on inflation—about whether this will be misinterpreted and taken to mean something other than what we intend. But I am convinced that this is simply clarifying and making more explicit what had been an implicit basic consensus around this table. So I support this language. Thank you.

CHAIR YELLEN. Thank you. President George.

MS. GEORGE. Thank you, Madam Chair. I, too, want to thank the subcommittee members and the staff for their work and for the inclusive manner in which they gathered input and considered various views. I, too, think this document has served us well and, as President Lacker noted, changes to it require careful consideration.

I support the changes to this statement but would offer a brief observation about the proposed clarification. The choice of an inflation target represents our best judgment for fulfilling a congressional mandate to achieve price stability. Such judgments necessitate not only

a view on symmetry, but also on the magnitude of deviations. My own view is that small deviations from 2 percent may not warrant concern even if they are persistent. For example, it's not clear to me that we should be terribly concerned if inflation were persistently 1.9 percent or 2.1 percent. Such judgments, of course, must be made in the context of the economy's performance and its outlook, as others have noted. Deviations from 2 percent are less of a concern if inflation is expected to move toward 2 percent over time and inflation expectations remain well anchored. Likewise, the cost of deviating from the 2 percent objective depends on what is happening with respect to employment and other economic conditions. Inflation below 2 percent might be less of a concern than inflation above, for example, if unemployment is at or below the natural rate and the economy is growing at a sustainable pace. Thank you.

CHAIR YELLEN. Thank you. President Kashkari.

MR. KASHKARI. Thank you, Madam Chair. I support the changes to the statement, and I support the statement itself. I have to say, though, that until I joined the Federal Reserve a few weeks ago, I always thought that 2 percent was a ceiling, not a target. I heard what members said, but when I looked at the actions over the past few years, it appeared to me to be a ceiling. I think that markets have short memories, maybe shorter memories than many people around this table, and I was guilty of that, too. And so I support putting this in. I think symmetry is sufficiently important to put in our constitutional document. I would just encourage us all that we probably have to work even harder to communicate to markets why our actions are consistent with symmetry, especially in the near term, when we may well have to be raising rates when inflation may well be lower than target, and it is going to raise questions. Thank you.

CHAIR YELLEN. Very good. Thank you. Governor Brainard.

MS. BRAINARD. Thank you, Madam Chair. I also support the change in our statement on longer-run goals, and I thank the subcommittee for their work on this. The modified language is very helpful—particularly at this time, when inflation expectations appear to be under some downward pressure—in clarifying that our inflation target is just that, not a ceiling but a target. I also like the language underscoring that the Committee would be concerned about persistent one-sided misses. Thank you.

CHAIR YELLEN. Thank you. Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you, Madam Chair. I support the revised statement. The statement makes it clear that our loss function is symmetric with regard to the 2 percent goal, not necessarily in every particular case, but on an *ex ante* basis. Thus, 2 percent is not a ceiling, but a target. Now, there is a more subtle question, that of how the statement will be read with respect to the so-called bygoness issue. Does “symmetric” mean we will want to make up for past shortfalls with offsetting or symmetric overruns? I don’t think the statement speaks directly to that, and I don’t read the statement that way. Symmetry to me is about the loss function, not a goal or a commitment to make up for past shortfalls.

My own view is that we continue to run a bygoness policy rather than a price-level targeting policy. We’re not deliberately seeking to push inflation above 2 percent to offset for the years that we spent below 2 percent, but at the same time, we might have to run above 2 percent for a time if that’s what is required to push inflation expectations back up to our 2 percent objective. And we would do that, of course, so we could better achieve our 2 percent objective over the longer run. There’s that little subtlety that the statement doesn’t get at, and I think it’s just useful to restate this in terms of our still continuing to follow a bygoness policy.

CHAIR YELLEN. Thank you very much. Let me add my own support for the proposed changes to the statement. I always viewed our inflation objective as symmetric and considered 2 percent to be our target and not a ceiling, and I think the new language makes this clear. As others have noted, it's also consistent with previous communications and serves as a meaningful clarification of the FOMC's views.

Now, I'd like to proceed, as we have in the past, to first take a straw poll of the views of the entire Committee so that the minutes can record the strength of support for the statement among all participants. But we will also need a formal vote by the members of the Committee to adopt the statement. So let me start with a straw poll, and I would ask any of the participants to raise your hand if you support the statement. [Show of hands] Anyone opposed? [Show of hands] Okay. One opposed. Now we're going to take a formal vote of the members to adopt the statement. So, members only, all in favor? [Chorus of ayes] And opposed? [One aye]

Okay. As Stan noted, we will release the revised Statement on Longer-Run Goals and Monetary Policy Strategy tomorrow at the same time as our policy statement. This marks a departure from our typical practice of releasing the statement with the minutes. An advantage of our typical approach is that the minutes can provide important context and rationale for any changes and thereby reduce the possibility that the revisions will be misinterpreted by the public. This year, though, my monetary policy testimony before the Congress will occur earlier than normal and before the release of the minutes for this meeting. Because the consensus statement appears in the *Monetary Policy Report* to the Congress, we need to accelerate its release. But I do want to warn everyone that this timing will pose some communications challenges, particularly in light of the fact that we have the dissent that will be reported tomorrow.

Some of you may want to discuss the consensus statement in public, or you may be asked about it by members of the press. So I just want to remind everybody that, as always, you are free to share your own views. But let me emphasize that you should not characterize the views of other participants or the Committee as a whole as reflected in this meeting's discussion or other confidential interactions, and that doing so would be a violation of our program for security of FOMC information and our policy on external communications. And on this particular topic, I do think that staying in line with our policies may prove to be quite tricky, as discussing your view could very naturally lead to contrasting your view with the views of others. So I mention this because I would like you to consider your communications on this topic very carefully.

With that, let's go on to our next item, item 7.

MR. EVANS. Madam Chair.

CHAIR YELLEN. President Evans.

MR. EVANS. I have a question. In listening to your commentary, that reminds me that normally, once the minutes are out, there's a paragraph or more that describe Committee discussions.

CHAIR YELLEN. Yes, there will be.

MR. EVANS. Yes, that's right, but part of the problem is, talking before the minutes come out means that you're laying yourself bare.

CHAIR YELLEN. Exactly. That's right. We will release this tomorrow. President Bullard will have a sentence to explain his dissent. When the blackout period ends, everybody's free to comment. Especially with the dissent, many of you may be asked, "Well, what's that about? What's your view?" and so forth. But the minutes won't be out. So it will be very

natural, I think, to say things like, “Well, the Committee really thought *X*. I agree with most people on the Committee. We think this means blah, blah, blah.”

MR. EVANS. So is it fair to say that after the minutes are out, it seems less likely that we’d be running afoul?

CHAIR YELLEN. Yes, I don’t think you’d be running afoul. You might say, “As the minutes explained, the Committee blah, blah, blah.” And that’s fine. It’s in this period before the minutes come out that I think we’re at risk. So I’m just highlighting that.

MR. EVANS. Good. Thank you.

CHAIR YELLEN. President Kaplan.

MR. KAPLAN. I’ll ask a question that I’m sure is out of order, but I will ask anyhow, and I’ll direct this maybe to President Bullard and the group. I take it that there’s been enough conversation back and forth by everyone else around the table indicating that we do mean this to be forward looking. That’s not enough to sway your thinking? I normally wouldn’t ask, but I just want to ask because it strikes me that this coming out with a dissent is going to be very confusing to people. I wouldn’t mind if we took a few extra minutes here, if you’re willing, to debate it or discuss it a little bit more. It might be healthy—unless that’s going too far and it’s already been done.

CHAIR YELLEN. I agree with you. But we have had some conversations about this. President Bullard?

MR. BULLARD. I think it’s done.

MR. KAPLAN. You do? Okay.

MR. BULLARD. You know, I do feel very strongly about this. I think it’s a constitutional document. I think we could have said that if inflation is expected to go back to

target, the Committee would be comfortable. I gave examples of when we've done that in the past. I gave examples taken from our own communications. So my concern is that what we're doing is setting up, inside a constitutional document, a challenge for future communication because I think, for instance, our rhetoric about being comfortable that inflation is going to return to target is going to be at odds with what's now in the longer-run statement, which says that we're uncomfortable if inflation has been below target persistently for a while.

So I'm trying to highlight this. I think what will happen is that, as you all have done here at the meeting, you'll talk a lot about how you're interpreting the phrase as forward looking, which is the way I think it needs to be interpreted.

CHAIR YELLEN. Governor Fischer.

MR. FISCHER. I'd just like to make two statements. One is that "were running" is not the same as "had run," and if the statement had said we would be concerned if inflation "had run" below 2 percent, then we would clearly be backward looking. We were trying to get in an element that said past, present, and future, and that was where "were running" came from. And as others have emphasized, and as I said in my opening statement, the fact that we are concerned does not imply a particular course of action, and so I applaud President Kaplan's initiative, and I would have been very happy if it had led to unanimity.

The second thing I'd like to say is that I'd like to thank the three other members of the communications subcommittee who spoke, in the order of John Williams, Loretta Mester, and Jay Powell. This was a fairly long and intensive process. I was sustained throughout by the opening remark by one of the members of the subcommittee: "You should know," she said [laughter], "that there is a body buried under every word in this statement." And I can testify that there are about 13 more bodies buried under there now. And, finally, I would like to thank

the members of the Committee, including Jim Bullard, for the fact that the discussion on how to modify this statement was conducted in a thoroughly collegial way. Thank you, Madam Chair.

CHAIR YELLEN. Thank you very much. Let's then move along to our next item, item 7, which is "Financial Developments and Open Market Operations," and I'd like to ask Simon to deliver the first part of the Desk briefing.

MR. POTTER.² Thank you, Madam Chair. I will begin by discussing global financial market developments and then Lorie will review money markets and operational matters.

As highlighted in the Desk's post-liftoff briefings, global financial markets were little changed in the two weeks following the December FOMC meeting. The calm in markets vanished at the turn of the year, and risk assets have had their worst January since 2009. Market participants generally point to three somewhat related factors underpinning the selloff: first, concerns over possible economic and financial instability in China; second, the continued declines in oil and other commodity prices; and, third, a change in the perception of support for risk assets from G-3 central banks.

The top-left panel of your first exhibit shows how significant the selloff in global risk assets has been. The S&P 500 declined 7 percent, equity indexes in other countries fell as much as 18 percent, and high-yield corporate credit spreads in the United States widened 90 basis points to a new post-crisis high of 750 basis points. While the widening in credit spreads was sharpest for energy-sector firms, ex-energy spreads widened by 77 basis points. Nellie will discuss the financial stability implications of the rise in spreads in her briefing.

The changes in asset prices and yields since the start of the year are remarkably similar to what followed the surprise renminbi devaluation in August of last year, as shown by the comparison of the two episodes in the top-right panel. Market participants viewed unpredictable and inconsistent management of the Chinese currency as a key factor behind both episodes, which renewed questions about the severity of the economic growth slowdown in China and the ability of Chinese authorities to successfully address it. In both instances, the market-implied federal funds rate path shifted lower as global equity prices and emerging market asset prices declined. Meanwhile, safe-haven currencies like the yen appreciated, and long-dated nominal Treasury yields declined, led by large declines in TIPS-implied breakeven rates.

As shown in the middle-left panel, the on- and offshore renminbi have depreciated against the U.S. dollar since the August 2015 devaluation. The

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

depreciation trajectory has been particularly volatile since the turn of the year, as Chinese officials appeared for a few days to have shifted their FX policy to target a trade-weighted renminbi basket as opposed to a dollar–renminbi exchange rate.

Both the surprise devaluation on August 11 and the erratic renminbi fixings at the start of 2016 have had the effect of depreciating the Chinese currency faster than some market participants had expected. That is increasing the demand to diversify from RMB-denominated assets into U.S. dollar–linked assets and the urgency of paying down U.S. dollar obligations. Chinese authorities have reacted by increasing capital controls, severely limiting liquidity in the offshore RMB market and ramping up intervention to restore stability in the RMB–dollar exchange rate. The volatility in the renminbi, the pace of depreciation since SDR inclusion was announced, and the recent spike in offshore interbank renminbi rates in Hong Kong have led many dealers to expect further depreciation to above 7 RMB per dollar this year. But perhaps more significantly, an increasing number of market participants are expecting a large, and potentially abrupt, depreciation in the RMB–dollar exchange rate in order to reset expectations and stem capital outflows.

Of course, Chinese authorities may want to avoid such an outcome and can instead attempt to push against depreciation expectations by intervening in foreign exchange markets and re-pegging to the U.S. dollar. As shown in the middle-right panel, official December reserve data showed a record monthly decline of \$108 billion, suggesting a historic pace of PBOC reserve sales to stem capital outflows and smooth the pace of currency depreciation. Many speculate that reserve sales have accelerated so far in 2016 as the PBOC apparently re-pegged to the dollar in the past week or so.

Developments in China, along with the persistent declines in oil prices that I will discuss in a moment, have intensified concerns about financial fragilities across the globe. Indeed, investors have begun to question the sustainability of two long-standing dollar pegs—the Hong Kong dollar and the Saudi riyal. The top section of the bottom-left panel shows that the Hong Kong dollar depreciated significantly over the intermeeting period. The bottom section of the panel shows an uptick in realized volatility in the Saudi riyal–U.S. dollar exchange rate. While contacts believe the likelihood that the Saudi or Hong Kong pegs will be adjusted or abandoned is low because of large central bank dollar reserves, market speculation over this is a new development, and, if either materialized, it could generate additional market spillovers.

Concerns about the potential for a rapid deceleration in Chinese demand, which Steve will discuss further in his briefing, contributed to significant declines in the prices of oil and other commodities over the intermeeting period. However, the balance between demand and supply factors continues to be a debated issue, with oil market participants generally focusing on additional supply coming on line from Iran as the key driver over the period. As shown in the bottom-right panel, the Bloomberg metals index has declined roughly 5 percent year-to-date, while the front-month Brent

crude futures contract has declined about 15 percent to \$30 per barrel; both measures fell below their crisis lows, the dashed lines.

The declines in commodity prices—in particular, in oil—had knock-on effects across markets. Commodity-linked currencies depreciated considerably, as shown in the top-left panel of your next exhibit. Their depreciation, along with the weakening renminbi, contributed to an appreciation of the trade-weighted dollar of nearly 2 percent since the start of the year, with many emerging market countries using FX intervention to smooth depreciation and maintain market functioning.

Meanwhile, global measures of inflation compensation, particularly in the euro area and United States, declined notably over the intermeeting period, as shown in the top-right panel. The U.S. five-year, five-year inflation swap rate—shown in light blue—is currently around 1.9 percent, while the euro-area inflation swap rate—the dark blue line—is at 1.6 percent, both only slightly above their 10-year lows. The Board staff’s measure of five-year, five-year inflation compensation derived from TIPS fell below 1.5 percent over the period.

A third factor underlying recent market turbulence, according to some market participants, is that the so-called G-3 central bank put, which, in their view, has provided support for global risk assets since the crisis, is now further out of the money. In addition to FOMC liftoff, these market participants point to the disappointment of the December ECB meeting and a belief that the BOJ might be at the feasible limit of monetary policy at the lower bound. However, market-implied policy rate paths in most of the developed world shifted lower over the period, shown in the middle-left panel. Late in the period, communications by ECB President Draghi served to increase expectations of further accommodation coming from the ECB and produced a rally in global risk assets.

With regard to near-term FOMC policy expectations, as shown in the middle-right panel, the implied probability of a 25-basis-point rate hike occurring by the March FOMC meeting has declined to roughly 1 in 4 from even odds at the beginning of the year. There is a very small probability placed on a January hike, and the market is pricing in only one increase to the target range over all of 2016, down from roughly two hikes at the start of the year.

Current market pricing of near-term policy is broadly consistent with the results of the Desk’s most recent surveys. Nearly all survey respondents assign a near-zero probability to an increase in the target range occurring at this meeting, and the average perceived probability of a rate increase at the March meeting is around 30 percent. In our surveys, we redesigned questions related to the path of the federal funds rate with the goal of better understanding the differences across survey modal and mean paths and market pricing.

The bottom-left panel presents more detailed information on the average probability respondents attach to different outcomes for the direction and timing of the Committee’s next policy rate action, along with the implied expectations for the

target rate at the end of 2016 conditional on these actions. As shown in the leftmost column, respondents on average attach a 72 percent probability to the Committee's next policy action this year being a rate increase, a 9 percent probability to the next action being a rate decrease, and a 19 percent probability to there being no change in the target range this year.

As shown in the rightmost column of the panel, conditional on the FOMC's next policy action in 2016 being an increase in the policy rate at the January or March meeting, respondents' average expectation for the target rate at year-end 2016 is 98 basis points. Conditional on the next action being a rate hike in April or later, the expectation for the year-end 2016 target rate is a little lower, at 90 basis points. Each of these outcomes is equivalent to approximately two further 25-basis-point rate hikes this year.

Taking into account the possibilities of the next move being a decrease in the policy rate or no change in 2016 produces an unconditional expectation for the year-end 2016 rate of 77 basis points—the first red dot in the bottom-right panel—only about 10 basis points above the market-implied rate. Note that this unconditional expectation is constructed by assuming the effective lower bound is 13 basis points, which ignores the views of the roughly 25 percent of survey respondents who now believe the lower bound for the target federal funds rate is below 0 to 25 basis points.

To measure policy rate expectations further out, we asked respondents to consider two conditioning events: no return to the lower bound over the next three years versus a return to the lower bound sometime over the next three years. These conditioning events were then used to elicit probability distributions regarding federal funds rates at the end of 2017 and 2018.

Respondents across the surveys assigned an average probability of 30 percent to a return to the effective lower bound at some point during the next three years. Conditional on *not* returning to the lower bound, the expected path was below the modal path in 2017 and 2018, suggesting that even in this scenario, market participants perceive downside risks to their modal federal funds rate forecasts. Combining these conditional expectations with the means associated with the scenario of a return to the effective lower bound gives the unconditional means shown by the red diamonds for 2017 and 2018 in the bottom-right panel. It is striking how close these unconditional means are to the market-implied path and how far they are from the modal path.

We also obtain economic forecasts and the probabilities of a U.S. recession and global recession given by the dealers. These forecasts and probabilities are broadly similar to the Board staff forecast and do not appear to justify, in a standard Taylor rule-type approach, the large gap between the modal and mean expected rate paths. Of course, a standard Taylor rule approach doesn't capture some of the most salient features of the current global situation: most advanced-economy central banks at or near the lower bound; the second-largest economy in the world going through a difficult economic transition while it haltingly tries to liberalize its financial markets;

unprecedented falls in commodity prices; and, finally, a large increase in the value of the global reserve currency. An alternative explanation is that markets are pricing in outcomes that forecasters don't expect; as you know, forecasters are notoriously bad at predicting recessions. In his briefing, Thomas will discuss the probability of a recession in the next six months implied by corporate credit markets using simple statistical models. We would be happy to take questions.

CHAIR YELLEN. Questions for Simon?

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

CHAIR YELLEN. Yes.

MR. FISCHER. What do you expect us to do with these facts?

MR. POTTER. I view our job as trying to report on what's happened in markets and the expectations that market participants have. One of the quandaries we had for some time was that there was quite a big difference between the market path and some of the expectations we were getting back from the people that we surveyed. So one of the things we did was, we tried to change our questions to give them events to think about. And that was to try to get at the notion we had had in our heads that some of the reasons that the market path looks different from the modal path or some of the other numbers we get back from them had something to do with the effective lower bound. And what we found by changing the questions is that it was much easier to reconcile the market pricing with the expectations regarding the federal funds rate path that market participants have, but it leaves a big gap to try to explain how their modal path and the economic forecast that they show could support those expectations regarding the federal funds rate. And, in my view, which I expressed, it's something more to do with the rest of the world. The other possibility is that markets have sensed a weakening that we can't see in the data, and that's in the financial market, and they're basically giving a signal that U.S. growth will be much weaker in the first half of the year.

MR. FISCHER. Okay. I'll stop there.

CHAIR YELLEN. You're welcome to continue.

MR. FISCHER. Well, yes. I think we all heard the earlier statement that more or less said that we'd better get on with the discussion.

CHAIR YELLEN. I see.

MR. FISCHER. So I'm doing this in that spirit.

CHAIR YELLEN. Okay. We certainly have time for a little bit more conversation. I did point out to people that we were starting late and so would need to be perhaps a little more concise than usual, but I did not mean to stifle discussion. So, please, if you want to follow up, continue.

MR. FISCHER. The concern I have is that as you draw them out, you're guiding them. I have a slightly uneasy feeling that we're getting these torrents of information about what the market participants believe, and we're not getting torrents about what the staff believes, although we have the very valuable Tealbooks to use. And I don't know whether it's healthy that we concentrate our briefings on what the markets are telling us rather than what we believe economic forces are pushing us to. That's not to ask you not to present this, but it's to ask whether the deeper and deeper and the more complicated questionnaires you're preparing are helping us do what we need to do in making our decisions.

MR. POTTER. Agreed. As you look at the data, this is just one point for you to look at, and you have a lot of other information you can bring to bear on your decisions. The only thing I'd say is, the history of markets forecasting these turning points is a little bit better than forecasters just looking at the backward-looking data that they have.

MR. FISCHER. Yes, well, you know, the famous Samuelson statement—but I was told by somebody in the Treasury that it's not that the markets forecast 9 of the past 5 recessions, it's that they forecast 20 of the past 8.

MR. POTTER. That is probably about right, and the staff forecast has done 0 of the past 9. [Laughter] So you can make a choice.

CHAIR YELLEN. President Bullard.

MR. BULLARD. Maybe just to clarify in my own mind some of the information that is in this exhibit 2, bottom-right panel, could one of the things that has been going on—obviously, I know you said this in different ways—be that because, internationally, central banks are experimenting with negative rates, market participants are looking out there, and they are really thinking, “Oh, if something bad happened, the Committee here would go negative, and, therefore, we are going to lower the whole expected policy rate path.” Is that what you are saying?

MR. POTTER. No. If you take out the 12 responses that have negative rates or push them to 13 basis points, you get an increase of 3 basis points in the 2017 and 2018 dots. So that is not what I am saying. The 30 percent probability of returning to the effective lower bound is not that different from the previous probability we had over two years. It is over three years. The thing I am trying to emphasize is that even if we take the expected path, which doesn't return to the lower bound, they still see downside risks relative to their modal forecast. And that's hard to understand. It could be the neutral rate. It could be these global forces and a lot of other things that are driving it. But it's data driven. I was surprised to see how much of what was a big gap we could reconcile by changing the questions. And they didn't get to see how their answers added up.

MR. BULLARD. Yes, okay.

CHAIR YELLEN. President Evans.

MR. EVANS. Thank you, Madam Chair. I admit I am still digesting the analysis you just gave us, but I do think it's very useful to have you try to explain what the market pricing is telling us. For example, here is a different one. On exhibit 2, the top right, you display the five-year, five-year inflation swap rates and how they have taken another leg down. And I think you mentioned that the Board of Governors' assessment of this is below 1½ percent. It is extremely low. Now, we've talked about this in the past, and I have been troubled by the fact that we kind of dismissed these movements, especially when they are associated with another leg down in the price of oil: Well, there is just a high correlation between oil going down and all the volatility, and so this is really something else about market functioning. But I don't know what we know about that. That's a story, but I wonder about it. And analysis like what you are talking about might shed light on whether markets actually believe that the FOMC is going to be unable to hit its 2 percent inflation objective in a world in which world demand is lower, oil supplies are higher, the price of energy is going down, prices of commodities are going down, and there is a lower equilibrium real interest rate. I think it is extremely useful for your team to provide some commentary, at least, as to how market participants are thinking about that. And I tend to think that these legs down are somewhat meaningful.

MR. POTTER. There's definitely evidence that, when risk assets decline, the correlation that breakeven inflation has with oil goes up. And, remember, it is hard for us to explain why inflation from 2020 to 2024 should be related to the oil price today. We don't have a good explanation for that. It is starting to feed on itself, though, because everyone has seen that. So the trades they are putting on are sort of based on that. And it is not just in the United States;

you see it in Europe and other parts of the world. We were doing 30-minute correlations through the trade index, and you can see them really moving up across asset classes. We don't have a good explanation for that, and it could be something to do with how these assets are traded in the short run. But if you look over a reasonable period of time, which is now six weeks, these are pretty large falls in risk assets as well as a large decline in the inflation compensation measures we have.

MR. EVANS. And, historically, we have looked to measures like this, for example when we were simply looking at long-term Treasury rates quite a long time ago and saying, "They moved up, it must be inflationary pressures." These are part of the toolbox that we keep pointing to, and dismissing the movements when they are inconvenient but then bringing them back later on when they are moving up. I think we need a better handle on that. And I rely on your analysis to help us with that. I appreciate that.

MR. POTTER. I think the Board staff has also done a lot of good work on it.

MR. EVANS. Yes. Thank you.

CHAIR YELLEN. Further questions? [No response] Okay. I think Lorie is going to continue now with the second part of the Desk briefing.

MS. LOGAN. Thank you, Madam Chair. I will begin with exhibit 3. Following the Committee's decision to increase the target for the federal funds rate, overnight rates moved smoothly into the new target range. As shown in the top-left panel, overnight secured and unsecured rates shifted up, and, with the exception of year-end, the effective federal funds rate printed between 35 and 38 basis points.

The dispersion of rates and volume of trading in overnight markets were similar to those pre-liftoff, suggesting that market participants did not materially alter their behavior in response to the new level of rates. As shown in the top-right panel, trading volumes in overnight markets were little changed following liftoff. Further, as shown in your middle-left panel, the distribution of rates on federal funds transactions shifted higher, as illustrated by the movement from the dark blue to the light blue line. Rates on triparty repo transactions, not shown, exhibited a similar shift though fell modestly lower within the target range than in the pre-liftoff period, in part reflecting the fact that the ON RRP rate increased by only 20 basis points.

Over year-end, the changes in money market rates were largely consistent with prior quarter-end dates, though the magnitude of the decline in the effective federal funds rate on the 31st was relatively large, printing below the target range at 20 basis points.

As you can see in the red line of the middle-left panel, roughly 70 percent of lending in federal funds—nearly all of which was done by the FHLBs—took place below the ON RRP rate, despite nearly all FHLBs having access to the ON RRP.

This lending was driven by two main factors: first, a preference for a relatively early-in-the-day return of investments, which can be achieved in the federal funds market but not in triparty repo, through which our ON RRP operations are conducted; and, second, reduced demand by foreign banks on year-end. This lower demand leaves FHLBs with a smaller set of counterparties to lend to for early return of investments on period-end dates. We saw a comparable amount of trading activity below the ON RRP offering rate on some quarter-ends during the testing period. FHLBs appeared willing to lend at rates further below the ON RRP rate this year-end though, perhaps reflecting the movement away from the effective lower bound.

Overall, however, the year-end decline in the effective federal funds rate was transitory, and the level of the effective rate and the distribution of federal funds activity normalized quickly. Of note, the volume-weighted median federal funds rate was 15 basis points on year-end, 5 basis points lower than the volume-weighted mean, as indicated by the arrows in the middle-right panel. Although the volume-weighted mean and median are virtually the same on most days, a greater dispersion on period-ends between the level at which a majority of trading volume occurs and the other trades can cause the median to fall below the mean.

This effect was apparent over the year-end and may have been amplified by movement away from the lower bound, suggesting that the effective rate may print further below the target range on future month- or quarter-ends once the calculation methodology is switched to the weighted median. As noted in the Desk's January 6 public statement, the staff plans to change the underlying data source and the calculation method for the effective federal funds rate to the volume-weighted median and begin publishing the new Overnight Bank Funding Rate on March 2.

As shown in the bottom-left panel, term money market rates shifted upward in the run-up to the December FOMC meeting, roughly coincident with the increase in market-implied probabilities regarding liftoff depicted in the dashed line, and in a manner consistent with previous tightening episodes. Of note, Treasury bill rates out to three months, shown in light blue, have largely traded below the ON RRP rate, reflecting strong demand for safe, liquid assets by a variety of investor types, most of whom do not have access to RRP's with the Federal Reserve.

With regard to our operations, ON RRP take-up on the day after the December meeting was little changed from the previous day, and thereafter the levels of private market rates and calendar effects appeared to influence take-up in a similar fashion as

before liftoff, as shown in the bottom-right panel. Dynamics at the counterparty level were also largely consistent with the pre-liftoff experience, with no counterparty reaching the \$30 billion individual cap. On the year-end date, ON RRP take-up rose to \$475 billion, the highest level to date but generally in line with total RRP take-up on previous quarter-ends. Take-up at the three year-end term RRP operations was minimal, as expected, as these were offered at no premium over ON RRPs and the \$2 trillion aggregate cap assured participants that their year-end ON RRP bids would be fully allotted.

Federal Reserve RRPs with foreign official institutions, shown in the gray area of the same panel, also reached a record level. This was largely expected, being a reflection of year-end dynamics and the ongoing planned increases in foreign RP pool investments by one customer. Of note, this large planned increase is nearly complete.

Looking forward, the Committee will need to decide when and under what conditions it will be appropriate to reduce the capacity in the ON RRP facility, which Gretchen will discuss in the next briefing. As shown in the top-left panel of your last exhibit, the Desk's January policy surveys indicate that an aggregate cap is not expected to be reintroduced for another 11 months, with the median respondent expecting an initial reduction in the cap to a level of \$500 billion.

As shown in the top-right panel, the median expectations regarding ON RRP usage on non-quarter-end days 6 months forward and 12 months forward, the light blue series, are \$225 billion and \$250 billion, respectively, down from previous surveys but higher than the current post-liftoff, ex-year-end average of \$132 billion. Several survey respondents noted expectations that money market fund reforms may exert further downward pressure on repo and bill rates, which could feed through to increased ON RRP usage.

In sum, while our observations of the post-liftoff money market environment are limited, they provide us with some preliminary insights about the operating framework, summarized in the middle-left panel.

The first dimension to assess is control: Are we able to move the effective federal funds rate in the target range the Committee has set out? As noted in the assessment memo of post-liftoff interest rate control, although uncertainty remains, the staff assesses the framework to be working well in this regard. As shown earlier in panels 13 and 16, the framework has been effective in establishing a floor on the effective federal funds rate and supported an appropriate upward move in other money market rates.

It is hard to distinguish the relative weights between IOER and ON RRP in obtaining this control, but we have evidence of activity being driven by both tools. IOER clearly provides a substantial upward pull on rates, particularly in the federal funds and Eurodollar markets, while the ON RRP certainly plays an important role in supporting rates in the repo market and increases the competition banks face in their trading with nonbank counterparties.

It is also hard to know how much of the ON RRP's role in this enhanced competition to attribute to the high cap. One indication the high cap may be playing an important role is that unsecured rates appear to have settled about where they were before liftoff, even though one might have expected the widening in the IOER–ON RRP spread and the lower support from the ELB to result in a greater downward shift. Anecdotally, some market participants have suggested that the increase in the cap over its pre-liftoff value bolstered confidence that there would be ample ON RRP headroom over the medium term, which increased their bargaining power. This argument seems reasonable, but we are uncertain about how high a cap is needed to provide this confidence.

Second, were we able to achieve this outcome without materially affecting the organization of financial markets? So far, despite the high cap, there has been little increase in ON RRP take-up, as noted on panel 18, either in aggregate or at the counterparty level, and little change in overall money market volumes. This suggests that we have succeeded, at least so far, in increasing interest rates without unintended effects on the structure of financial intermediation. In part, the success along this dimension can be attributed to our ability to raise interest rates across a range of money markets and, in particular, the absence of pronounced shifts in relative rates across money markets. In the absence of such shifts, investors have little incentive to make fundamental changes to their lending relationships.

Third, has liftoff had any unintended consequences to consider, particularly with regard to financial stability? Although there is little to say on this at high frequency, it is perhaps notable that amid the recent market volatility and risk aversion, there has been no surge in ON RRP demand.

Looking ahead, market participants anticipate that the operating framework will continue to provide effective control, with nearly one-for-one pass-through of the next tightening into the effective federal funds rate. The Desk survey respondents expect that this control will be facilitated by ample ON RRP headroom and that ON RRP take-up might grow because of changes in the structure of money market rates and spreads prompted by bank and money fund regulatory developments. Although it's hard to be sure about the magnitude and timing of the effect of those regulatory developments on ON RRP demand, the tenor of those survey expectations also seems reasonable.

With regard to other operational matters, market focus on the SOMA's Treasury reinvestments has increased recently due to the large volume of Treasury maturities scheduled in 2016, as shown in the middle-right panel. These maturities will begin in the upcoming intermeeting period, with roughly \$37 billion of expected reinvestments. In line with the current policy, the Desk plans to roll over these maturities proportionally across securities being auctioned on the basis of the Treasury's announced offering amounts.

The bottom-left panel shows the effect of these planned reinvestments on the evolution of the interest rate risk of the SOMA Treasury portfolio, as measured in

10-year equivalent terms, a unit that captures both the par dollar amount and duration of securities holdings. Since the FOMC ceased new purchases of securities, the par size of the Treasury securities portfolio has remained steady at roughly \$2.5 trillion. Ten-year equivalents, however, have declined as securities in the portfolio moved closer to maturity and their duration decreased. For the period ahead, staff projections, shown in the light blue portion, suggest the decline in 10-year equivalents will continue as the portfolio ages further, although the decline is projected to slow should reinvestment of these large Treasury maturities proceed.

Finally, in the memo on small-value tests for operational readiness circulated to the Committee, we provided advance notice of all small-value exercises that the Desk currently plans to conduct in 2016. This was intended to provide a consolidated set of information and reduce the number of memos circulated each meeting. From now on, we will provide updates on the results of any small-value exercises from the previous period and inform you of the upcoming exercises. Our plans for the next intermeeting period, summarized in the final panel, include small-value tests for Treasury outright purchases, euro repos, and dollar liquidity swaps.

Additionally, the Federal Reserve announced plans last year to conduct quarterly TDF tests to maintain operational readiness. The staff recommends conducting a test operation for one week each quarter over the remainder of 2016—the next one is scheduled for February—with the parameters for each operation mirroring those for the December operation. Thank you, and I'd be happy to take any questions.

CHAIR YELLEN. Vice Chairman.

VICE CHAIRMAN DUDLEY. I have a question, Lorie, on slide 19. You focused on the average, but there's a lot of dispersion in both of those charts, in terms of both timing and level. Is that a problem? Are people sort of clamoring for more guidance on when we are going to reduce the cap or what the level will be? Or is that something that is not a market focus at all? The reason why I am raising this, obviously, is that this is relevant to the discussion that we are going to have in a few minutes.

MS. LOGAN. In most of the discussions we had this round, it wasn't a topic that came up because they were much more focused on the volatility that we are seeing in financial markets, and they assumed that there was some time for this decision to be made. So we asked a lot about their framework and how things were trading in money markets. But this wasn't at the top of their minds.

VICE CHAIRMAN DUDLEY. So they're not expecting anything from us.

MS. LOGAN. You can see there are some market participants who expect the timing to be soon, but I don't think it was a big focus. The write-ups and commentary that were circulated certainly mentioned it as a possibility of being discussed with the minutes this round. But, again, there were a lot of other issues in financial markets that dominated the discussion.

VICE CHAIRMAN DUDLEY. Okay. Thank you.

CHAIR YELLEN. Other questions for Lorie? [No response] Okay. Seeing none, Gretchen Weinbach is going to provide us some comments to guide our discussion of the cap and the timing concerning it.

MS. WEINBACH.³ Thank you, Madam Chair. I will be referring to the exhibits titled "Reducing Aggregate Capacity of the ON RRP Facility" as I highlight key themes in the recent staff memo on this topic. As Simon and Lorie noted, the implementation of December's increase in the target range for the federal funds rate went smoothly. In view of the Committee's stated expectation that it will be appropriate to reduce the facility's capacity "fairly soon" after the start of policy firming, you may want to consider when and how to reintroduce an aggregate cap on the facility.

As noted in the first exhibit, our experience with policy implementation to date, both before and after liftoff, leaves us with two key takeaways that are relevant for calibrating the capacity of the ON RRP facility. First, market confidence that the facility will have sufficient headroom over time seems to be important for interest rate control. But there is little direct evidence we can bring to bear on the issue of exactly how large ON RRP headroom needs to be to support interest rate control in the future. Having very elevated capacity of almost \$2 trillion at liftoff may have contributed to the success of the initial policy firming by producing high confidence among market participants in the availability of the facility or by signaling that the Federal Reserve would do what it takes to control interest rates. In the period ahead, the amount of sufficient headroom will likely be lower than that afforded by the current capacity setting, but it could also be higher than the amount—roughly \$150 billion—that prevailed, on average, during the testing phase of ON RRP operations prior to liftoff.

The second key takeaway is that demand for ON RRPs with the Federal Reserve could increase significantly over time. Factors that might contribute to increased demand include changes in financial regulations for money funds and banks as well

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

as a rise in the general level of U.S. interest rates, including the ON RRP offering rate, compared with those on some money market instruments or other assets. Taken together, these factors suggest that there is meaningful uncertainty about the future demand for RRP with the Federal Reserve and thus the usage of the ON RRP facility.

As summarized in exhibit 2, the memo offered three illustrative options for reducing the aggregate capacity of the ON RRP facility, keeping in mind the possibility that demand for RRP with the Federal Reserve could grow over time. It also discussed the high-level policy tradeoffs inherent in choosing among the options. You could initially set a high cap, as in option 1, perhaps in the range of \$800 billion or \$1 trillion; a high cap would make it very unlikely that the cap would need to be increased over time. You might prefer this option if you see substantial headroom as being important for rate control but are less concerned about surge risk and the Fed's potential footprint in financial markets in the near term. Even if you were quite concerned about surge risk and footprint issues over time, you might see setting an initial cap of \$800 billion or even \$1 trillion as a prudent first step in a process of reducing the cap over time.

Alternatively, you might prefer to initially set a lower cap, as in the two other options, because you judge that the level of headroom sufficient for supporting interest rate control is unlikely to be more than several hundred billion dollars and because you want to mitigate surge risk in the near term. If you also judge that it would be important to accommodate trend growth in demand for ON RRP in order to maintain sufficient, but nonetheless limited, headroom, you might choose, as in option 2, to announce that you will increase the cap over time as necessary to maintain interest rate control. Or, as in option 3, you might instead prefer to set a hard cap and make it clear that it will not be increased over time. This approach might be preferred if you wished to limit the extent to which a very large ON RRP facility might alter the behavior of money funds and other institutional investors. Of course, there are some caveats to these broad assessments that we noted in the memo.

As noted at the top of exhibit 3, a related issue is the timing of a reduction in capacity—that is, what constitutes “fairly soon”? If you judge rate control to be sufficient and likely to be sustained with lower capacity in the ON RRP facility, you might choose to reduce capacity as early as the March meeting. Doing so might reduce your concerns about exposure to some risks, including possible surges in take-up, and perhaps also footprint-related issues regarding the Federal Reserve's potential influence in financial markets. Or you might want to wait longer, perhaps because you want to gain more experience with policy normalization or prefer to wait until some upcoming calendar events—such as March quarter-end and the April tax season—have passed.

As noted in the middle panel, how to handle calendar effects on the demand for RRP in the period ahead, such as at March quarter-end, is a somewhat separate issue. We expect these effects will continue for some time and recommend that the Committee continue to provide sufficient RRP at quarter-ends to alleviate the

associated pressures in money markets. Under any of the three capacity options just discussed, calendar effects could be accommodated.

The bottom panel lists some considerations regarding your near-term communications about RRP. First, the minutes to this meeting will note that the topic of reducing the capacity of the ON RRP facility was discussed, which could help lay the groundwork for your future decision. In addition, if you are inclined to accommodate quarter-end pressures by ensuring sufficient RRP capacity, the minutes could also convey that intention. The decision about how to manage RRP capacity around March quarter-end can be deferred until the March FOMC meeting, as it will depend in part on the nature of the cap on ON RRPs in place at that time.

Lastly, we note that the drafts of the domestic policy directive for January that are shown in Tealbook B eliminate the reference to term RRPs because the testing resolution cited in the December directive has expired; it provided authority for term RRPs at quarter-ends only in 2015. If the Committee decides to offer term RRPs in March, the directive could be changed in March to indicate that.

The final page in your exhibits lists the questions for discussion that were included in the cover note to the staff memo. Thank you, we'd be happy to take your questions.

CHAIR YELLEN. Thank you. Are there questions for Gretchen? Governor Tarullo.

MR. TARULLO. Thank you, Madam Chair. Actually, I have several questions, and maybe I'll start with the ones that are more specific. Is my understanding correct, Gretchen, that the way we have been doing term RRPs, at least in the testing phase, would be completely consistent with the SEC's rules for liquidity for government-only money market funds? The reason I ask that is, obviously, to the degree that we're worried about surge or business model effects, if the term RRP actually is perfectly consistent with the external constraints that the money market funds would face, then our choosing to use term RRP really wouldn't make that much of a difference in inhibiting any of those effects.

MS. WEINBACH. That's right. You have been using term RRP at quarter-ends, and that doesn't come with those concerns.

MR. POTTER. Was your point that settlement is two plus zero?

MR. TARULLO. Yes.

MR. POTTER. Okay.

MS. WEINBACH. As far as I know, you're right.

MR. POTTER. But it's a quantity operation rather than a fixed-rate one.

MR. TARULLO. Right.

MR. POTTER. So suppose we run the operation at 9:30 in the morning, and there's an event the night before. The surge would come in, and the rate would change at that point because it's a maximum bid rate, so that's the maximum you can bid. So for people who really wanted the money, what you'd see is very low rates being put in.

MR. TARULLO. I see. So it might have some efficacy as an antisurge mechanism.

MS. WEINBACH. So far it hasn't been intended to do that, right?

MR. POTTER. Well, when we first offered it, we had it at 10 basis points, so we were getting more demand. The way it would do it is, if there was a surge, it's got a price mechanism, which is natural. Hitting the cap in the overnight RRP is a different type of event because we're not expecting that to be hit. So it has a different type of signal when you hit the cap in the overnight RRP. Then we just say, "Here's \$X billion. You can take as much as you like, and we're going to allocate this by just going through the bids, awarding the price that clears."

MR. TARULLO. That's helpful. My second question is—and you may not have the answer to this at your fingertips, but—do we know where nongovernment money market fund holdings are concentrated right now? That is, in which countries, banks, other areas? Because it's not a trivial consideration in thinking about how concerned we should be over the next couple of quarters.

MS. WEINBACH. Right. I don't have a great breakdown of that, but I think a lot of the holders tend to be hedge funds.

MR. POTTER. In the FR 2420, we can see that there are some very large French banks who are funding through the Eurodollar market. Most of it looks like what's called "luxury funding," so it's the arbitrage-type funding. Japanese banks definitely have some other types of issues. Then it's Australian, Canadian, Norwegian—I don't think they're going to be greatly affected by this because they're just arbing through into the interest on excess reserves.

MR. TARULLO. Okay, that's helpful. My last questions are about one of the factors that Gretchen noted in the reasons why demand may increase over time, which is regulation. My first question is on the reference in the memo to some regulations affecting foreign agencies and branches being "in train." If I understand correctly the kind of regulations you were talking about, I wouldn't have characterized them as "in train" so much as "under discussion."

MS. WEINBACH. Yes. We subsequently questioned that wording, so I agree with your characterization.

MR. TARULLO. Okay.

MS. WEINBACH. The example there gave the nature of the kind of thing we had in mind. There had been conversations of possible things.

MR. TARULLO. Okay. And then, am I correct in drawing a distinction between the SEC regulations as they affect the decisions of money market funds, on the one hand, and the possibility, which I think is unlikely to be realized in the short term, of Europe changing its rules on how leverage ratios have to be reported, on the other hand? But let's stipulate, for a second, that that change might take place, thereby affecting how the branches of foreign banks think about the ON RRP. Tell me if I'm missing something here, but it seems to me that those are somewhat different considerations because for the money market funds, their decision is being made with reference, among other things, to what they think we're going to do. That is, whether

to shift from being a prime fund to a government-only fund may be dependent, in no small part, on whether they think there's going to be another half a trillion or trillion dollars available for them to invest. Whereas, if you are a bank and you're just facing capital constraints, you're going to have to adjust from where you are now as opposed to make a decision to start in some new line of business. Is that a fair way of looking at it?

MS. WEINBACH. I think so. That's right, that there would be some element of choice in the money fund conversion to appeal to investors, but taking into account, in some sense, the prevalence of the availability of the overnight RRP as an investment, whereas the other one is an unconditional change.

MR. POTTER. I think for the money funds, they also don't know what the institutional investors are going to do. Suppose prime funds start posting much higher rates. Will that attract some of that institutional money back in that's scared about the regulatory changes? We don't know that. That's probably one of the biggest uncertainties in the money fund complex right now.

MR. TARULLO. Yes. That I get. Okay. Thank you.

CHAIR YELLEN. Thank you. Further questions for Gretchen? [No response] Okay. Seeing none, why don't we begin our go-round. Oh, sorry. Governor Fischer.

MR. FISCHER. Could I ask Simon and Lorie—you have this hint on page 2 of your very clear paper, which I'll read to you, and perhaps you can explain it: “The very elevated setting of the cap may have also conveyed the sense that the Committee is willing to do what it takes to control interest rates”—this in a context in which you're explaining the importance of the cap. And then it continues: “Arguably, this effect could be achieved through other means.” What are the other means?

MS. LOGAN. Different people may have had different means in mind. One example could be, as in option 2, communicating timely adjustments to the cap to ensure it's not binding over some medium-run horizon. I think if there was full certainty that the cap was going to be adjusted such that it wouldn't bind, that would give market participants a similar type of certainty as the high cap might be demonstrating. There might be other options that people have in mind, but that's the way I would have interpreted it.

MR. POTTER. If the only thing that interested you was control of the federal funds rate, there were very many ways we could've done that. We could've drained \$2.4 trillion of reserves out of the system—it would've been quite painful, but we could've done it. But our viewpoint was, there were a lot of other thoughts going into this, and Gretchen tried to go through some of those issues. There's a big issue of some of the trading in these markets. There's probably some bargaining surplus for people to agree about. And by showing a determination to get the rate firmly in the range, we probably helped the people who are investing cash at that point rather than the people who wanted to get cash in and would much rather pay less.

MS. WEINBACH. It's mainly a general thought meant to capture the fact that there are other ways—including, as Lori said, “words,” or as Simon said, “tool adjustments”—that could be used to convey that the Federal Reserve is on the job and that there's not only one way to do that.

MR. FISCHER. But some of that is in option 2, isn't it?

MS. WEINBACH. Yes. Your communications about each of these options is an important feature in making these tradeoffs. You can communicate about each one in pretty different ways, and that might alter the way you make those assessments.

MR. FISCHER. Simon, just one last question. I was thinking that I might be told, “Well, we could go out and do open market operations from the portfolio.” Is that what you’re saying?

MR. POTTER. Yes. We could’ve built up a book of term TDF, term RRP, in a really classic way. We’d just multiply the numbers we used to do by about a hundred or a thousand, and then we’d be there. It just might be disruptive in the market for us to come in for \$300 billion or \$400 billion a day, something like that, and setting term rates. One of the advantages of using the overnight RRP in this particular case—there are other issues with it—is that it zeroes in to support interest on excess reserves and doesn’t have us breaking a sweat each day to do that.

MR. FISCHER. Okay. Thanks.

CHAIR YELLEN. Further questions? [No response] Okay. If not, let’s begin the go-round. President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. Liftoff occurred more smoothly than I anticipated. With the exception of the end of the year, the utilization of the facility has been rather limited. With the federal funds rate and the Eurodollar rate trading well above 25 basis points on most days, it is not surprising that prime money market funds are not making extensive use of the facility on most days. Other short-term instruments of high quality are paying rates higher than the RRP rate. It might be useful in future presentations to distinguish between prime and government-only funds, just to highlight that. For the government-only funds, with more limited alternatives, the RRP facility is more frequently attractive, in part because short-term Treasury rates have been below the RRP rate, as was shown in Lorie’s chart 17.

For many of the days since liftoff, the one- and three-month Treasury bills have traded below the RRP rate. However, this has been a period complicated by liftoff, the end of the year, and significant financial turbulence. If the one- and three-month Treasury bill rates start to trade consistently above the RRP rate, there should be much less incentive for government-only funds to make use of the facility. I think it would be useful to observe how the use of the facility changes as these complicating factors diminish. As a result, I'd prefer to not alter the capacity of the facility at this time and wait to make a decision on the capacity of the RRP facility until we have somewhat more experience with the facility under more normal circumstances.

The primary use of the facility is likely to occur at quarter- and year-ends. This is a manifestation of poorly designed European bank regulations that incent bank window-dressing. The Basel III leverage ratio framework, as Governor Tarullo was referencing, requires a minimum capital calculation at quarter-end. The United States requires averages of daily values throughout quarter for the variables that enter into the calculation of capital ratios used to meet capital requirements, whereas most E.U. nations use quarter-end values. The United Kingdom has recently changed regulations to require the use of averages of daily, on-balance-sheet assets, but U.K. banks don't need to comply until December 2017. Not surprisingly, in the presence of these incentives, the main culprit in window-dressing is the behavior of foreign branches and agencies. If one looks at H.8 weekly data, U.S. bank assets do not decline significantly at quarter-end, unlike foreign branches and agencies that show distinct decreases at quarter-end.

If one examines money market fund data, roughly 30 percent of prime money market assets are liabilities of European banks. However, at the end of a quarter, there's a discernible decline in money market fund exposures to European banks but not a discernible drop to exposure to non-European banks. This implies two possible responses to get at the root cause of

seasonality. First, encourage European colleagues to change reporting requirements. Not only does window-dressing misrepresent the true position of banks to investors and regulators, but it is generating problems discernible in the United States. Second, we should consider ways in which we in the United States can strongly discourage branches and agencies of European banks from dramatically downsizing at quarter-ends. If European regulators want to perpetuate the misrepresentation of their banks' balance sheets and capital cushions, let them do it in Europe, rather than in the branches and agencies they have located in the United States.

An alternative strategy to reduce the dependence on an RRP facility would be to allow the RRP rate to move up more slowly than the IOER rate. So far, the IOER appears to be the main mechanism for keeping the federal funds rate at roughly a 15 basis point discount. Should that be maintained as we raise rates, more slowly raising the RRP rate will discourage the use of the RRP facility as short-term Treasury yields are more likely to be above the RRP rate.

When we decide to make changes to the RRP facility, I would suggest that we start with option 1 and then potentially move to option 2. Whether money market funds use overnight RRP or term RRP would seem to have little implication for the size of the Fed's footprint, as Governor Tarullo was mentioning. The most efficient way to discourage use of the RRP would be to get at the root cause of window-dressing and to make take-up of the RRP facility less attractive in relation to short-term Treasury rates. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Tarullo.

MR. TARULLO. Thank you, Madam Chair. Let me begin by, again, commending Simon, Lorie, and their colleagues at the Desk for their expert preparation for, and precise execution of, the December rate rise, which has relieved us of a bunch of headaches we

otherwise might have had following Christmas and even at this meeting. And I'm glad we're talking about the imposition of a limit on the ON RRP so quickly after liftoff.

Having said that, I want to say that I share some of President Rosengren's sense that it would be good to get a better idea of how things may normalize over the course of the next few months. My only qualification to what President Rosengren said is that I would worry if, as my question to Gretchen earlier suggested, we saw in the process a migration of prime funds to be government-only money market funds potentially premised on an expectation of the availability of a very large cap, which would facilitate such a move. That really is the dilemma that I see. I would like to accommodate possible increases in demand associated with what the memo described as zero-lower-bound effects, but not to accommodate possible increases in demand that are associated with money market funds deciding that this is a good business model for them to move into, as opposed to simply reacting, at the end of quarters when FBOs are not doing as much activity as they normally do.

I would actually not be averse to waiting a little longer on the basis of the best understanding we have that, as of now, there doesn't seem to be much of a migration. But I have to confess, I worry that when it starts, it could start pretty quickly, and some of that \$700 billion in remaining assets referenced in the staff memo could move pretty quickly.

When we do move, like President Rosengren, I'm inclined toward option 1, but I would say option 1 with an explicit suggestion that further periodic reductions in the cap will be forthcoming, because if we don't have that, we might be sending the signal that it's going to be a trillion indefinitely, at which point we might be providing incentives, rather than disincentives, for some of the things that I've been concerned with.

What I most want to avoid is for us to impose a cap and then raise or remove it later. It seems to me that would risk a little bit of a negative for FOMC credibility in managing interest rate increases, but it may also communicate to money managers that we will adjust the ON RRP to accommodate whatever demand does develop. And, again, that wouldn't be the signal that I would want to send. Imposing a cap, with an expectation of lower caps to come, would signal a tapering of the program that should at least limit that incentive.

Now, obviously, a lower initial cap would send a stronger signal, but were the possibility described in the staff memo of the increase in demand associated with the ELB effects to materialize, I suspect a majority, if not everyone, on this Committee would want the ability to set a hard floor for the federal funds rate by using more ON RRP. That's why, as I said, I would prefer to be a little bit more conservative in setting the cap in order to avoid the need to reverse later.

Let's see. Eric made a number of these other points, so I won't repeat them. I think I'll end there, Madam Chair.

CHAIR YELLEN. Thank you. President Mester.

MS. MESTER. Thank you, Madam Chair. I, too, want to thank the staff for the helpful memo. Because we've said publicly that the aggregate capacity on the ON RRP facility would be temporarily elevated at liftoff and that we expected to reduce the capacity fairly soon after the first increase in the funds rate, I don't think it's too soon to consider how we want to approach this reduction in capacity.

I view the main reason for the ON RRP facility is to give us better control of the interest rate. By all accounts, operationally, liftoff was a success. I agree with my colleagues. The combination of our tools proved up to the task, and I thank the Desk and the Board staff that

made that happen. But as the staff memo assessing our control of interest rates says, it's difficult to know the relative effects that the IOER, ON RRP, large aggregate cap on the ON RRP facility, and moving away from the lower bound had in bringing short-term interest rates up to the target. Thus, how high a cap is needed to ensure interest rate control is not known with certainty at this point. But we also have to consider some of the potential costs associated with the facility, especially if the cap on aggregate capacity remains large.

As others have said, there's a possibility during times of financial market stress that firms will turn to the facility instead of their private-sector counterparts and subtract liquidity from the market, thereby exacerbating stress on the markets. Also, a large facility may lead, over time, to operational and structural changes in private-sector money markets. That may affect the viability of the funds rate market over time or other parts of the private-sector funding market. I think, because the Committee is currently studying what its longer-run operating framework should be, we wouldn't want a decision we make today or pretty soon to, in effect, take an option off the table for our operating framework.

Some of these cost-benefit considerations led the Committee to decide, as indicated in the normalization principles, that it would use the ON RRP facility only to the extent necessary to help control the funds rate, and that it would phase it out when the facility is no longer needed. Those principles helped guide my thinking on the questions posed in the staff memo.

Regarding an approach to scaling back the size of the facility, in general, I don't think we should be moving the maximum size of the facility up or down at high frequency. Admittedly, there are still some questions about what size of the facility is needed for interest rate control and what the demand on the ON RRPs will be, and the memo discusses, in a pretty in-depth way, some reasons to think that demand will be rising over time. In addition, we've had only one rate

increase, and we've experienced only one quarter-end since liftoff. I think we should avoid being overly confident in our ability to raise short-term interest rates.

Given these considerations, I think we should come to some determination of the appropriate size, conditional on our current estimates and expectations, and then use term RRP's to offset changes in demand that will result from calendar effects, like quarter-ends. At some point, consistent with the normalization principles, we'll determine that the facility is no longer needed, and we'll have a plan for phasing out the facility, perhaps by reducing its size. I think this puts me closest to the memo's option 3, but I'm perhaps less dogmatic about never being willing to raise the cap, in view of some of the uncertainties about demand. If it turns out that we've set the cap too low for adequate control of interest rates, we may indeed have to revisit the size, but I don't think that should be our default intention. I think we can use language similar to what's in our normalization principles—indicate our plan, but also say that we would be prepared to make some adjustments, if necessary, in the interest of interest rate control.

Given the take-up to date, the \$400 billion to \$600 billion aggregate cap in option 3 seems reasonable to me. But because we're very early in the normalization process, and our estimates of trend demand are not certain, I'm not fully confident in that size and would like to see more analysis supporting that. I see some merit in waiting until after the March quarter-end to initiate a reduction in the cap to gain more experience during a period of potentially elevated demand.

If the staff indicated that implementing another funds rate increase would be a very valuable experience in determining the appropriate size of the facility, then I wouldn't necessarily be averse to that, but I think the communications reconciling this with our previous indication that we would reduce the size fairly soon after liftoff would have to be carefully done.

The minutes of this meeting will reveal that we've had this discussion, and, as the staff memo suggests, it could be used to indicate the Committee's intentions with respect to the cap. Thank you, Madam Chair.

CHAIR YELLEN. Thank you very much. President Lacker.

MR. LACKER. Thank you, Madam Chair. A couple of comments before answering the questions. The gist is willingness to begin with the end in mind, the ultimate objective for the ON RRP facility. We actually decided on our objective in September 2014 when we announced that the Committee will phase it out when it is no longer needed to help control the federal funds rate. So how will we know when the facility is no longer needed to control the federal funds rate? The staff memo focuses heavily on the short-run tactical question of what to do next with the overall cap, and they didn't provide an analysis of this question of how to know when the facility is no longer needed to control the federal funds rate. In fact, they haven't proposed how we're going to find out, either.

We spent a lot of time discussing whether the overnight RRP facility was necessary to control the funds rate before liftoff, but at that time the one consideration that seemed to trump all others was the desire to avoid the embarrassment of raising the target range for the federal funds rate and interest rate on excess reserves and not having money market rates follow right along. We used to refer to this as the "egg on the face" risk. So we did it. We raised our administrative rates, and market rates came right along as we predicted and hoped, and we didn't get egg on our face. So I think that we can think about the role of the overnight RRP facility without that dreadful fear trumping everything else and indicating, well, we have to have this program.

Now, the question is, to what extent is the funds rate being held up by the interest rate on excess reserves as opposed to the overnight RRP rate? The staff doesn't know. They were agnostic, or maybe they just couldn't agree on it—they didn't say one way or another. The natural way to answer this question, it seems to me, is to do some tests. We did some testing before in 2014 by varying the interest rate we paid on the overnight RRP facility. I think we should do some tests again. The memos don't make any mention of changing the RP facility rate, and I find that surprising. There is a lot of discussions of demand and how demand might rise over time. Obviously, demand depends on the price, though, and surely it would vary.

It seems plausible to me, looking at what's happened since liftoff, that the funds rate doesn't depend much on the RP facility rate. That seem really plausible to me. The fact that the funds rate fell below the RP facility rate at the end of the year suggests, as the staff indicated, that overnight RRP's at our facility are not a very good substitute for funds rate transactions due to the time of day the funds get returned. It strikes me that we could learn more by moving the rate. Now, President Rosengren suggested moving the facility rate less than we raised IOER when we raise interest rates. I'm not sure we have to wait for a rate increase to do that. I think we could undertake an experiment like that later this year.

We're talking about the funds rate, and our objective is to control the funds rate and keep the funds rate within the target. The question is, could lowering the rate on the overnight RRP facility result in a decline in market RP rates? That's not obvious, because the market RP rates are above our facility rate now. It could be that that spread is determined by the market, and that spread will remain constant, and the RP market rates will fall if we reduce the facility rate. That could be. But if that does happen, it's not clear it should bother us, because our announced goal is to control the federal funds rate, and we used to not care about the RP rate. We used to let the

spread be determined by market, and the market set the spread at various rates at various times. It was never a concern for the Committee. So I think there's an open question, and it would be useful to get the staff working on it. I understand that the long-term framework project is going to be examining these and other questions presumably, but for us I think it's important to remember that our objective is to phase out this facility if it's no longer needed to keep the funds rate within the target, and I think we need to find out whether it's needed or not and reduce the facility appropriately as we learn.

For the questions, I would prefer option 3—a low hard cap—because I think it would more rapidly ramp down market expectations about the ongoing scale of the program in the future. Quarter-end fluctuations have been a feature of money markets since—I want to say the beginning of time, but let's say before the crisis. And, again, they never really bothered the Committee because it never really made a difference for monetary conditions. I don't think we should change the parameters for quarter-end.

For communications, I'd suggest that we say that we believe that the interest rate on excess reserves is able to carry most of the weight in controlling the funds rate, and that we'll do some experimenting as we go forward to confirm this, and we expect to phase out the ON RRP program gradually as evidence accumulates that IOER is sufficient. As for timing of putting a cap on it, March isn't too soon for me, but I've heard other views around the table, so we'll have to discuss that in the future. Thank you, Madam Chair.

CHAIR YELLEN. Thank you very much. President Harker.

MR. HARKER. Thank you, Madam Chair. I'm in favor of being forward looking, but even then it seems a bit early to me to be making a decision on this matter. For me, the overriding concern right now is maintaining control of the federal funds rate. I believe it's

important that we maintain maximum flexibility until we're well on our way toward policy normalization.

Given the uncertainties about how demand for overnight RRP will develop and how gradually we will be normalizing policy, it seems to me that now is not the time to signal to markets that we will be reducing aggregate capacity for this facility. So I prefer an approach that would have us implement a flexible cap once the fund rate target hits a certain level—say, for the sake of argument, 1 percent—rather than adhering to a date-dependent schedule. At that time we should have a much clearer picture about the normal take-up of the facility, and we could be more confident about how gradually capacity can be reduced without unnecessarily imposing worries about headroom on participants.

Now, if there is a strong view about setting an aggregate cap now, I prefer we set it at a very high level that would reassure markets about our continued willingness to support demand for overnight RRP in the early stages of policy normalization. As for calendar-based pressures, I'd prefer that we use term RRPs to meet that demand. If we proceed at this gradual pace and markets are settled in the use of the overnight facility, I believe our communication about reducing the capacity of the facility will just simply be that much easier. Thank you, Madam Chair.

CHAIR YELLEN. Thank you very much. President Evans.

MR. EVANS. Thank you, Madam Chair. I'd also like to commend the Board staff and New York for such excellent materials on the design and the implementation that prepared us for the programs that were put in place so that things would run so smoothly. It's really been a big help.

The Committee has previously agreed that the ON RRP facility will be temporary. I continue to support this approach, and this bears repeating in our announcements. I'm inclined to favor option 1. I think that reducing the cap from its current \$2 trillion level down to the \$1 trillion cap envisioned in option 1 would help remind the markets that our eventual goal for this temporary facility is to wind down the program. At this point, like, I think, Governor Tarullo, I could support periodic reductions in the overnight RRP capacity from time to time. I'm not a big fan of option 2, with the flexible adjustments. I think we could move to the \$1 trillion cap fairly quickly, within a few meetings, but there's no need to rush toward a lower hard cap, as in option 3, until we've had experience with multiple rate hikes and have more information on the real size and effect of this market.

Regarding end-of-quarter pressures, frankly, it's not clear to me how important this issue really is. During my time in the System, the federal funds rate has often traded away from target for a short period around quarter-end, sometimes spectacularly. These short-term seasonal variations have not had any significant effect on achieving our policy goals, as near as I can tell, or the ultimate reliability of the monetary policy transmission mechanism itself. I'm not saying there wasn't pain for various financial participants, but quarter-end federal funds rate spikes did not leave an imprint on macrodata, as near as I can tell. Knowledgeable market observers know that these seasonal effects exist, and they adjust their interpretations of rate movements accordingly.

Finally, regarding communications, for now I think that we should reiterate that the facility is temporary, but that the timing and size of future reductions in the cap will depend on how the normalization process is proceeding. Thank you, Madam Chair.

CHAIR YELLEN. Governor Tarullo.

MR. TARULLO. Thank you, Madam Chair. Something that Presidents Lacker and Evans have now both said makes me want to ask the two of them a question. Is one or both of you saying that you would be willing to accept some softness in the federal funds rate around the end of quarters, and that's what you mean by not worrying too much about the window-dressing effects?

MR. EVANS. Absolutely.

MR. LACKER. Yes.

MR. TARULLO. Okay.

MR. LACKER. It always happened, yes. It always used to happen, and it was inconsequential. What matters is longer-run rates, and they're going to average through the quarter-end.

MR. EVANS. Well, it would matter if it makes it into the two-year rate or the three-month rate or things like that, lending rates.

MR. TARULLO. That also gets back to the issue of reporting requirements that President Rosengren raised that I should have but didn't comment on.

MR. POTTER. There is a very important difference from before the crisis. Our balance sheet on the liabilities side was currency plus a little bit of reserves. Now, it's currency plus about \$3 trillion of other liabilities which the system has to deal with.

MR. LACKER. But we're talking about what rates do. It's a question of whether you mind rates going 5 basis points, 10 basis points lower. It's the same question whether we have a giant balance sheet or a little one. I don't get it.

MR. POTTER. I don't think it's quite the same because of how many liabilities there are in the system.

VICE CHAIRMAN DUDLEY. Are you talking about just the frictional cost of moving all that money around?

MR. POTTER. Yes. It's a different situation when you see the contraction. It's a much larger contraction that you see in the volumes in the money markets. The people who are getting hurt by that are the people who are trying to invest. It's not the dealers, which used to be the other ones who were doing the window-dressing, or the large European banks.

MR. LACKER. You're talking about the dollar volume of people who are affected by a lower rate on quarter-end.

MR. POTTER. That's one version of it.

MR. LACKER. And it might be different for a different sort of scale as people invest a different amount.

MR. EVANS. So it's the maturity of their borrowing that we're talking about? A couple of days, or are they going to lock in a one-year rate because they show up on the wrong date right before the end of the quarter?

MR. POTTER. There's about \$700 billion to \$800 billion, which is overnight, plus some other terms. So it's quite a lot of that. Some of that has just been produced by the size of our balance sheet.

MR. EVANS. So if they're going to get a bad trade near the end of the quarter and they understand that this is the environment they face, then they're going to start moving their money around earlier.

MR. POTTER. I'm not explaining myself. The money has to end up with the Federal Reserve somehow, and there are easier ways for it to end up. The overnight RRP or term RRP

are ways for it to directly go there rather than go through some complicated structure in the financial system. So it's more of a plumbing issue with that much money moving around.

MR. EVANS. I scribbled down some notes as I was listening to President Lacker. I was sympathetic to what he was saying. For the longest time, the FOMC and the conduct of monetary policy has been about the funds rate. And the New York Desk does a great job of telling us about how hard it is to implement that when the funds rate trades soft over a long period of time, how other market rates are affected. But at the end of the day, it's really the funds rate. As we move closer to an environment in which we're away from the effective lower bound, I think that's going to be the most important thing. We've ended up, because of the lower bound and all of our programs, having to discuss things at this meeting that normally took place at the 9:20 calls and things like that. If they're really as important for the transmission mechanism as maybe Simon is suggesting, I guess we need more information, because I don't see it that way.

MR. POTTER. Sorry. There's a market-functioning issue and a rate issue, I think.

CHAIR YELLEN. Lorie.

MS. LOGAN. I just wanted to mention that, in the old framework, we did take actions to try to alleviate the quarter-end effects. We just couldn't do it because we were on the maintenance period. I wanted to make it clear that, in the old framework, we were making a lot of decisions to try to adjust the level of reserves to smooth through the quarter-end.

MR. LACKER. Right. You did, but you often didn't completely offset it.

MS. LOGAN. We weren't able to. But it was always a goal of the implementation path to try to offset those effects.

MR. EVANS. Sure. But Jim Hamilton had a paper in the *Journal of Political Economy* many years ago about the spectacular, spectacular spikes in the funds rate that occurred, and I don't know of any evidence that those spikes made their way into macrodata or things like that.

MR. POTTER. That's correct. They certainly didn't and might not now, but there the size of our balance sheet has a market-functioning aspect that could affect quarter-end trend behavior.

MR. ROSENGREN. Could I ask another question of Simon? No one really knew what the end-of-the-year rate was going to be going in. So many things were new this time. But if we systematically saw the rates drop to, say, zero if we did nothing, it would start leeching into those other rates, predictably at the end of every quarter and every year. So we'd start trading soft instead of trading in the middle; presumably the arbitrage would get us to start being much closer to the floor before the end of the quarter and end of the year.

MR. POTTER. That's possible. I think the issue for many people is: They have a lot of cash to invest, and they have a relationship that is not as robust on the quarter-end. Where are they going to put that cash? They want to invest on the quarter-end. They will take action to make sure they can invest on the quarter-end if they think there's less of the Federal Reserve balance sheet available, and that would lead to softness in rates. It also leads to inefficient behavior because a lot of the cash they have to invest is coming from the size of our balance sheet.

MR. LACKER. To go back to your question, Governor Tarullo, this isn't about market functioning, it's a distributional issue—it's who pays for the privilege of investing cash at quarter-end. You've got a lot of cash around. You can make a lot every other day of the quarter, but at quarter-end, you don't have relationships. You've set up relationships with foreign banks

that are doing the arbitrage to IOER. Part of what you pay for doing that is that on quarter-end, you don't have relationships elsewhere to invest the cash. To some extent, for us to defray that cost, for us to reduce the cost of having nowhere to invest your cash on quarter-end, we're just making it easier for the foreign banks to do this arbitrage. We're just shifting costs around these players. It's less market functioning than just a distributional question.

MS. LOGAN. One last note is, what we're seeing in unsecured markets is that it's a day at month-end and quarter-end. But for repo markets, if you look at the data, it takes multiple days for the balance sheets of some of those dealers to come down and then multiple days to build back up. What we saw in September when we did the test in which we put the cap in and didn't have the term is that the softness was not just on one day, it was several days in advance. I suspect that if we didn't provide it, we'd be talking about more than one day per month—we'd be talking about a couple of days, both before and after.

MR. POTTER. But you would distribute the softness over time, so the financial system would find a way of dealing with all of those reserves. If they thought that it was going to be harder to invest on the quarter-end using the Federal Reserve's balance sheet in a direct way, they would find a way to distribute that over the quarter

CHAIR YELLEN. Governor Fischer.

MR. FISCHER. Can you tell us, what is the cost to the Federal Reserve of supplying the Federal Reserve paper that they want?

MR. POTTER. The overnight RRP offer rate right now is 25 basis points below the interest rate on excess reserves. When we issue term, it's probably going to be 3 basis points above. If you look at it the other way, if you want to save a little bit of money at quarter-end, which I don't think is of interest here, using the overnight RRP is a little bit cheaper because you

don't get it as a reserve balance as it finds its way back into the banking system to be a reserve balance.

MR. FISCHER. Sorry, who's "you"? Who saves the money?

CHAIR YELLEN. We do.

MR. POTTER. The U.S. taxpayer would, because we'd remit more to the Treasury.

MR. LACKER. But were you asking about the operational costs, like how many people they have doing it?

MR. FISCHER. No, not at all. I was asking about the interest costs.

MR. LACKER. It saves us money, because it saves reserves—IOER.

MR. POTTER. Because what will happen is, if we don't offer another type of liability to the financial system, that money has to get back to our balance sheet, and it will find a way of getting there. At that point, it receives interest on excess reserves.

CHAIR YELLEN. Okay. President Bullard.

MR. BULLARD. Thank you, Madam Chair. I support option 1, which is the high-cap option, but I want to align myself with comments by President Harker and President Evans, who have similar themes. My preference is actually to have no cap at this point and to watch and wait during the next six months or so. I'd consider what President Harker suggested, that you should have some idea about where the funds rate is before you start putting a cap on this facility. I think we want maximum emphasis on rate control during this phase that we're in right now. I'm also encouraged that actual take-up seems to be quite low at this time, and so for this reason I don't think we really need a cap right now. I think it's a little premature to put that on.

Now, I agree, if the program grows to a substantially larger size, the Committee could at that point review the reasons for the expansion of the program. One way we could proceed—this

is just something to consider here—is to simply agree to a size of the program that would trigger further review, and possibly you could announce to the public that the Committee would review it at some point if the program got larger, but that wouldn't be an official cap. You'd just say that the Committee is going to look at this again if this thing starts to grow, because one thing that seems like it might happen in the future is that you'd remain with relatively small take-up, and you wouldn't need a cap, and you wouldn't get much growth in the program. Now, I understand it may not go that way, but then we'd have a way to review that possibility. So I'd actually be willing to go with the possibility of no cap indefinitely, depending on how the demand develops as we go forward. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Powell.

MR. POWELL. Thank you, Madam Chair. Let me say, I think it's great to have this discussion now when there's no near-term problem to solve and no really urgent need to act. Broadly speaking, the RRP is doing its job well with IOER. I would say that it's clear that reserves are going to remain superabundant for a number of years now, and that's probably going to mean that we're going to need the RRP, and we'll be facing these issues for a number of years. The place to which I would like to see this go in the medium term, two to three years, is more at the level of option 2, which is \$300 million to \$500 million. I would be comfortable—

MR. TARULLO. Billion.

MR. POWELL. Billion—thank you. I would be comfortable starting with option 1 and saying explicitly that we expect to reduce this over time, as appropriate. The problem with option 1, just putting the number out there and not saying that you expect to reduce it over time, is that you send a signal that you welcome, and perhaps even encourage, more funds. But that would be perfectly acceptable in my view.

In terms of when to start, I think it is tied up with the path of policy. If the Committee is going to be in tightening mode as the year goes on, then it seems to me it would be useful to have one or two more rate increases in place to see how the federal funds rate behaves in space as it moves away from the lower bound. If that's not going to be the case, then it might well be appropriate and a useful signal to send as soon as the March meeting that you're reducing the cap from \$2 billion-plus to effectively \$1 billion. That might be a useful place to go.

CHAIR YELLEN. Trillion.

MR. TARULLO. You've got to get your orders of magnitude right. [Laughter]

MR. POWELL. Sorry. Missed some zeros. The memo asks about quarter-ends. As far as quarter-ends go, I like using term RRP at quarter-ends. It seems to work. I'd say, keep doing what works. Those are my comments. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Madam Chair. I also would wait. Just in view of the tone of the memo and the presentation, the New York staff don't appear to have conviction yet on judgments about these market effects. So my advice to them would be, do what you need to do to get conviction on these judgments, and that implies that it would be helpful if we had one or two more tightenings. We'll see when and how that happens. But on the idea of doing experiments and other activities so that you can have more conviction about how much headroom you might need, it's clear to me that, in terms of priorities, maintaining confidence that we can control the rate is paramount. I do think we need to make clear that we're not going to accommodate all private-sector choices. We're not here to do that. We're here to control the rate, and accommodating all private-sector choices is not why we're doing this. If I had to pick a choice to gravitate to, it would probably be the high end of the staff's low flexible cap—in the

middle, \$500 billion or more. But I don't think I know enough to know, and it sounds like the staff don't yet know quite enough to know. But as soon as you do have more conviction and at the point we make this decision, I'll be asking the staff for their recommendation on all these questions, and I probably won't give a judgment until I get their recommendation. That will probably be the approach I'll take. Thank you.

CHAIR YELLEN. Thank you. President George.

MS. GEORGE. Thank you, Madam Chair. I, too, appreciate the staff's work to characterize the challenging and important tradeoffs we face with the ON RRP facility in the future. Having viewed this facility as essential to controllability of interest rates, especially at liftoff, my preference among the options discussed at this point would be to reduce the capacity of the facility as described in option 2, the low flexible cap, and I would lean toward the higher end of that range. This option would maintain adequate headroom for markets to have confidence about the availability of the facility while credibly communicating our original intention that the capacity be elevated only temporarily at liftoff to support policy implementation, and that it would be appropriate to reduce the capacity fairly soon after liftoff.

Regarding quarter-end pressures, it is not clear to me that we should react with this facility. Missing our target funds rate on one or two days because of these pressures would not seem to have material policy implications, notwithstanding the counsel that Simon provided during our previous discussion. But to the degree that such pressures proved persistent, I would not object to a temporary increase in the cap as proposed under the low flexible cap option or offering term RRPs.

For communication, I would explain the change in the capacity of the facility as the result of a successful liftoff of the target funds rate from its effective lower bound. And in the future,

the capacity should be no greater than what is required to achieve an effective floor under money market rates. I see such an approach as consistent with our stated intention of, in the longer run, holding no more securities than necessary to implement monetary policy efficiently and effectively.

Given our experience with successful liftoff, I believe it would be appropriate to reduce the capacity of the facility as early as our March meeting. I would signal that intention in the minutes of this meeting. Thank you.

CHAIR YELLEN. Thank you. President Lockhart.

MR. LOCKHART. Thank you, Madam Chair. In answer to the question of how to approach reducing aggregate capacity of the overnight reverse repo facility, I prefer to think a little beyond a single choice from the menu proposed. I have the working assumption that the goal is to largely phase out the facility over time, in keeping with our 2014 statement on normalization principles and plans.

At liftoff, I was in favor of prioritizing monetary control and fully supported the lifting of the cap. However, I do have some concern that a decision to continue running a very large facility for a prolonged period entails nontrivial financial stability risk. In addition, such a policy might incent or enable changes in money markets that might make it much more difficult to reduce or phase out the facility in the future.

With these thoughts in mind, I favor thinking in terms of a sequence of steps or a strategy, if you will, for gradually reducing the footprint of the facility in a manner that places strong emphasis on monetary control. As an illustration and illustration only, I envision a process that could go something like this. Begin by implementing a high cap accompanied by communications to establish the expectation of a ratcheting down to an ultimate phaseout. I

think it would make sense to maintain that cap through at least the next rate increase as a conservative approach to managing monetary control risk. Assuming things go well and the funds rate trades in the desired range, at the subsequent meeting we can move to a lower flexible cap. It makes some sense to me to test the headroom effects following a meeting that does not involve the confounding effects of a rate increase. If monetary control seems well established with a lower flexible cap, I see making a subsequent further step that's not offered as an option in the memo—specifically, at the next rate increase, I'd prefer to leave the overnight reverse repo rate unchanged, thereby widening the spread between the IOER and reverse repo rates. I think this step will be necessary to truly test how necessary the overnight reverse repo facility is to maintaining control over the funds rate. Once we've tested the waters with a wider spread, we can evaluate next steps in terms of fixing the cap or implementing further increases in the spread and whether to phase out the program entirely or retain some residual facility. The latter—some small but continuing overnight reverse repo operations—might be desirable as we work through the long-run framework questions and consider some of the regulatory and market changes noted in the staff memo.

I offer these specifics as an example of what a longer-view strategy might look like. I would certainly be open to other paths and options. The important point is that we not think of the next move with the facility as a one-off decision. We should have in mind what we intend to do over several steps down the road and communicate our plans to the market. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Williams.

MR. WILLIAMS. Thank you, Madam Chair. The normalization strategy and principles that we laid out some time ago have worked according to plan, and I don't see any signs in recent

market behavior that would suggest any change in our approach. But I emphasize here that by “approach,” I’m referring to both our September 2014 and our March 2015 communications that the ON RRP facility will be temporarily elevated at liftoff, but that the capacity will be reduced fairly soon after policy firming and that it’s a temporary program.

The success in maintaining monetary control is a testament to the thorough testing of our normalization tools—a good example of practice makes perfect. In light of this success, I would continue along the path we’ve laid out. Our next step should be to start lowering the cap on the ON RRP facility to reduce financial stability risks associated with possible surges in demand. I think option 1 provides for a prudent reduction that still should provide ample headroom to maintain monetary control. When the appropriate time comes, I would be comfortable with reducing the cap to \$800 billion or \$1 trillion. I think we can take this step fairly soon—in the language of our earlier communications, in the next few meetings. Obviously, waiting until March quarter-end might be useful. I don’t think we should necessarily wait until the next rate increase.

I agree completely with Governors Tarullo and Powell that in making that step, we want to communicate that this is only a first step and not the end of a process, and that further decreases in the cap will be forthcoming. I think that’s an important part of the communication regarding option 1. Over time, we can lower the cap for the ON RRP facility further. However, there’s no rush to take that step. We should collect more information along the way to make sure that we’re on the right track. Assuming all goes well, additional reductions would be warranted after we’ve observed market behavior following further rate hikes.

In addition, as we lower the cap further, term RRPs could or should provide a good supplementary tool to deal with quarter-end spikes in demand, if needed. In this regard, we’ve

had a good discussion about whether that's necessary or really important. I do think that the term RRP tool has shown to be a pretty elegant solution to this issue. Once we get to the point at which the cap is much smaller, using the term RRP seems to be a useful way to deal with quarter-end issues and spikes in demand.

When we decide to make these adjustments, communicating clearly with the public that these are natural steps in the normalization strategy that we've already explained is going to be very important. We want to convey that our approach has been successful, and that's why we're continuing to follow that in a well-designed strategy. Importantly, communication we give following these changes should, as always, stress their technical nature and emphasize that monetary policy is focused on the setting of the federal funds rate and that all of these other things that are happening in the background are being done in support of monetary control and our other objectives. Thank you.

CHAIR YELLEN. Thank you very much. President Kashkari.

MR. KASHKARI. Thank you, Madam Chair. I think the memos and the staff briefing on this discussion show that we have a lot more to learn about this program, and so I'm in the camp of many of you that there's no rush. Let's learn more. Let's get more experience before we make any changes. To me, it's fundamental that we have a better view of the long-run operating framework. That's a pretty fundamental decision for the Committee. And, for me, having more information about how this tool works and having a better view of the long-run operating framework will be important in informing the ultimate judgment of what this tool looks like. If pushed today, I'd say I'm in favor of option 1 or option 2. But waiting is probably my stronger preference. Thank you.

CHAIR YELLEN. Thank you. Governor Brainard.

MS. BRAINARD. Thank you, Madam Chair. Again, I want to extend my compliments to the staff on their execution of liftoff, which was really outstanding. The control over rates has been as strong as any of us could have wished. The strength of the monetary control so far can be ascribed in no small part to the floor that's been provided by the ample capacity of the ON RRP. And for this reason, I think it's still premature to implement changes to the cap.

Although the activity of the ON RRP has been quite close to pre-liftoff norms so far, it's only six weeks since liftoff, and there's still substantial uncertainty about how our rate control might evolve as normalization proceeds. I'm particularly attentive to how both the activity of the ON RRP and the support for the funds rate provided by the ON RRP facility change as we move farther away from the effective lower bound. For that reason, I prefer deferring changes to the ON RRP cap until normalization is well under way. Indeed, this would seem to be pretty consonant with market expectations.

Of the three options presented in the staff memo, I prefer setting a high cap as a first step, as outlined in option 1. At the stage of normalization at which we find ourselves, as you can probably infer, my highest priority remains monetary control. For that reason, I think option 1 has the best monetary control properties—certainly better than option 3, which would sacrifice control for a smaller footprint. Compared with option 2, option 1 is both easier to explain and easier to implement, which I view as strong virtues in policymaking. It's not obvious that the cap in option 2 could be adjusted in as timely and accurate a manner as would be necessary to maintain the level of monetary control that I think is important.

Nonetheless, I do think it's helpful to remind market participants that the heightened capacity of the ON RRP is temporary in order to guard against a permanent change in the

structure of money markets, which I would view as very undesirable. A reflection of this discussion in the minutes should accomplish this goal. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Fischer.

MR. FISCHER. Thank you, Madam Chair. Like everyone else, I'd like to congratulate the staff, both the New York Federal Reserve staff and the Board staff, on the work done and the quality of the paper we received, which is both thorough and interesting. And, of course, I'd also like to congratulate them on the success of the operation of our new method of monetary control, which was faced with a pretty strong stress test in the first six weeks of its operation—at least the past three weeks of its operation—as the market seemed to be less than stable, and it didn't seem to spread over to the use of the RRP facility. One of the benefits of going very near the end is that everything that should be said has been said.

MR. TARULLO. Not everyone has said it. [Laughter]

MR. FISCHER. It just remains to decide which of the excellent interventions to reference, and I reference President Evans's approach, which is similar to what a lot of other people suggested.

I don't think, as many have said, that after six weeks, it's a good time to start changing things. A lot can happen, and we want to make sure that this facility and the way we're operating it is really capable of doing what it's done so far, and it's only further experience that will be able to tell us that.

I also have some sympathy for the view that it could be useful to retain a small facility at the end, but that's an issue that we can discuss nearer the time. What I'd like to see is what I think President Evans said, which is a move—most people say in the second quarter, I think it could be the end of the second quarter, possibly the third quarter—to option 1. Then, as time

goes by, and as we get more and more confident in our use of it, begin reducing the cap in a fairly steady way over the course of time and then phase it out, with the question of whether there should be some capacity left to carry out these operations.

As we move to the hard cap, I do think that we'll have to either accept the use of term RRP or allow ourselves not to hit the target federal funds rate on a couple of days in each quarter and possibly more at the end of the year. But this is clearly something that's working, and it seems to me there's probably an interesting question as to what comes next, adjusting the RRP or stopping repurchases of maturing assets in the portfolio. We haven't talked about those two things together, and each of them could be regarded as capable of creating some noise in the system that we ought to find a way of coordinating. Thank you, Madam Chair.

CHAIR YELLEN. Thank you very much. And, finally, Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you, Madam Chair. Well, I think the consensus around the table is that the overnight reverse repo facility is working well, and that we're pleased by how solid the flow has been, even as the take-up has been quite modest. To me, that seems like the best of both worlds. We have monetary policy control, and we have a modest footprint. That suggests to me that there's little urgency to make changes at this time. Why not learn more and proceed relatively slowly? It doesn't seem like there's any rush in terms of market expectations, either. We saw in the survey results that there's a wide range of expectations among market participants, and I deliberately asked Lorie a question about whether they were waiting with a lot of interest to see how we were going to answer this question, and the answer seems to be, "Not really." This is not something that we need to resolve quickly because there's a big question in the marketplace.

Now, I think there's some uncertainty about how the facility usage is going to evolve over time, and I'm sympathetic with the staff memo that suggests that, most likely, it's going to rise rather than fall, everything else being equal, with money market fund reform and possible future regulatory changes the major factors. For that reason, because we don't know really how high demand is going to get over time, I favor option 1, a relatively high cap. I also think a high cap has tremendous benefits, and this goes back to something that Governor Brainard said. There's much less drama, and there are fewer communications problems, if you have a high cap. You don't need to have term RRP at the end of quarter-ends to accommodate temporary surges in demand at quarter-end. You don't have to explain why you're paying higher interest rates on term RRP, rather than using the lower rates that are on the overnight RRP. You don't have to adjust the cap up and down as demand fluctuates. It seems to me that having a high cap, at least for a while, seems like a very simple and straightforward way to proceed.

Now, I do recognize that having a relatively high cap could lead to issues in terms of footprint and financial stability, and so the question is, how big are those risks? On the footprint issue, I think we've already had some success in addressing this. As long as we make it clear in the minutes that this is not a facility that's going to be around indefinitely, that can continue to damp expectations about the ability to develop your business plans to adjust to the idea of an overnight RRP facility being around for some time. At the current time, I don't think the footprint issue is really very significant. That could, obviously, change. If it were to change in the future, then I think we would have to think more seriously about doing something in terms of the cap or in terms of changing the spread between the overnight RRP rate and the IOER rate in the future, but there's no need to address this right now.

In terms of the financial stability risk, as I understand the concern, it's that if we had a high-capacity overnight RRP facility, there could be a big flight out of short-term private debt instruments, and that could put upward pressure on the interest rates for those instruments. I personally don't see this as a huge risk. While we could see some upward pressure on other money market rates, this should be at least partly offset by the fact that if there is an overnight RRP facility that has lots of headroom, you also have a place to flee to. The fact that there is a place to flee to means that you don't have as much incentive to run at the first sign of trouble, because it's known that there's a place to go in the future should things get worse. Also, I think that if there was a rise in private-sector short-term rates, and if it was significant and had sufficient persistence to cause us to be worried about the implications for the economic outlook, there are other things we can do about it. We could adjust monetary policy. I suspect that in a circumstance in which there really was a large amount of funds flooding into the overnight RRP, the rise in usage of the overnight RRP would not be the first concern that we would have. There would be something else going on that we would be really focusing our attention on.

In terms of communication, I think we should continue to emphasize that we want the facility to have sufficient headroom so that the cap won't bind, because monetary policy control is our primary focus here. If participants in the market understand that the cap is not likely to bind, that improves their bargaining power with banks. That makes banks more aggressive in bidding for funds, and that actually makes the IOER more effective in pulling up short-term rates. So there's a real benefit of having cap capacity in the overnight RRP, even if the overnight RRP facility isn't used that much. In addition, assuring people that there's going to be room in the overnight RRP facility underscores our commitment to monetary policy control, and I think that's really important, as many people have said today.

With respect to timing, I don't see any reason to rush. I'm not sure it should be the second quarter or the third quarter. I think it certainly shouldn't be March. Let's get more experience with the facility, and then we can figure out how to proceed.

I want to talk a little bit about what President Lacker brought up, because I thought he raised an interesting set of issues. And that is, we still don't know the answer to the question, what's doing most of the work in pulling up short-term interest rates? Is it the IOER, or is it the overnight RRP facility? I think that's an interesting issue, and so there are a couple of questions here I guess I would pose. One question is, do we need to find out the answer to that question? Now, if we're really comfortable with the overnight RRP facility, then presumably we don't really need to try to run experiments to answer the question about whether the overnight RRP facility is doing most of the lifting, or the IOER is doing most of the lifting. Now, if we're uncomfortable with the notion that we really need the overnight RRP facility to raise short-term rates, then it makes more sense to run the experiments, because I think there's a cost to running the experiments. I don't think the experiments are free. The point I'm trying to make here is that if the outcome of the experiments is not going to change your choices in terms of how you set the facilities, then it probably doesn't make sense to run the experiments. But if you think the answer to the experiments could change how you use the facilities, then it probably makes sense to run the experiments. What I'd like to do is see the staff come up with a proposal on how important it is to find out. What are the pros and cons of running the experiments? What are the costs of running the experiments? And if one were going to run the experiments, what's the best experiment one could run at the lowest cost? Then we could actually have a full discussion on this topic, because I think it's a very relevant issue. Thank you, Madam Chair.

CHAIR YELLEN. President Lacker.

MR. LACKER. Yes. Thank you for responding, Vice Chairman Dudley. I think we decided that we would phase it out if it's no longer needed. It strikes me as inconsistent with the spirit of that decision to not take any steps to find out if it's needed. And it strikes me that it wouldn't be that hard to do. If we raised rates, if we raised the IOER rate a quarter point, like Eric said, raised the ON RRP rate 20 basis points, a 5 basis point increase in the spread, and the RRP rates stayed where they are in relation to IOER, we'd be able to say, "Look, we're done," and volume went down—that could easily happen.

VICE CHAIRMAN DUDLEY. I'm not arguing against running the experiment.

MR. LACKER. I misunderstood you.

VICE CHAIRMAN DUDLEY. But we first have to answer the question, what is the experiment generating in terms of information? And will that information change your behavior in terms of how you use it? If you decide that the cost of the experiment is high and it's unlikely to change how you run the facilities, then it's probably not worth running the experiment. It might be if you decide that the cost to run the experiment is pretty low—in other words, that the staff can come up with a way of doing the experiment that's not really hard to communicate to markets, and we don't confuse people about what our intentions are or about how we're ranking monetary control versus footprint versus financial stability. That's all I'm saying. I'm not arguing against running the experiment. I think we also need to think about the question, what are you going to gain from running the experiment, and how is it going to affect your behavior?

MR. LACKER. Madam Chair, those are perfectly sensible principles. I totally agree. What's at stake here is whether we have a facility or not. What's at stake here is a couple hundred billion dollars of money market fund allocations and where they go—whether they go to

us or somewhere else. I think that suggests that the stakes are quite enough to motivate some experiments. I join you in urging the staff to bring us some plans for experimentation.

CHAIR YELLEN. Okay. I think we've had a very good round of comment and discussion. Let me join others in thanking the staff, first, for flawless execution of liftoff and, second, for an excellent memo. I think we've had a rich discussion. As usual, we'll go off and contemplate what the appropriate next steps or options might be. I think there is some degree of agreement—obviously not complete—but, as in the past, my guess is, we'll go back and try to narrow options and respond to what we've heard and try to work our way forward to a decision about how to proceed. I suggest we take a break.

MR. FISCHER. Do we need to ratify the open market operations?

CHAIR YELLEN. Oh, I'm sorry. We do. Thank you very much. I appreciate that. Before we break, we need to ratify open market operations. Can I have a motion?

MR. FISCHER. So moved.

CHAIR YELLEN. Thank you. Without objection. Okay. Let's take a 20-minute break.

[Coffee break]

CHAIR YELLEN. Let's resume. Brian has something for you.

MR. MADIGAN. Thank you, Madam Chair. I apologize, but I misstated the name of the person proposed as associate economist by Vice Chairman Dudley. The individual that Vice Chairman Dudley proposes is Jonathan McCarthy rather than James McAndrews. Again, I apologize for this error. I think the Chair would like to call for a vote on this nomination.

CHAIR YELLEN. Yes. Do I have a motion?

MR. FISCHER. So moved.

CHAIR YELLEN. Thank you. And I assume without objection. Okay. Now let's move on to our briefings on the "Economic and Financial Situation," and today we're going to start with Steve Kamin.

MR. KAMIN.⁴ Thank you, Chair Yellen. I will be referring to the materials titled "Material for the International Outlook."

As Simon has discussed, this is the second time in six months that concerns about a steep devaluation of the Chinese renminbi and related fears of a hard landing in China have roiled international markets. Admittedly, finding anything comforting to say about the world economy right now is as challenging as finding a carton of milk or loaf of bread in a local grocery store. But nevertheless, as in September, our sense is that, in an environment of fragile global economic growth and pronounced anxieties about deflationary pressures, investors are being driven more by heightened concerns about downside risks than by tangible evidence of a sharp deterioration in the baseline outlook.

To begin with, incoming data since your previous meeting do not suggest any steep falloff in Chinese output. As indicated by the solid red line in panel 1, GDP growth stayed strong at 7 percent in the fourth quarter, higher than our December projection. The announced figure was very much in line with our nowcasting model, the blue line, which predicts Chinese GDP using data on contemporaneous industrial production, retail sales, and imports. All told, we see no evidence that Chinese GDP is slowing more precipitously than official figures would suggest, and our baseline forecast remains one of only gradually slowing growth—in line with slowing potential output—in the years to come. Later in my remarks, I will return to the question of downside risks to this reasonably benign outlook.

The future path of the renminbi is, frankly, a more difficult issue. The authorities are struggling to achieve multiple objectives: (1) containing appreciation of the trade-weighted renminbi that would accompany a further rise in the dollar; (2) preventing a large, disorderly depreciation of the currency; (3) maintaining reserves amid strengthening capital outflows; and (4) giving market forces a greater role in the foreign exchange market. The mutual inconsistency of some of these goals, plus the failure of the Chinese authorities to articulate clearly their strategy and objectives, has confused markets. Accordingly, when the PBOC allowed the currency to depreciate at a faster pace at the start of the year, investors took this as a sign that a much larger depreciation might be in the offing. We believe that the current level of the renminbi is not fundamentally overvalued, but that downward pressures on the currency will continue as long as investors worry that the economy is falling into recession and that the authorities will allow—or even welcome—substantial further depreciation. Accordingly, as indicated in panel 2, we are assuming that the renminbi will depreciate a little further—both against the dollar and the authorities' own announced

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

basket of currencies, the multilateral index shown in red—through the middle of the year. By that time, assuming that our forecast materializes that there will be still-solid Chinese growth, capital outflows should settle down and the currency stabilize. However, more bumps on this road are likely, and again, as I will discuss momentarily, more extreme outcomes are certainly possible.

Besides concerns about China, the further steep plunge in oil prices shown in panel 3 has also roiled global financial markets. Part of that plunge was itself a reaction to the concerns about global demand triggered by the events in China, but we believe supply factors accounted for the lion's share of the decline. Estimates of U.S. crude oil production came in stronger than expected, inventories continued to build, and sanctions against Iran that had restrained its oil exports were finally removed.

Accordingly, we do not see the most recent plunge in oil prices as reflecting a sharp downgrade in global prospects. Even so, the decline in oil prices does affect the outlook. Ultimately, that decline should be a slight positive for the global economy, as income is transferred from oil-producing to oil-consuming countries that traditionally have a higher propensity to spend out of income. But it appears to take considerable time for lower energy prices to boost consumption, whereas the hit to investment in the energy sector materializes more quickly. Accordingly, over the next few quarters, the drag arising from falling oil prices on net oil exporters—the bottom set of bars in panel 4—should exceed the boost to net oil importers. This should lower aggregate foreign growth, as some of the oil exporters, such as Canada and Mexico, have much higher trade weights in our foreign GDP aggregate than the oil importers. Moreover, even net oil importers may experience some drag if, like the United States, they have oil sectors of their own.

One question we have grappled with recently is whether the current low level of oil prices alters their economic effects. In regard to the magnitude of the effect of falling oil prices on the energy sector, we remain uncertain. On the one hand, if oil prices are reaching thresholds at which production and investment are unprofitable, this could cause disproportionately large declines in energy investment. On the other hand, these thresholds are very uncertain and oil prices may already have fallen through them. It is worth noting that in the United States, drilling and mining have already fallen by half, so the scope for further declines is limited, no matter how low oil prices go.

In other respects, however, it seems likely that as oil prices hit very low levels, the effects of their decline will prove more injurious. For countries that are especially reliant on oil revenues, such as Russia and Saudi Arabia, budgets are becoming so stretched that sharp cutbacks in consumption seem unavoidable. Very low oil prices may also damage the balance sheets of oil-producing companies and oil-reliant governments and thus make bankruptcies and defaults more likely.

Panel 5 shows our projection for foreign economic growth, taking developments in China, oil prices, and global financial markets into account. Growth in the fourth quarter fell a bit below our December Tealbook estimate, largely because Canadian

growth stalled in the face of drag due to prior declines in oil prices. For this quarter and next, we revised down the pace of expansion in Canada and other commodity producers in light of the further fall in commodity prices this year; Mexican economic growth promises to be a little softer as well, reflecting the weaker path for U.S. manufacturing. Even so, we see foreign activity accelerating from here on out, reaching its trend pace of near 3 percent—the same as we wrote down in December—by the second half of the year. Canadian growth recovers from its oil-induced slump; lackluster growth in the euro-area firms, supported by low energy costs; and Brazil's economy finally bottoms out.

Our relatively limited markdown of the foreign outlook for the next couple of quarters might seem inconsistent with the further easing of monetary policy expected in Canada, the euro area, and Japan, as described by Simon, along with a likely postponement of liftoff in the United Kingdom. However, with the exception of Canada, those easings appear to be motivated less by a weakening of their economies and more by further declines in inflation and inflation expectations, in part triggered by the recent plunge in oil prices, as well as by concerns about downside risks to the global outlook.

Accordingly, assuming foreign growth does return to trend as expected, we believe it likely that the broad real dollar—the solid black line in panel 6—will stabilize as well. That said, our forecast path for the dollar now averages almost 3½ percent above its level in the December Tealbook. Most of that revision reflects the rise in the dollar over the intermeeting period, but some additional appreciation of the dollar against the renminbi and other Asian currencies that we are now assuming also boosts the dollar's path.

Incorporating our revisions to the dollar and the outlook for foreign GDP growth since the December Tealbook, we now project a slightly greater drag arising from net exports on U.S. GDP over most of the forecast period and a slightly greater drag of core import prices on U.S. inflation. But as I noted earlier, the fluctuations in global financial markets this year likely reflected concerns about extreme downside risks. One prominent such risk, drawn from the January Tealbook and summarized in the top panel of your next exhibit, is that China's economy experiences a hard landing that spills over to other EMEs and causes sharp disruptions in global markets. Considering China's substantial economic and financial imbalances, as well as its increasing weight in the global economy, this scenario is hardly far-fetched. But even so, we have calibrated the shock to be very severe: GDP in China and other EMEs falls 7 percent below baseline—similar to during the Asia crisis; the dollar rises 15 percent, more than it did during the Asian crisis; and U.S. corporate credit spreads, which in the 1980s and 1990s generally had been relatively impervious to EME crises, widen by 100 basis points. Accordingly, we view this scenario as a tail risk rather than a likely alternative to our baseline outlook. In the event, as evidenced by the red lines in the panels below, U.S. GDP growth falls below 1 percent, core inflation falls to ¼ percent, and the federal funds rate moves back toward zero.

In the January Tealbook, we featured a second external downside risk to the U.S. economy that we would regard as having a greater probability of coming to pass than a hard landing in China. As shown in the top panel, foreign real GDP growth comes in just $\frac{1}{2}$ percentage point below expectations—hardly a crisis, but enough to unnerve investors further, pushing the dollar up another 10 percent and oil prices down a further \$7 per barrel. As indicated by the blue lines below, the rise in the dollar pushes U.S. real GDP growth down $\frac{1}{2}$ percentage point while both the movements in the dollar and oil prices further delay the return of inflation toward target. The federal funds rate still rises, but at a slower pace. David will now continue our presentation.

MR. WILCOX.⁵ I will be referring to the packet titled “The U.S. Outlook.”

Despite the recent turmoil in financial markets and some increase in the turmoil in my own stomach, our baseline outlook for real activity is only a little weaker than it was in December. I will spend the bulk of my remarks laying out the reasons behind this outcome. Along the way, I will also note that we continue to assess the risks to our outlook for real activity as weighted to the downside, and a little more so now than six weeks ago.

Starting with some of the bad news, the recent indicators of spending and production have mostly been disappointing. Panel 1 at the top of your first exhibit shows the evolution of several forecasts of real GDP growth in the fourth quarter of last year. The horizontal axis shows the date when a forecast was generated. The forecasts shown here include the Board staff’s judgmental forecast as of each Tealbook closing date, as well as various model-based nowcasts generated at the Board and elsewhere in the System. As you can see from the black line, over the past few months the Board staff has successively lowered our estimate of fourth-quarter growth to the point at which it now stands at just $\frac{1}{2}$ percent. Nowcasts from our dynamic factor model—the red line—have also drifted lower on net. That said, uncertainty about what happened last quarter is still substantial as portrayed both by the dispersion in views across models maintained by staff around the Reserve Banks—which are portrayed by the blue dashed lines—as well as by the shaded region, which gives a 70 percent confidence interval around the estimate in the Board staff’s factor model. For us on the judgmental staff at the Board, the negative surprise since the time of your December meeting has been about equally split between inventory investment and final sales.

At this point, hard evidence about first-quarter real GDP growth is sparse but, as you can see from the black line in panel 2, we do not think that last quarter’s pronounced weakness will persist, partly because non-energy inventories look to be in reasonable alignment with sales, and so inventory investment is not likely to continue declining rapidly. That said, the various nowcasting models can support a wide range of views about what might be going on in the first quarter.

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

Our judgment about the current state of the economy was heavily influenced by the strength of the December jobs report. As I have mentioned before, we have been working on an ambitious program to develop a comprehensive method for combining the signal from spending, production, and labor market indicators to infer a summary measure of the economy's cyclical position. In panel 3, I show the cyclical indicator—essentially, an estimate of the output gap—that emerges from one model-based version of this idea. The solid black line gives the estimated cyclical indicator, taking as given what we now know about such variables as the unemployment rate and payroll employment in the fourth quarter, along with our latest estimate of GDP growth in that quarter. The red dashed line was constructed on the basis only of data through the third quarter and is meant to approximate what we would have estimated on the basis of the official quarterly data that were available to us at the time of your December meeting. As you can see, the estimated cyclical position of the economy in the fourth quarter in this version of the model is completely unaffected by the addition of the fourth-quarter values. One interpretation of what is going on is that the model is writing off much of the weak GDP information as statistical noise and instead is putting substantial weight on the strong recent labor market data, leaving the estimated cyclical indicator unrevised. We did the same thing in the judgmental forecast albeit to a lesser degree: Of the total signal for the output gap that we might have taken from the weak trajectory of real GDP growth in the fourth quarter, we took on board half and absorbed the other half by marking down once again our estimate of potential GDP growth in 2015—in effect, using potential GDP as a temporary parking lot for observation error until we can get a more fully articulated accounting system in place.

Beyond the near term, our outlook for real output growth—shown in panel 4—and the unemployment rate—panel 5—is very little changed from our previous forecast. Current and expected financial conditions—particularly the stronger path of the dollar and lower level of equity prices over the projection period—are now less supportive of growth than they were in the December Tealbook, but the effects of these weaker financial assumptions are partly offset by the net impetus from lower oil prices. In addition, legislation regarding some federal tax policies that the Congress passed last month implies a stance of federal fiscal policy that is slightly more expansionary than what we had penciled in at the time of our December forecast.

Naturally, views will differ about whether our assessment of the underlying state of the economy is correct, and having been raised at a dinner table at which a lawyer's adversarial mindset was the norm, I thought I would take a crack at sketching the case I would assemble if I were, alternatively, more pessimistically minded or more optimistic than in the baseline.

A more downbeat assessment of the outlook for real activity could start with the observation that December's retail sales report was quite weak, following a stronger-than-expected reading in November. In the baseline, we took the view that this monthly pattern may reflect a shift toward an earlier holiday shopping season, but it could instead reflect a more fundamental weakening late last year in households' inclination to spend. Perhaps bolstering that view, while motor vehicle sales were

still at a high level in December, they were not as high as we had expected, and a skeptic might be especially attentive to durable goods spending as a relatively sensitive harbinger of cyclical weakening. Moreover, indicators of activity in the industrial sector—including the various regional surveys—have continued to be downbeat. Although the industrial sector seems to have been particularly hard-hit by the stronger dollar and the reduction in oil drilling activity, industrial activity has been sluggish, even leaving those factors aside. In the labor market, while initial claims remain low by historical standards, they have drifted up some since late last year. Finally, we could be underestimating the adverse implications of the recent tightening in financial conditions. Our baseline incorporates all of the conventional channels—for example, the effect of lower equity wealth on household spending and the effect of a stronger dollar on net exports. But we have not allowed for any additional contribution operating through household or business confidence or disruptions of financial intermediation, nor have we assumed that financial market conditions will worsen materially, nor did we take the recent adverse financial news as an indication that market participants know something we do not know about economic prospects. Thomas will report on some models that key off of financial variables and point to an elevated risk of recession in coming quarters.

On the other hand, one could also find reasons to be more optimistic than our baseline. Most notably—as I mentioned earlier—the December labor market report was quite good: Job gains over the fourth quarter are now estimated to have averaged 285,000 per month, and the employment-to-population ratio ticked up last month as the participation rate edged higher. In the past several years, this has been a consistent pattern: Labor market improvements have chugged along at a steady pace, and disappointing news about GDP growth has been an indication that we needed to downgrade further our assessment of aggregate supply conditions. That is not great news for the living standards of future generations, but thus far it has not meant that cyclical weakness was just around the corner. In addition, the news coming from the household sector has not been all bleak: The Michigan measure of consumer sentiment remained at a pretty high level in early January, and the slow-but-steady recovery in housing construction still seems to be in place. As a partial counterpoint to the estimates of an elevated risk of recession six months hence, I would point to other models suggesting that the probability that the economy was in recession last month was much lower than normal. Moreover, if I were prosecuting the optimistic case, I would note that we still do not really know what went on during the fourth quarter of last year with regard to GDP: Even after the BEA publishes its first estimate of growth in the fourth quarter—which we will all take, in our weaker moments, as an announcement of the true outcome—the 70 percent confidence interval around that estimate will be wider than 3 percentage points. In other words, even if the BEA validates our current guess that real GDP inched up only $\frac{1}{2}$ percent at an annual rate last quarter, there would be a 15 percent chance that the actual growth rate last quarter was around 2 percent or better. Of course, the pessimist could reply that the uncertainty is two-sided, and that a decline of 1 percent or more is just as good a guess, but in light of the recent track record of the GDP data, I think the optimist would have the better side of this particular point.

The middle course that we have taken in the baseline tries to strike a balance between these two views, and I am mildly encouraged that our state-space model would have had us go even a little further in discounting the weak GDP data.

Downside risks are certainly very much in vogue these days. Although picking a favorite downside risk would feel a little like having to name which is my favorite child and acknowledging the salience of the risks Steve has discussed, I would also put in a word for the scenario titled “Financial Turbulence” in the “Risks and Uncertainty” section of the Tealbook. In that scenario, we used a model developed by colleagues at FRB New York to wrestle with the potential economic implications of a significant further deterioration in financial conditions. The beauty of the New York model is that it represents one of the few serious attempts to build in a richer interaction between the financial sector and real activity. If we assume a substantial and sustained additional widening in credit risk spreads compared with the baseline, then this model does predict a mild recession during the first half of this year.

Panels 6 and 7 summarize the inflation outlook. I do not have much to report here, mostly because not enough time has passed yet since the December meeting to prove us very wrong. As you can see from panel 6, we have lowered our near-term projection for headline PCE inflation, largely because of the lower path of crude oil prices now anticipated by futures markets and by us. And panel 7 shows that our near-term forecast of core PCE inflation is a little lower than in the December Tealbook, mainly because the projected path for core import prices has been revised down. Beyond the near term, though, our inflation projection is about unchanged from our previous forecast.

In the statement that you released at the conclusion of your December meeting, you cited reasonable confidence that inflation would move up to your 2 percent objective as one of the rationales for raising the funds rate by a notch. To aid in the task of monitoring progress toward that objective, we intend to introduce in the March Tealbook a set of inflation-focused exhibits similar to the ones we used following your September 2012 meeting to track whether the substantial further improvement in labor market conditions was being achieved. Panels 8 and 9 preview two of the exhibits that we intend to use. These two panels will decompose the cumulative revisions that we make to our inflation projection from our forecast in the December 2015 Tealbook. As you can see from panel 8, we have revised down our forecast regarding top-line PCE inflation this year by nearly $\frac{1}{2}$ percentage point thus far, mostly because of the further downward move in energy prices. And as shown in panel 9, the cumulative revisions to our forecast of core PCE inflation are, not surprisingly, very small thus far and almost entirely attributable to readily identifiable factors—namely, the level of resource utilization and the pass-through of energy and import prices into core inflation.

Finally, the next page updates the “Lockhart dashboard,” which summarizes the timeline of when some key indicators will become available to you at the next few FOMC meetings. The data that will first be available at the March meeting are in the gold-shaded region, the additional observations that will become available in time for

the April meeting are shaded in red, and data that will be available at the June meeting lie yet further to the right. We expect that headline inflation will continue to run at a low level through the first part of this year—with some further negative readings on a three-month change basis—as low oil prices depress consumer energy prices, and on our reckoning, core inflation will remain below 1½ percent. As for real activity, we expect that the labor market will keep generating solid job gains and an unemployment rate moving just below 5 percent despite the sluggish pace of GDP growth. Nellie will continue.

MS. LIANG.⁶ Thank you, David. I will be referring to the materials called “Financial Stability Developments.”

Since the last financial stability briefing in October, the U.S. financial system continued to be buffeted by some large shocks, mainly related to lower oil prices and developments in China. Risk premiums for many U.S. assets have widened, but the domestic financial system appears not to have amplified them with forced asset sales or stresses at large financial firms. The system’s resiliency likely reflects limited exposures and high capital in the banking system, and a gradual modest decline in leverage and less stable funding more broadly in recent quarters. However, bigger shocks, such as a sharper slowing of global growth mentioned by Steve and David, would increase the risk of larger amplification effects.

On the first exhibit: As Simon noted in his briefing, spreads on speculative-grade corporate bonds have risen sharply for many sectors, not just for oil firms. Moreover, spreads have risen by more than required to compensate for higher expected defaults, suggesting risk premiums also have risen significantly. One illustration of the rise in risk premiums is the increase in far-forward spreads of about 150 basis points since mid-2014, when oil prices started to fall. We interpret these changes to reflect changes in risk sentiment as investors likely are not revising their outlook for defaults at that horizon. The larger increase in near-term spreads of closer to 300 basis points is more plausibly driven by both higher expected defaults and higher risk premiums.

This rise in expected defaults stems partly from the increased leverage of speculative-grade corporations. Debt has been growing rapidly for the lower-rated segment of the corporate sector, and as shown by the blue line in the top right, the debt-to-asset ratio for speculative-grade non-oil corporations has increased to a near multidecade high and has jumped recently at oil firms, the red line, as they wrote down the value of their oil reserves. While many of these firms that issued debt in recent years have locked in lower interest rates and extended maturities, we expect some firms will be stressed as firm values fall amid the reversal in risk sentiment, making it more expensive to maintain or get new financing.

Falling prices for speculative-grade bonds have been accompanied by sizable outflows at mutual funds in recent months (shown in the middle-left chart). Large redemptions for more than a year at a small high-yield mutual fund led that fund to

⁶ The materials used by Ms. Liang are appended to this transcript (appendix 6).

suspend redemptions in December, an action that surprised investors. This event highlights the tension between the offer of daily redemptions to investors and the growth of funds concentrated in less liquid assets.

We have not seen evidence of disproportionate outflows at other bond funds as a result. We also did not see evidence of strains in market functioning at the time in the speculative-grade corporate bond market (shown to the right). As shown in that panel, bid-ask spreads (the blue line) and average trading volumes (the black line) stayed in their normal ranges. Nonetheless, it seems quite possible that the surprise closure raised the risk of preemptive outflows in the future and forced asset sales. The SEC proposed rules last September to improve liquidity risk management and investor disclosures at these mutual funds, and the Financial Stability Oversight Council is assessing whether potential systemic risks arising from liquidity mismatch are being addressed.

An adverse dynamic of wider risk premiums that could have broader consequences should be limited by the modest exposures and strong capital positions of banking firms. Although LISCC firms naturally have significant exposures to the corporate sector, as noted in the bottom-left panel, exposures to oil firms are not large. The more significant concerns arising from lower oil prices would be for community banks or some regional banks in some areas of the country. In addition, LISCC bank exposures to China, Hong Kong, and other EMEs are limited, although indirect exposures through other global banking firms could be a concern if EME troubles intensify. These potential risks are not a complete surprise: Last year's stress-test scenarios featured wider corporate spreads and weak foreign growth, and they will remain features of this year's scenarios, which will be released later this week.

Leverage in other parts of the financial system is more difficult to assess, but it does not appear unusually high and may be falling modestly. Leverage at hedge funds measured based on margin credit may have turned down after the sharp jump in stock price volatility in August and the related margin calls, and more dealers reported in SCOOS in December that they had tightened somewhat the terms for securities financing and derivatives for their hedge fund clients. In terms of oil positions, and as shown in the bottom right, the CME started to raise margins for oil futures last fall and have maintained margins at a relatively high level as price volatility has stayed high. The staff views current margins to be conservative, on the basis of an estimated probability being low that a futures price change would exceed current margin levels. Conservative margins reduce the prospect of a near-term increase that could trigger further price declines.

Exhibit 2 summarizes a broader view of financial vulnerabilities. The table focuses on four categories of financial vulnerabilities, listed in the first column. The current assessments for the categories, shown in the last column, are mostly "yellow," which means we view vulnerabilities to shocks from any sources to be in the moderate range. The staff judgments regarding the categories and overall are based

on both a cyclical assessment of indicators as assessed against metrics of roughly the past 30 years as well as structural problems not captured well by time-series data.

I do not plan to talk through each line of the table but will highlight a few points. For asset valuation pressures, we currently view them to be moderate, a step-down from the notable level in recent assessments. As mentioned, risk spreads for corporate bonds widened materially and are now well above average, and low-rated, low-quality issuance has been abating. In addition, the decline in stock prices has brought forward price-to-earnings ratios down, but they are above their median level of recent decades. However, cap rates for commercial real estate through December indicate required returns continued to move down and are very close to or near levels near their previous boom in 2007. Although cap rates may be supported by low interest rates and lending terms and standards recently appear to be tightening, the continued rapid rise in prices suggests this sector warrants continued attention.

In the next category, private nonfinancial sector leverage, an increase to record-high debt ratios in the business sector led us to raise the assessment early last year from green to yellow. Although the business sector on its own might warrant a higher level, household borrowing has been very subdued, and the total private nonfinancial credit-to-GDP ratio in relation to its long-run trend is at a very low level.

In the financial sector, vulnerabilities arising from leverage are viewed to be low (shown by green), though a notch higher than the blue subdued level that would be suggested by the time-series data. Bank capital ratios are at their highest in decades, but ratios have been rising as capital has turned out to have been inadequate many times for the risks of the financial system.

In maturity and liquidity transformation, vulnerabilities also are viewed as moderate, reflecting the fact that while cyclical vulnerabilities are low, structural reforms are still incomplete. Short-term nondeposit liabilities have declined sharply in recent years and are low, especially adjusted for an upward trend. On the structural side, the money fund reforms to address run risk are still to be implemented, as discussed earlier, and some parts of the repo and sec lending markets are very opaque. Liquidity transformation has increased, and, as noted earlier, there is work supporting reforms for mutual funds.

Finally, I would note that this assessment that financial vulnerabilities overall are moderate was an input into the Board's decision in December to affirm the level of the countercyclical capital buffer at zero. The Board at the same time issued a proposal for comments on the framework for determining the level of the countercyclical capital buffer. That concludes our remarks, and we would be happy to answer your questions.

CHAIR YELLEN. President Kashkari.

MR. KASHKARI. Two quick questions. David, on your inflation revisions, forgive me, what's the takeaway from panel 9? How do we look at this, and how do we use it?

MR. WILCOX. 8 and 9 are components of an inflation monitor that we intend to introduce in the March Tealbook. The first page of those exhibits is just going to show the evolution of our inflation forecasts from one Tealbook to the next and will overlay each successive forecast on top, so that if our forecast begins to drift away from what we had envisioned at the time of the December 2015 Tealbook, that will be completely evident.

And 8 and 9 will look at the cumulative revision in the inflation forecast, putting a stake in the ground at the December 2015 Tealbook. What they'll do is decompose in the left-hand panel the projection for top-line PCE inflation and in the right-hand panel the projection for core PCE inflation. The decomposition in the left-hand panel is just arithmetic. All it does is take the top-line PCE price index and decompose our forecast error into the main categories that are listed there: food, energy, and core. In some sense, there's no analytical content there. It's just relative importance weights and an arithmetic exercise of how much each component departed from our forecast.

There is some economic content in the panel on the right-hand side because that's based on rules of thumb that our sector analysts use, which in turn themselves are informed by model-based estimates. What we're trying to do is trace through the importance of changes in each of these factors for the projected behavior of core inflation. The idea there in the right-hand panel is that what we'll do is attempt to trace back revisions in our core PCE inflation forecast to one-level-more fundamental sources. I'm sure that interpretations around the table will differ, probably in 19 different ways at least. That will double-count—

MR. TARULLO. But there are only 17 of us.

MR. WILCOX. —two of you. I was onto that. At least two of you will have different views. [Laughter]

One possible interpretation of this decomposition might be that if we're able to trace the cumulative revision in our inflation forecast back to easily identifiable, earlier sources, like energy prices, the dollar feeding through import prices, or the pressure on economic activity—that is, the Phillips curve at work—that might not reveal any extent to which we've lost our handle on how the inflation mechanism is working, because those would be identifiable factors that we would understand the economic mechanism that's at work.

Now, there's an "other" category, because it's not going to work out in so tidy a manner. At the moment, this "other" category is barely discernible, as we've only had one reading on the PCE monthly price index and one reading on the CPI since last time, but over time the "other" category will emerge, either to the upside or the downside. My hope is that it will provide an interesting vehicle for discussion and analysis as to what's going on, what the underlying story might be. That's the goal of this.

The last piece of this inflation monitor will just be a panel—currently page 27 in your data sheets—that provides a roundup of a whole bunch of different measures of longer-term inflation expectations, which play a pretty key role in our inflation analysis. If those begin to drift one direction or the other, that's something that would capture our attention.

MR. KASHKARI. The second quick question I had—maybe for David or Nellie, I'm not sure—is that in the risk scenarios I found it hard to reconcile that the China hard-landing scenario did not yield a recession, but the financial market turbulence did yield a recession. It struck me that a China hard landing would trigger financial market instability, and if that's really

what's going to trigger a recession, China could well be it. I'm just curious if I'm off in how I'm thinking about it, or if the staff would think differently.

MR. KAMIN. Let me start, because the international side was responsible for that part of the scenarios. If you look at exhibit 2 of your international outlook materials, the red line in panel 5, which is U.S. GDP, falls on a four-quarter change basis to ½ percent. I don't have the actual quarterly numbers on me, but I'm pretty darn sure that that means a quarter or two of negative changes in real GDP. In that sense, it probably is associated with at least a mild recession. Just to compare that scenario with the financial turbulence scenario, in the China hard-landing scenario, the negative effects on the U.S. economy come mainly through trade channels—the rise in the dollar and the decline in foreign GDP. Those have a very important and material effect on the U.S. economy, but all that being said, because the U.S. economy is not as open to international trade as other economies, the effect is not so great. The China hard-landing scenario does also incorporate the disruptions to U.S. markets that do depress GDP, but obviously not as much as the financial turbulence scenario. I'll now pass the baton to my colleagues here.

MR. WILCOX. I would only add, I think we could probably easily, in some sense, concatenate the two scenarios and get something that's more severe to the downside from the combination of both of the factors. And I think it's realistic to envision that the kind of financial turbulence that we have in that scenario would result from the China scenario.

MR. EVANS. And that's a pretty common type of additional exercise that you do with these, right, when you're looking for an extra kick from spillovers.

MS. LIANG. I'll add one more point. When we were looking at the financial linkages between the United States and China, and the EMEs, most of the linkages are economic—trade

and the dollar—so that’s where the biggest linkages in the scenario are, as you would expect.

The linkages between the financial institutions in the United States and China and the EMEs are pretty limited. Your first scenario would not entail a lot of distress in the U.S. financial markets from this, but, clearly, that could be added.

CHAIR YELLEN. President Lacker, did you have a two-hander?

MR. LACKER. Yes, it was a two-hander. Because it appears as if charts like number 9 might make more visits to the Committee, I wanted to follow up on President Kashkari’s question and ask something that I’ve wanted to ask you for a while. You have apportioned this: resource utilization, energy prices, and import prices. In our standard models, we often think of monetary policy as related to inflation. In fact, in the standard textbook models, an impulse from monetary policy affects both prices and, to the extent that there are monetary nonneutralities or something that gives rise to the Phillips curve, simultaneously real activity and real resource utilization. I’m wondering how you want us to think about attributing inflation to resource utilization, when in the standard models it’s just a correlate of inflation. We usually think about it in terms of monetary impulses affecting both—sometimes not real things, sometimes real things. Is that clear? Do you understand the question? It’s a puzzle, more or less.

MR. WILCOX. Well, this is quite a standard New Keynesian Phillips curve kind of framework. Monetary policy is relevant because it influences the thrust of aggregate demand, and that influences, in turn, the level of resource utilization. As well, monetary policy operates very importantly on inflation through the exchange rate and setting the terms of trade. So monetary policy is very much present here through two different channels: One is the thrust of economic activity, and the other is the import price channel. Now, I don’t know what else I can say. I’m looking back to Dave Reifschneider. What would you add to that?

MR. REIFSCHEIDER. I'd add two things. One, there's a third channel—expectations.

MR. WILCOX. Yes. Right.

MR. REIFSCHEIDER. I would say your point is correct, in that some of the explanatory variables for inflation—say, resource utilization or marginal costs or something like that—are determined by monetary policy, but they're determined by many other things as well. And the accounting exercise that David was talking about isn't trying to take everything back to every single ultimate cause, which would include what's up with Chinese economic growth, what the European Central Bank's monetary policy is, and yada, yada, yada. It's stopping at an earlier point than that. Yes, it's stopping at an earlier point, and it's using some things that are clearly endogenous, like slack. But in the accounting mechanisms, in the New Keynesian Phillips curve, they are direct drivers of inflation.

MR. LACKER. So the puzzle is that this makes it seem as if it's the case that if monetary policy did not affect real activity, it wouldn't affect inflation, whereas in our models, that's a case in which it does affect inflation. That's the puzzle for me.

VICE CHAIRMAN DUDLEY. There's still the inflation expectations channel, right?

MR. LACKER. Forget expectations. In the standard model, if the Phillips curve is vertical, it affects inflation, even though it doesn't affect real activity.

CHAIR YELLEN. There's an aggregate supply relationship in there, which is this Phillips curve mechanism between the level of utilization and inflation. And according to their estimates, that relationship, at least at the moment, is, and has been, quite flat. But in the world you're talking about, the relationship could be quite steep. The influence of utilization on inflation could be, in some world, very large, in which case monetary policy, when you incorporate that into a model, would mainly raise inflation and have very little effect on

utilization. That would be a vertical Phillips curve. That's not in any way the estimates that you are basing this on, but it could be, so I don't think there's any conceptual puzzle here.

MR. WILCOX. I don't think so.

CHAIR YELLEN. President Evans.

MR. EVANS. I think it's a two-hander, because at least it's on the same dashboard topic. But another factor that could show up here—you mentioned the inflation expectations table, but, presumably, one thing that's underlying this is, you've got your price-inflation Phillips curve with the additional transitory variables that show up here and other things. But you've also got the inflation attractor, if I understand that right. So part of the forecast, the last time I remember looking at it, was, you've got that at something like 1.8 percent, and it's expected to go up at some point, possibly within the forecast horizon.

MR. WILCOX. Beginning of 2018.

MR. EVANS. So if that doesn't happen, that would show up as one of these yellow factors?

MR. WILCOX. That's right.

MR. EVANS. Okay. So to the extent that the yellow all of a sudden gets big, it is like other things are at work, and we might be behind.

MR. WILCOX. Right. So if the yellow region begins to emerge, what we would do at that point is caucus among ourselves—

VICE CHAIRMAN DUDLEY. Break out the yellow region.

MR. WILCOX. —engage in some analysis of the yellow region and see whether we had some readily attributable underlying factors there, or come back to the Committee and say, “Gee, we don't know. There is something at work in the inflation mechanism that we can't square with

our analytical framework.” Now, there will be a lot of different analytical frameworks brought to the table. And so what might be of concern in our framework might be understandable in others, but the goal here is to try to provide one metric where, applying our pretty mechanical rules of thumb, you’ll be able to keep score at home and see whether things are drifting away from the narrative that we had in place as of the time of the December 2015 projection.

MR. EVANS. Thank you.

CHAIR YELLEN. Further questions? President Bullard.

MR. BULLARD. Thank you, Madam Chair. I just had a question about the jobs numbers on the Key Economic Indicators exhibit. I guess you penciled in 238,000 for the three months in the first quarter of 2016 for nonfarm payrolls, and I notice the Tealbook had the year averaging more than 200,000. I just wonder if I could get you to talk a little bit about where the risks on that part of the forecast are. It seems high to me, but I’m willing to listen to explanations. I think we’ve been telling a story that we expect job growth to slow down, but this really sounds like it’s still going to be a banner year in 2016. I guess that’s my general feeling.

MR. WASCHER. We’re basically taking some signal from 2015. The strong job growth and the modest pace of GDP growth has been a feature of the economy for a while, and we have those trends extending into 2016, particularly in the first half of the year. And then over the second half, we have monthly employment increases slowing down to about 160,000 or so. So, yes, it’s still good job growth with moderate GDP growth. Again, that’s what we’ve been seeing.

Now, I suppose I can see risks on both sides. We’ve underpredicted job growth in the past, and so that might argue for a higher number, not a slowdown. On the other hand, with the modest pace of GDP growth, and if you felt productivity was going to pick up toward a faster

trend, you might expect a sharper slowing in job growth. So I guess we view this as relatively balanced, a view reflected in our forecast of GDP growth. The other risk I would note is that we see the balance of risks for real activity as weighted to the downside, and that might argue for thinking about the risk to employment growth as weighted to the downside. But in view of our path for GDP growth, I think the risks of our employment forecasts seem reasonably balanced to me.

CHAIR YELLEN. President Lockhart.

MR. LOCKHART. Thank you, Madam Chair. This is a financial stability question for Nellie. One thing that has gotten my attention recently are media reports and commentary linking global equity market declines to the selling activity of sovereign wealth funds, particularly the sovereign wealth funds of oil- and gas-producing countries. After looking into the issue, there seems to be some evidence for a reduction in holdings in foreign assets, but it seems much more difficult to determine if these reductions could be directly contributing to the declines in equity markets or indirectly influencing a risk-off environment by large investors more broadly. So my question is, has the staff done any work on, or given any thought to, the potential role of sovereign wealth funds in the recent equity market declines and, maybe more broadly, the increasing correlation of oil and risk-asset markets—which seems to be a new development?

MS. LIANG. Let me just say a couple things about sovereign wealth funds. It is something we're currently learning more about. I would say that, six months ago, we thought of sovereign wealth funds like endowments: They are private pools of capital. They make investment decisions. They might be big, and so they might affect asset prices, but they're private pools of capital, generally not viewed as leveraged. Market regulators would not be

concerned about sovereign wealth funds. It's not pooled investment funds or investment for others. I think what we're seeing over the past six months to a year is that they aren't really endowments, to the extent that they are parts of oil-producing countries, and the countries are using them to finance their deficits. So, in some sense, they're just a leveraged fund for a country, and to that extent they are of more interest.

MR. LOCKHART. Could make a comment?

MS. LIANG. Yes.

MR. LOCKHART. One commentator, I thought, had a very interesting analysis. He said that we're experiencing an enormous margin call.

MS. LIANG. Yes. That is the exact sentiment I was trying to express. I think the main questions for financial stability are: What kind of liabilities do they have? How short are they? How quickly do they need to meet these obligations? And then the other piece would be, who are the other investors? Are their sales offset by purchases by other investors? So I'm giving you a sense of how we're thinking about it. We don't have any answers to these questions. The international community is very interested in learning more about sovereign wealth funds, but they are a very different kind of "private" financial institution, so the kind of proposals for regulations would be very different. This would be a country.

Globally, they're about \$7 trillion. And just to put that into context, U.S. mutual funds have about \$15 trillion. And I think separately managed accounts—which is the way we've been thinking about them, like pension funds or insurers or endowments—are probably \$9 trillion. So they're a big piece, but they're not the whole piece. We'll probably be giving them a little bit more thought. But that's the state of play right now.

MR. POTTER. They mainly hold U.S. assets.

MS. LIANG. Yes, they like U.S. assets.

MR. KAMIN. If I could just add a couple of points. As Nellie said, it is almost certainly the case that a lot of sovereign wealth funds are very intimately connected with their governments. And so it's quite plausible that over the past year or so, you've seen sales of sovereign wealth funds both to help finance governments that had been reliant on oil revenues and now need more cash and, secondly, perhaps even to basically finance reserve intervention. A lot of times, the line between foreign exchange holdings and sovereign holdings is not very clear cut. So probably both of those factors are at play, although to what extent is a little bit murky. But I would view those as important background factors. And then if you think about what's happened with the plunge in equity prices more recently in the last couple of weeks, that seems to be triggered more by high-profile macroeconomic elements, such as in China. You probably wouldn't want to attribute that to any particular sea change in the portfolio behavior of the sovereign wealth funds themselves.

CHAIR YELLEN. Any further questions? [No response] Okay. Then we have an opportunity for comments on financial stability, and let me start with Governor Fischer.

MR. FISCHER. Thank you, Madam Chair. First, I want to commend the staff that produced both of these reports, "QS Assessment of Financial Stability" and "Financial Stability Implications of 'Low-for-Long' Interest Rates in AFEs." The QS assessment is summarized in the table on exhibit 2, which shows a slight improvement in the overall level of vulnerability due to a decline in valuation pressures in corporate debt markets and equity markets. I think in both those cases, the decline in valuation pressures is a result of external events happening, and I'm not sure that's all good news about what's happened to prices there.

What I found remarkable about these two reports is how much you read about the rest of the world. And this is not the first time the United States banking system has been severely exposed to foreign countries, the debt crisis of the 1980s being an obvious example in which the exposure was very large. It may be the first time that the United States financial system seems to be exposed to other countries. Starting in the morning, you get the Japanese affecting us not that much, then the Chinese in a big way, and then it moves on to Europe affecting us to a greater extent than I recall at earlier stages. And it's very interesting, because it isn't all happening through the banking systems, which it used to. It's happening, to a considerable extent, through equity markets and debt markets. And I find that very interesting. I was just thinking, as I was writing this, that it was only about nine months ago that we first decided we could refer to China being a factor in our thinking about what we ought to do. And now it's coming in massively, and it's a good thing that we're following what's going on there.

The QS report ends with something that I think is very important and that we need to remember as we move ahead. I think the last paragraph says that “because Treasury yields are closely related to discount rates used to value many assets and securities, sudden future increases in longer-term Treasury yields, especially if not related to faster-than-anticipated economic growth, could prompt sharp declines in the prices of many assets that appear fairly valued primarily because of the low term premiums.” And I think that's part of what's happening in the U.S. equity markets as well. We cut the interest rate in order to get asset values up, and we were successful—very successful. Equity markets came through the crisis beautifully. Well, if that all worked, then when we undo the cuts in interest rates, unless the economy has grown a lot since then, and profits are much higher, and firms are much more prosperous, and so on—which hasn't happened—equity prices are going to go down. And in any case, the partial effect of a

rise in short-term interest rates, which also affects longer-term rates, is to reduce equity prices and other asset prices. And we'll have to keep thinking about those facts.

The paper asking about what the longer-term effects are, if any, of low-for-long interest rates in the advanced foreign economies doesn't find much to worry about, or at least to comment on, except for German insurers who have given long-term guarantees of real rates that are no longer available. I think there are some American insurance companies in the same position as well, but you didn't find very much more.

I'm kind of reflecting on the fact that we—and when I say “we,” I mean “I”—have said in many a speech, “Well, we gave them a long time to prepare. We kept warning them.” And then you sort of say, “Well, what did you—or what did we, or what did I—expect them to do after we'd told them that we were going to raise the rates and they could be facing capital outflows?” Well, did we want them to raise rates to keep the money there? I'm not sure what we wanted them to do. Some of them have gone on to use capital controls, which, if we're interested in financial stability, we'd better not rule out if we want financial markets to not be a source of problems for us. And then there are a few—Mexico is an example of one that has simply built a very robust financial system and has been, so far, able to withstand a very large devaluation in part because of its oil dependence, which is not that high.

So what are the lessons? I think that we're in a period in which we're undergoing a shift of regime in the global economy in which we're heading back to the 1970s and 1980s. I think we're going to be less connected. I think there's going to be less foreign lending. We're doing that with the anti-money laundering. We're creating problems at the level of the individual. They may be justified problems, but we're doing it. And the big difference that China made when it was growing fast, at least in terms of the way I thought of this, is we thought for 40 years

or so that the terms of trade would be turning against raw material producers, natural resource producers, forever. Australia was quite used to that assumption. Then all of a sudden China came along and started buying iron, copper, everything, and all of the prices of commodities started rising. And then everybody thought, happy days are here again, and there were massive investments taking place.

And now, unless I'm mistaken, unless India, which is less globally integrated than China decided to become, replaces it—which is possible, but I don't think will happen—we're going to have to get used to a different behavior of that fundamental relationship—namely, the terms of trade between the industrialized world and the developing world. And that will have some implications for financial relationships and may have some implications for financial stability.

So what do we have to do? Well, I think, two things. We have to remember that we don't have a lot of financial stability tools, and that we've got to do this primarily, as Dan keeps emphasizing, I think, through strengthening the structure of our financial system more than through the use of macroprudential tools, which other countries may have more of. And the other thing that I think we have to remember, having watched what has happened in the short period since concerns about China started increasing, is the Warren Buffett warning, "Only when the tide goes out do you discover who is swimming naked." You don't see it until the crisis actually comes. You think about it and you worry about it, but you don't actually know when it's going to come. And then, bang, it shows up. So I like both of these papers, and I think they're very useful warnings to us, particularly the second one. Thank you very much, Madam Chair.

CHAIR YELLEN. Thank you very much. President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. I will be brief, in view of the number of topics we are discussing at this meeting. The QS report notes that commercial real estate prices continued to rise through Q3, as shown in chart 1-10. This continued upward trend in commercial real estate prices, driven by low interest rates and declining vacancy rates, is a scenario we ran in the tabletop exercise. If this trend continues through year-end, rather than simply being a tabletop scenario, we will be looking at a possible commercial real estate bubble in real time. This would seem to be the appropriate time to signal even more forcefully our concerns, through guidance, stress tests, and speeches, that supervisory tools are not sufficient. I may be inclined to use monetary policy tools, perhaps raising the funds rate more rapidly than otherwise would be the case, even though I view that as a second-best solution. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Madam Chair. I just have two comments, briefly. First of all, I just want to emphasize—and we've been talking about this—that the composition of the S&P 500 is today very different than that of the underlying U.S. economy. Approximately 50 percent-plus of the S&P 500 are goods-producing companies, in terms of their profitability, and 40 percent-plus of S&P 500 earnings originate outside the United States. This goods-producing exposure explains why the oil decline last year was enough to cause a decline in S&P earnings last year. And S&P earnings this year, despite this oil wane, are expected to be \$115 to \$120. If you take a 16-times multiple of that, you would get to \$1,840 to \$1,920 on the S&P. And 16, in my career, and if you go through history, is a relatively full multiple. It's sort of in the range. And so, right now, we are at 1,870, which is right in the middle of 1,840 to 1,920. I think one of the parts of normalization is that the market is likely to find reasons to get to a more

normal level of P/E. I don't think that is a bad thing, and I think that is part of this process. It does not necessarily mean that the underlying U.S. economy is slowing. It may turn out to mean that, but it says a lot more about the non-U.S. economy than it does about the U.S. economy, as the composition of the S&P is so dramatically different. That has been increasing during our lifetimes, and people are used to thinking about it in the old way.

The only other comment I'd make, and I have talked to Nellie about this, is on this issue of high-yield ownership in mutual fund form. I know Nellie is working on this. I think there is a natural mismatch between high-yield bonds, which by their nature trade these days very infrequently but are held in mutual fund form at a size that offer daily redemptions. Third Avenue was indicative of it. My fear would be, and we will talk about this later, that if oil did get down to \$15 per barrel—which I think is not unreasonable—and high-yield spreads widen more, some of these reforms, such as swing pricing, may not really be sufficient to deal with the run that could occur. I know this would require a change in law, but I hope we keep talking about the idea.

If mutual funds are going to hold, in size, relatively illiquid assets—that is, if these assets cannot trade in size—I would love to see us revisit whether they should go to quarterly liquidity or longer or have the ability to gate put into their provisions. And I do believe someday we're going to make these changes. I would prefer that a blowup did not cause us to make these reforms. I know we have limited, not complete power in this, but I would hope we keep raising it.

CHAIR YELLEN. President George.

MS. GEORGE. Thank you, Madam Chair. I just wanted to make a brief comment about the low-for-long paper, which I found helpful. I take the conclusions that there are no immediate

or near-term problems regarding financial stability as some comfort. But also, in connection with President Rosengren's point: When I look at things like CRE, I think that we'll have to continue to watch the implications of our policy for various asset classes for fiscal policy effects and other macroeconomic effects over the long term to see how those are being affected.

I wanted to make one specific point, as it relates to the effect of low rates on bank net interest margins. I would add to that that the flattening of the yield curve—which has come from our policies, in conjunction with forward guidance that kept expectations of policy rates low—has played a role in compressing those margins for banks. And I would point to some research by my staff that suggests that the flatter yield curve is actually more consequential than the level of short-term rates in affecting, particularly, community banks, and that, as we begin to normalize short-term rates, unless the yield curve moves, that could actually worsen their net interest margin position.

CHAIR YELLEN. Thank you very much. Governor Brainard, did you want to comment? [No comment indicated] Okay. If there are no further comments on financial stability, I think we're ready to begin our economic go-round. I hope we will be able to finish this before we break for the day, but we'll see. President Williams.

MR. WILLIAMS. Thank you, Madam Chair. In San Francisco, we are preparing to host the Super Bowl—"SB50," as all the posters say. The actual game is 45 miles away, in Santa Clara, but the big pregame party is all set for next week in the city itself.

MR. BULLARD. President Williams?

MR. WILLIAMS. Yes.

MR. BULLARD. Are your guys in that Super Bowl? [Laughter]

MR. WILLIAMS. We are hosting the Super Bowl. Revenge is a dish best served cold, President Bullard. I've got to read my jokes. [Laughter]

MR. TARULLO. President Bullard, do you have a team in your District? [Laughter]

MR. BULLARD. In the future, we won't be in any bets with San Francisco.

MR. EVANS. Well, the typical comment is that he does have a team so it's very apropos.

MR. WILLIAMS. The fenced-in party zone starts literally at the front door of the San Francisco Fed. And with all the congestion and crowds, the Bank and other local employers will likely scale back to only essential operations. So I expect a surge in spending from football fans in our District next week but also a drop in hours worked.

Now, the national economy is the opposite pattern: strong employment but weak spending. And I don't think this disconnect is all that troubling. We have seen it before. In fact, this will be the eighth time over the past five years that we will have gotten negative labor productivity growth in a quarter. In all but one of the earlier cases, productivity fell because output growth turned out to be temporarily weak. What we have seen is that relatively stronger employment data turned out to give the more accurate signal on underlying fundamentals.

The strong job gains but weak GDP growth in the fourth quarter reflect a fundamentally healthy domestic economy, but it is being buffeted by developments abroad. Sectors with direct exposure to the dollar, weak foreign demand, and falling energy and commodity prices have underperformed. But the sectors hardest hit, such as manufacturing, drilling and mining, and agriculture, account for less employment than they do output. In contrast, the large domestic services sector of the economy, including restaurants, health care, and professional and business services, is doing quite well. Notably, of the 2.6 million jobs added last year, 94 percent were in

services. Strong domestic services demand provides a fire break or a flood bank—we need both in California—against shocks from abroad. Therefore, I continue to expect above-trend growth this year and balanced risks.

Reports from my directors and other contacts confirm the view that the new hiring and low gas prices should provide ample resources to support more consumer spending. As enumerated in the Tealbook, a broad range of labor market indicators have improved significantly over the past year and are nearly unanimous in signaling that the labor market is very close to our maximum employment goal. Even labor force participation is very near its estimated trend. The one exception to the good news on labor utilization is the still-elevated level of involuntary part-time employment. However, my staff recently reaffirmed their earlier work that shows that the degree of additional slack implied by elevated involuntary part-time work is likely to be quite small. Another indicator of labor market slack is wage growth. And over the past eight years, wage behavior has been, at times, puzzling. During the recession, aggregate wage growth didn't fall as much as we might have expected, and then later, during the recovery, despite the considerable improvement in the labor market, wage growth has remained stubbornly low.

Some recent research by my staff argues that these two puzzling episodes of contradictory wage growth in part reflect changes in the composition of the labor force that are associated with movements into and out of full-time employment. Specifically, during the Great Recession and early in the recovery, aggregate wage measures were propped up because it was predominantly low-wage workers who were let go. The employees still on the payroll generally had higher-than-average skills and wages. The shift in the mix of workers—the so-called

upscaling of the labor force—boosted the average aggregate wage and had the effect of moderating the cyclical decline in nominal wage growth.

More recently, as the labor market has strengthened, this pattern has reversed. Many workers on the sidelines of the labor force who were holding part-time positions have been moving into full-time employment. The vast majority of these new workers earn less than the typical full-time employee, so their entry—or the downscaling of the labor force, if you will—pushes down the average wage. Now, superimposed on these cyclical dynamics is the “silver tsunami”—that is, the retirement of the baby-boom generation. And the exits from full-time employment of older, higher-paid retirees have put downward pressure on wage growth. Further, with so many still to retire, this more secular downscaling is a headwind to higher wage growth. It is likely to continue for some time.

All in all, my staff estimates that the changes in the composition of the labor force are pushing down the rate of growth of median weekly earnings by more than 1 percentage point. Other measures of nominal wage growth are also being held down by such compositional changes in the workforce. And, in fact, even the ECI, which holds the composition of occupations constant, is susceptible to the same problem, because the composition of workers in these very broad job categories can shift.

So what’s the implication of this research? The main result is that the sluggish wage growth may be a poor indicator of labor market slack if you don’t control for the compositional effects that I just outlined. In fact, correcting for worker composition, wages are consistent with a stronger labor market that is drawing lower-wage workers into full-time employment. And some support for this view can also be seen in the productivity data. The same compositional flows affecting wage growth also clarify why productivity growth was very strong during the

recession and early recovery and why it has been so weak recently. My staff estimates that, from 2007 to 2010, the shift from low- to higher-skilled workers almost added 1 full percentage point per year to labor productivity growth. And these are very big effects when you think about the cyclical movements. Since then, with downscaling pressures, the overall pace of shifting from low- to high-skilled workers has declined, and this contribution has been cut to only about $\frac{1}{4}$ percentage point per year.

This productivity effect leaves the effect of the shift in labor composition on price inflation unclear. To the extent that firms keep their wage bills low by hiring lower-wage workers, labor cost pressures will provide less impetus for higher price inflation. However, if these lower-wage workers are less productive, then continued increases in unit labor costs may be hiding behind the lower readings that we are seeing in nominal wage growth. And I think this is just something that we have to be aware of when watching the wage data over this year.

Thank you very much.

MR. TARULLO. Madam Chair. President Williams, is all of that research you talked about on your website?

MR. WILLIAMS. Not yet. This is a preview.

MR. TARULLO. Okay.

MR. WILLIAMS. But we're happy to share it. I think the work on productivity, though, is previous work.

CHAIR YELLEN. Thank you. President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. Since the December FOMC meeting, incoming data have significantly reduced our estimate of Q4 real GDP. Sizable declines in stock and commodity prices have also raised the possibility of slower global growth. Yet in light of

these data, we saw surprising strength in payroll employment in December. Which of these data portend the true underlying strength or weakness of the economy?

Although incoming real data have been, on balance, weaker than expected, they are not of a magnitude that one would normally expect to cause such significant asset price movements, and much of the real data reflect what are likely to be temporary phenomena: mild weather effects on service spending and a two-quarter inventory adjustment. While official data reports from China may overstate actual economic activity, other independent evidence indicates limited direct trade effects, which are hard to reconcile with the observed large declines in stock indexes around the globe. Similarly, the positive correlation between oil prices and stock indexes in countries that are large importers of oil and thus should benefit from lower oil prices is somewhat puzzling.

Furthermore, while there have been some reductions in estimates of foreign growth by many forecasters, they are relatively modest compared with asset price movements. With little fundamental economic data to explain such large asset price movements, a reasonable interpretation is to view asset price movements as a temporary exogenous net worth shock that is unlikely to have much of a permanent effect on the economy. As a result, other than weaker near-term forecasts of data that reflect wealth effects, the Boston staff forecast has not changed materially. As I do not have a good explanation for recent asset price movements, I must admit to some unease about my forecast, and, like the Tealbook, I view the downside risks to my forecast as being elevated relative to December.

One source of my anxiety is whether the consumption-led economic growth over the next year will be as strong as forecast in the Tealbook or in my own forecast. Current estimates regarding consumption in the fourth quarter were weaker than many earlier forecasts. And over

most of the recovery to date, actual consumption has tended to come in lower than expected, particularly when considering the gains that have been experienced in both disposable income and household net worth. One possible explanation for this lower-than-expected growth in consumption is that consumers are not consuming as much of the disposable income freed up by recent declines in oil prices. However, work done by the Boston staff that utilizes account-level transaction data that include every transaction from checking accounts, savings accounts, and linked credit cards for more than a half-million accounts finds that the marginal propensity to consume from the newly available real income that is generated by a gas price decline is 80 percent. Similar results were found in a recent JPMorgan Chase Institute study based on data on Chase customer debit and credit cards. Because the Boston model expects individuals to spend roughly 80 percent of savings from lower gas prices, this does not seem to account for the lower consumption.

An alternative explanation for the consumption shortfall is that the income gains in this recovery have disproportionately accrued to high-income individuals with a lower marginal propensity to consume. Work by the Boston Federal Reserve staff has found that a large fraction of households in middle- to lower-income deciles have current resources below recession levels, and that much of the income and wealth gains that we see in aggregate data have accrued to affluent households who tend to have a lower marginal propensity to consume. This would imply less pent-up demand for consumption and may suggest that misses in consumption forecasts reflect compositional shifts in income and wealth that may be more persistent. Thus, saving may remain high relative to aggregate disposable income and wealth.

A third explanation is that consumers are still scarred by the experience of the Great Recession and thus will maintain higher precautionary savings. This scarring may be

exacerbated by recent, highly publicized declines in U.S. and global stock prices. Anecdotally, I must say that the number of people commenting on their 401(k) plans, from the Federal Reserve lunchroom to audiences at my speeches around New England, has certainly gone up. This scarring might indicate a greater reluctance to spend than is reflected in my current consumption forecast. One piece of evidence that runs contrary to this, however, is that the most recent responses to the University of Michigan Surveys of Consumers suggest little, if any, response to recent financial market developments.

In summary, the downside risks to the economic outlook in my view are higher than in December. I will be highly attentive to evidence that consumption growth may be slower than forecast. In some sense, the canary in the consumer coal mine may be whether large purchases, such as car purchases, are postponed because of the recent financial turbulence. Were the economy not to grow at potential, this would have implications for my desired path of interest rates, which I will discuss tomorrow. Thank you.

CHAIR YELLEN. Thank you. President Lockhart.

MR. LOCKHART. Thank you, Madam Chair. The tone of conversations in recent weeks with directors and contacts in my District was subdued compared with the previous FOMC cycle. We detected a downshift in confidence. With only a few exceptions, business activity in the fourth quarter and the first weeks of January was characterized as disappointing. Retail contacts reported mixed sales over the holiday season, with many brick-and-mortar retailers reporting deep discounting, especially in apparel.

Notwithstanding strong sales numbers, we heard a similar report from our large auto retailer director. This is a national-scope company. Sales slowed somewhat over the fourth quarter despite being supported by heavy discounts and incentives. Our director indicated that

retail auto inventories are high, and he expects auto production to scale back in 2016. He does not anticipate a significant overall drop-off in auto sales. The exception is the luxury car segment, which he claimed is directly tied to equity market performance. Despite continuing strong sales, he offered the opinion that the domestic auto market is not likely to be a factor pushing consumer activity growth, as it has been in recent years.

We heard more upbeat reports from residential real estate contacts. They reported increased sales and construction activity, at least compared with year-ago levels. The Friday existing home sales print exceeded our expectations and raised our tracking estimate for the fourth quarter by 0.2 percent, to 0.9 percent. After a first few days of January characterized as “dead,” banker contacts noted that mortgage applications have picked up in recent days. Our commercial real estate contacts depicted the construction pipeline as steady. A few contacts noted a slowdown in multifamily development and some weakness in retail, but overall, we heard little concern about a change in momentum in commercial real estate.

From our energy-sector contacts, mostly in Louisiana, we heard concerns that firms in this sector are still adjusting to lower oil prices and expect further cuts in investment and employment. Although localized, we heard reports that the direct economic effects of oil prices are spawning more indirect effects. Spillover is accelerating. Likewise, we heard pessimistic sentiment about the outlook for manufacturing. Sluggish growth abroad and an appreciating dollar continue to weigh on companies with a significant export component of sales.

In this round of director summaries, we picked up strong opinions that, on the basis of their experience in the fourth quarter and January to date, firms are beginning to temper their 2016 economic growth expectations. We heard reports of heightened caution as regards capital expenditure plans for expansion. Projects are being shelved or their timelines extended.

Anecdotal feedback on labor market conditions portrayed a reasonably strong situation somewhat at odds with signals on economic activity. Business contacts continue to experience areas of labor market tightness, and tightness is spreading. Firms reported increased wage pressures in an effort to attract or keep workers. I consider it noteworthy that the Atlanta Fed's Wage Growth Tracker shows the growth rate of low-skill wages to have caught up with middle- and high-skill wage growth after having lagged for most of the recovery.

With regard to the national economy, at this point, I'm pretty certain the GDP growth number for the fourth quarter of 2015 will show a meaningful slowdown. As mentioned, the Atlanta Fed's GDP tracker for Q4 is just under 1 percent. Like our business contacts, I'm unsure whether the fourth quarter will turn out to be just a temporary dip or the onset of a more persistent period of weakness. I have not adjusted my 2016 outlook from what I submitted in December. My full-year 2016 forecast regarding economic growth is just a little higher than what's in this meeting's Tealbook, but at this juncture, I find it hard to reconcile broad-based indications of slowing activity with the continuing strength in jobs growth, and I have to question whether the divergent signals on growth momentum and the labor market can persist.

As regards the inflation outlook, we will likely see a short period of firming as last year's drop in energy prices roll out of the 12-month numbers. But due to the recent drop in energy and earlier declines in commodity prices, I anticipate a 12-month headline inflation trend near zero by midyear, and I would not be surprised if core measures also reflect some of this softness. So I'm expecting inflation readings in the near term to be pretty messy—a technical term.

Regarding inflation expectations, I'm sticking with the view that longer-term expectations remain well anchored. I'm influenced in this view by my Bank's business inflation survey and my staff's work that argues that inflation compensation can be explained by market

adjustments of risk and liquidity premiums. If the first quarter produces a bounceback from the fourth and moderate economic growth continues through the year, which is my forecast, I expect to see a firming of the underlying inflation trend later in the year. But clarity could be elusive well into the year, and policy calls in March, April, and June may have to rely on forecast assumptions as opposed to outlook-confirming evidence.

All things considered, my read on the balance of risks has moved a little to the downside. Were it not for the solid labor market reports, I would have shifted my balance of risks for economic growth lower. A lot of negative factors are ganging up on my risk assessment at the moment. On my list are fourth-quarter economic growth estimates, global financial market volatility, and the effects of falling oil prices. We will take up the matter of how to deal with all this in our statement in tomorrow's policy round. Thank you, Madam Chair.

CHAIR YELLEN. Thank you very much. President Harker.

MR. HARKER. Thank you, Madam Chair. Economic activity in the Third District has continued to improve since December, but growth may have slowed a bit. Manufacturing activity worsened slightly, while nonmanufacturing firms continued to see modest sales growth. Bank lending continues to improve, with loan growth exceeding 10 percent, according to some of our contacts. And commercial building has continued at a relatively high level of activity.

The January Manufacturing Business Outlook Survey responses were generally weak and remained well below trend. The general activity diffusion index for January came in at minus 3.5, but this was an improvement from minus 10.2 in December. The indexes for new orders and unfilled orders were also negative in January, but, again, improved compared with December. Shipments for January rebounded into positive territory, and inventories were being drawn down more rapidly than in December. Taken together, these data suggest that

manufacturing output is declining slightly in the region and at a less rapid pace than in December.

Weakness is not uniform, however. Some manufacturers are doing quite well. Driven by strength in aerospace, one metal stress-testing firm has seen sales rise by 20 percent, and area manufacturers remain upbeat. The diffusion index for future general activity remains comfortably in positive territory. However, it has been trending down since last summer. The survey's labor market indicators suggest slightly weaker employment in January, and most firms reported no change in product prices in January. In special questions regarding the effect of lower energy prices, over half of the firms reported this is a positive for their business, while 30 percent reported it as a negative. Firms mentioned lower costs of production as the main reason for a positive effect, while firms reporting a negative effect tied it to a decline in demand from energy production-related customers.

Regarding the effect of lower energy prices on future demand, firms are evenly divided, with roughly one-third being unaffected, one-third experiencing a negative effect, and the remaining one-third being affected positively. Though the index remained positive, nonmanufacturing activity in the District appears to have slowed. Our Nonmanufacturing Business Outlook Survey headline activity index fell from 26.7 in December to 2.9 in January. The index of expected future activity weakened, as firms saw both their prospects and the prospects for the region as worsening over the next six months. At the same time, though, the nonmanufacturing respondents saw only a modest change in the general business activity at their own firms over the last month. So there is a bit divergence between what firms are seeing in their own business activity and what they perceive is happening around them. The survey suggests that firms are more uncertain, obviously, about the economy.

Employment in the region continues to improve, on balance, but the growth was mixed. New Jersey and Delaware saw employment growth in November at a much faster pace than the nation as a whole. But employment growth in Pennsylvania was flat and has been weak for the last three months. The three-state unemployment rate edged down to 5.1 percent in November from 5.2 percent in October, and so remained in line with the nation. We are continuing to hear reports, as others are, of the difficulty of hiring skilled labor. Skilled engineers are in short supply, and one light truck service station reported having difficulty in finding skilled technicians despite offering very high yearly salaries.

Keeping with Madam Chair's request for brevity, I will skip the normal Beige Book report for the Third District and turn to my views on the national economy. The economy appears to have less momentum entering 2016 than I thought in December. Nevertheless, my near-term forecast continues to be that of economic activity rebounding to a pace above 2 percent this quarter and then growing at near trend in 2016. The continued fall in oil prices and appreciating dollar will lead to further downward pressure on headline and core inflation, but survey measures of inflation expectations have remained fairly well anchored. As oil prices and the dollar stabilize, I remain optimistic that inflation will rebound toward our 2 percent target over the medium term.

The recent downturn in worldwide equity prices obviously is a cause for concern, but I find it difficult to extract much signal about the domestic economy from these movements, especially in light of the ongoing strength in the labor market and the generally high levels of consumer confidence. Rather than sharply deteriorating fundamentals, stock prices may be reacting to domestic, political, geopolitical, and policy uncertainty. I do see somewhat higher downside risk to my forecast, especially if asset prices continue to fall or remain depressed for a

long period. For now, though, I see these developments as likely to be transitory and the economy as strong enough to absorb them without a worrisome adverse effect. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Madam Chair. As we know, since the December FOMC meeting most of the news about energy has been negative. Let me just go through the data that we accumulate at the Dallas Federal Reserve and what we hear from our contacts. We now believe the excess of supply over demand today is approximately 1.5 million barrels a day. This is higher than we had estimated in December. Why did this happen? It turns out that the DEA and other sources probably overestimated the amount of U.S. production cuts. And it has turned out that U.S. production declines have been stubborn. There is also clearly a time lag between cap-ex cuts and actual production declines. In addition, there have actually been production increases in places like the Gulf of Mexico and where there are long-lived projects. In addition, the shale industry is much more productive than it was a few years ago. This is creating a greater supply–demand imbalance. Also, we now believe that by the end of 2016, we will still have an oversupply of approximately 300,000 barrels per day. The average oversupply per day during 2016 we now believe will be approximately 750,000 barrels a day. This won't be linear. We continue to expect that by 2017, supply and demand will get into daily balance, but you still will have the excess inventory to work off. We have now revised upward our excess inventory estimate, and we now believe that global excess inventory is approximately 400 million barrels. We talked previously about the prospect of Iran coming online. That production is now factored now into these numbers because it appears that, by February, Iran's production will in fact get into the market. Some of that, as I mentioned last time, already has. We believe their daily

production is somewhere between 2.8 and 3.3 million barrels. Plus they have, in our view, 30 to 40 million barrels of inventory.

One of the new issues that has now gotten into the thinking of this industry and people who trade oil is whether some lack of capacity will constrain the ability to store the commodity. People still believe we will have enough storage capacity, but they're starting to be concerned about it. And this is particularly the case, in view of the behavior of the forward curve. If the forward curve is not more upwardly sloping, there's not much incentive for people to store oil. The prospect of production not going into storage, but going into the market, is further, in our view, depressing prices.

We still believe that, in 2016, daily demand will increase by, on average, 1.4 million barrels a day. In addition, when we talk about Saudi Arabia, our contacts have said to us, "Saudi Arabia wanted lower prices. They wanted to hurt the shale industry in the United States. They wanted to hurt Russia. They wanted to be maybe a thorn in the side of Iran. They did not, though, want this level of prices or this level of instability." We were talking about the sovereign wealth funds earlier. There is increasing fear in Saudi Arabia, we are hearing from our contacts, about the domestic unrest that could come from this situation.

At the Dallas Fed, we've talked about three basic potential scenarios for this year. One, we could plod along, plus or minus \$30 per barrel. Another scenario, which we think is distinctly possible, is, we will get down to \$15. This will happen if storage becomes an issue, if the forward curve stays flat. But I think people in the industry who have the ability to do so are preparing themselves for the possibility that it could get down to \$15. Keep in mind that we think incremental cash costs in this industry are probably somewhere between \$25 and \$30 per barrel in the Permian. And in some other places like the Bakkan and Eagle Ford, cash costs, we

believe, are in fact higher. So we've gone from worrying about capital structure in this industry to now worrying about the ability of these companies just simply to generate cash flow and viability.

The other potential development—it would not surprise us, although you can't predict this—is that we will wake up one day and see that Saudi Arabia has made an agreement with other OPEC countries to modestly cut their supply and do it proportionately. In our view, that alone could actually kick up oil prices to between \$40 and \$60 a barrel. It could make a dramatic difference. We would not rule that possibility out at this point, in view of the potential instability that Saudi Arabia may be fearing. So that is oil.

Obviously, none of this is having a very positive effect on the 11th District. Manufacturing is shrinking. The service sector has been growing, but at slower rates. We now expect job growth in Texas to be approximately 1.1 percent in 2016, assuming \$30 per barrel oil. This is versus 3.6 percent job growth in 2014. The unemployment rate in the state is now 4.7 percent. We think risks are that unemployment rate will increase from here. And, interestingly, Austin and Dallas seem to be particularly resilient in this period. Houston is suffering the brunt of this weakness, as well as along the border, because of the strength of the dollar.

I have one last comment on the national economy. Understanding, as everyone else here does, that we have much weaker data for the fourth quarter, we are basically taking for the moment a wait-and-see attitude about our GDP forecast. We still believe, for now, that it could be 2 to 2½ percent. You could still have sufficient job growth to drive down the rate of unemployment. And in terms of inflation, we will be very interested in watching the trimmed mean data, which continues to run between 1.6 and 1.7 percent. But, in particular, we will be

watching the effect of China's devaluation; the stronger dollar; and tighter economic conditions, both in terms of the wealth effects and tighter financial conditions. And I would have to say that our forecasts for the national economy are such that the risks are to the downside. But I think the main thing we have been talking about in Dallas is that only time will tell, and we're just going to have to wait and see. It's too soon to judge. It's too soon to revise our forecasts. We may change our mind here in the next four to eight weeks. Thank you.

CHAIR YELLEN. Thank you. Governor Fischer.

MR. FISCHER. Thank you, Madam Chair. Since our decision to begin normalizing interest rates in December, the news from the labor and output markets has continued to arrive in a familiar pattern: a very strong labor market with disappointing real spending. That pattern, which remains difficult to explain, has been complicated by the volatility in financial markets and by the continuing decline in the price of oil. Thus, I am somewhat more uncertain about the trajectory of real economic activity and the inflation rate than I would be if all of the data were aligned. This meeting is a time for watchful waiting to see how the uncertainties of the current situation resolve themselves over the coming months. Although we should recognize that they may neither resolve themselves nor resolve themselves in a manner that reduces uncertainty about future inflation and growth.

The news from the financial markets, both domestic and international, has been unsettling. My sense is that this bout of volatility will subside as the volatility in August did and allow us to proceed more or less—probably a bit less—on the path I had predicted when filling in the December SEP, which was three increases in the federal funds rate in 2016. However, there is more uncertainty and downside risk associated with that prediction than there was only six weeks ago. That uncertainty arises from the possibility that the current asset market

instability presages deeper weakness to come. The inability so far of the Chinese authorities to clarify and communicate their exchange rate policies is one source of uncertainty—uncertainty that, in the case of China, is strengthened by concerns that economic growth may slow more sharply than the anticipated gradual decline from the vicinity of 7 percent to a somewhat lower rate over the next five years or so. And there are some foreign economies whose growth performance has been better than expected. That includes India and, to a lesser extent, some countries in the euro zone.

There is another factor that has begun to receive attention, and we started talking about it in connection with the work on financial stability an hour or so ago: the expected effect on asset prices of the beginning of the unwinding of the extremely accommodative monetary policies that central banks have put in place during the last seven to eight years. Those policies were put in place in the expectation that doing so would lower interest rates and increase asset values, Tobin's q in particular. The lower interest rates and the increase in wealth would increase both investment and consumption through intertemporal substitution and wealth effects, and thereby increase aggregate demand.

Well, the effect of the low interest rates on asset prices, especially equity prices, happened, but there was less effect on investment, in part because the housing market did not recover as rapidly as expected. Markets have reason to believe that the period of extraordinary accommodation is now beginning to end, even though we have indicated that we will raise rates at a pace that is likely to be gradual. The beginning of the slow process of normalization has increased the probability that equity prices, too, will begin to normalize, which means that the very high q will likely decline. That is a reasonable expectation, especially because the economy has not grown as fast as markets must have expected when the Great Recession began.

The outlook for inflation remains a concern. I retain my belief that the basic logic of the Phillips curve will, in the medium term, assert itself. And, indeed, the rate of compensation increase has moved up somewhat. But we have continued to see further decreases in inflation, resulting from the continuing fall in oil prices and the ongoing effects of the appreciation of the dollar. I continue to believe that the ongoing declines in oil prices and in the appreciation of the dollar are temporary, and that when they stop, we will, after a while, see actual inflation rising to our target rate of 2 percent. But the recent behavior of the price of oil and the weaknesses in many foreign economies have further delayed the beginnings of that return. This further delay in the increase in inflation, in conjunction with the increase in downside risks to both output and inflation, have increased my uncertainty about the outlook and led me to the view that the trajectory of rate increases may be flatter than I had expected in December.

But there appear to be elements of herd behavior in the financial markets. Steve Kamin referred to that in his presentation. And we could see a stabilization or change in direction of those markets before the March meeting. Of course, our views will also be informed by the rate at which employment increases. Thus, the signal we will send by and following our decision tomorrow will be extremely important. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Tarullo.

MR. TARULLO. Thank you, Madam Chair. My only two points on the economy are, I think, in agreement with what many of you have already said. First, I agree that the baseline economic outlook hasn't really changed much since December, though I was and remain somewhat less optimistic than the median participant on GDP growth and the degree to which inflation will turn toward the 2 percent target. Second—and here I thought I was not going to be as much in agreement, but I think the first half-dozen of you roughly agree with what I am about

to say—I think that the risks are now weighted to the downside, as compared with December. At that time, I thought they were only modestly so, but I find them now decidedly weighted to the downside. David, Dennis, Eric, Stan, and probably a few others of you have already mentioned some of them, so I won't rehearse them in turn. I did, though, want to emphasize one in particular. I think the upside risks for the dollar and the associated downside risks facing the economy are rather greater than the Tealbook suggested and than I have heard to this point. Some of that is because of my view on developments in China, and some of it is because of where I think the Bank of Japan and the European Central Bank may go and the Bank of England may not go over the course of the next several meetings.

On China, I think anybody who thinks they know what is going on there is fooling themselves right now. I was struck, when Governor Fischer and I were in Basel two weeks ago, by the divergence between those who are mostly talking to the professionals and those who would actually talk to senior political leadership, obviously not in Basel but elsewhere. There was a pretty big divergence in the perceptions that those two groups had, which suggested that there is still an effort within China to figure out where they want to go, and that there are political impetuses or constraints overlaid on the judgments that the professionals in the People's Bank are making on a regular basis.

I want to turn away from the economy as such for a second, to talk a bit about the monitoring mechanism for the components of inflation that David Wilcox introduced. And I first want to thank the staff for taking the time and effort to try to develop such a mechanism. In December, when the Committee concluded that it had reasonable confidence that inflation would return to the 2 percent target, the SEP medians for both core and headline inflation for 2016 were 1.6 percent. Behind those projections was a narrative—to some degree explicit, to some degree

implicit—about how those outcomes would be realized, such as through fading effects from energy prices, increasing effects from further reductions in the output gap, and—for some, perhaps—other factors such as the reemergence of significant increases in health-care costs.

Some of us who have rather more hope than confidence that this is the path inflation will follow were particularly focused on the inclusion of language in the December statement indicating that “in light of the current shortfall of inflation from 2 percent, the Committee will carefully monitor actual and expected progress toward its inflation goal.” And I think that this is obviously what the staff is trying to help us do. I would welcome efforts by Reserve Bank staff or others to create complementary mechanisms that will, in effect, impose some discipline on the statement of reasonable confidence that was made in December—reasonable confidence, with a trajectory and a narrative behind it. And I think it’s important that we be testing that in real time, not necessarily because actual inflation may go up during that period. I think there is every reason to believe that with the change in energy prices, even since December, that won’t happen. But as the decomposition of the core inflation rate in David’s exhibit 9 shows, there is a way in which we can question ourselves on an ongoing basis as to whether what was expected to happen is in fact in the process of happening, or whether it isn’t happening, or something else has intervened in the interim. And I think by doing that, some, like me, who were a little bit less than reasonably confident, might be made more so. Or, contrariwise, those who were reasonably confident might have some grounds for questioning those assumptions. I think it is important to have this discipline. And, actually, Jim, it’s one of the reasons why I do think it’s important to look at the actual inflation numbers as well as expectations. It’s in order to discipline the expectations, because the actuals help us test the basis on which prior expectations were formed to see if those have to be modified in the future. The staff, too, I think, can help us isolate what’s

going on underneath, particularly, the core numbers, and if not provide definitive answers, at least provoke a discussion among us that will enhance that self-discipline as we try to see whether the expected path of inflation will in fact track, fall short of, or even exceed what we put forth in the December SEP. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Powell.

MR. POWELL. Thank you, Madam Chair. Since the December meeting, incoming spending and production data have been weaker than expected. The weakness was partly due to lower consumption of energy services thanks to unusually warm weather late in the year and to a negative surprise in inventory investment, both of which should prove to be transitory factors. Labor market data, on the other hand, were strong right through December, with monthly increases in payroll jobs averaging 284,000 for the fourth quarter and 220,000 for all of 2015. Wages seem to be on a path of moderate increases, with signs of gradual acceleration. In addition, the Michigan survey shows ongoing strength in consumer confidence, as do the latest Conference Board and Bloomberg surveys, suggesting that, for now, consumers view the world as more like that indicated by the labor data. Putting all of that together, the nonfinancial data suggest that one might reasonably expect the economy to continue to expand at a moderate rate, although probably lower than what was expected in December.

The financial markets appear to be expressing a different view. With the big selloff in risky assets since the December meeting, the S&P 500 is down 7 percent. Credit spreads have increased further, especially for lower-quality issuers. Volatility has spiked, and oil prices are down another 20 percent. The broad trade-weighted dollar is up 2½ percent. Overall, there has been a significant tightening in financial conditions estimated by credible external economists as the equivalent of three or four tightenings. On the basis of my reading of the vast flow of

commentary out there, it seems that macroeconomists generally take only modest signal from the financial market selloff so far and see increased but still relatively low chances of a significant reduction in economic growth or a recession.

The Tealbook view—and I think the Tealbook does a great job, by the way, of assessing the downside risks to the modal view—is essentially also in that vein. It is also my view, although I hold it with fingers crossed for hope. Nonetheless, the financial markets are signaling elevated risk, and some financial economists point, in particular, to the big increases in credit spreads as a sign of trouble. And I understand that Thomas is going to be discussing some of that work in his presentation, I take it, tomorrow morning. The intense risk focus is clearly evident in conversations with investors and in the rash of pieces by Wall Street economists asking whether a recession is coming. That fear may or may not be justified. And even if it is not justified, the deterioration in financial conditions may itself contaminate real activity by holding back household consumption or business hiring and investment.

And as I'm sure many have around the table, I've been trying to unpack what is really driving the financial market, because it's not the real data. And I can come up quickly with four related stories, probably all four of which are playing some kind of a role. And all of them strike me as having some basis, but, frankly, as either overdone or premature. Of course, there's no way to know. We're not good at predicting these downturns, and we'll have to simply wait and see.

The first narrative, though, is really grounded in U.S. cyclical considerations. And I think that this is the one probably gets less play than China and oil and the fourth one I'll talk about. And it goes along the following lines. It's pretty downbeat. I don't vouch for all of this, I'm just reporting it. The manufacturing sector is barely growing, thanks to the strong dollar and

lower oil prices. The service sector is growing but has to carry an awful lot of weight with little help. The corporate profits cycle has turned, and they have begun to decline from their peak. After years of cost-cutting and meager investment, U.S. businesses have squeezed their income statements to the limit, and to continue to drive earnings, they will have to start doing more with their balance sheets. The credit cycle has also turned, for now. Spreads have blown out, and banks are tightening credit standards for C&I and CRE loans. The flow of newly issued leverage loans has dried up. And against that background, asset prices have had support from years of accommodative monetary policy and have been ripe for a correction. Meanwhile, global economic growth is even weaker than our own, which will hurt us through our stronger dollar.

I said it was downbeat—very downbeat. And if you take all of that together, that does amount to a credible set of factors that could weigh on economic growth through credit availability, wealth reduction, and a stronger dollar, not to mention general risk aversion. It's a plausible, if premature, story for a weakening economy. We don't yet see it in the labor market data or the real data. And I also know that if you look at the factor models or the leading indicator models, they don't actually prove this up. But the persistence of these factors means that, over time, they could well prove it up.

We've talked about the second and third narratives, China and oil, a lot already. The China story concerns the risk of a hard landing, a substantial devaluation of the renminbi, or both. Markets are also unnerved by the apparent clumsiness since last summer on the part of typically sure-handed Chinese economic officials. And overall leverage in the Chinese economy increased very rapidly after the crisis to quite high levels, which is a story that doesn't tend to end well. Yet, as Steve pointed out, incoming economic data from China show no sign of

unexpected weakness. There is no doubt that China faces a difficult transition, but it may be that China can manage through this.

The oil story is that low oil prices, driven by weak demand and a supply glut, will undermine U.S. activity either through financial contagion or by reducing activity in the oil patch. The domestic financial contagion story is real, but I am not sure how substantial it is. The debt issued by energy firms is not now held principally by large, systemically important financial institutions, but rather by mutual funds and other asset managers. And we haven't seen difficulties there. I do take President Kaplan's point that we haven't run the test with \$15 oil. And it may be that credit spreads on high-yield bonds for oil and \$15 per barrel oil could produce run characteristics and damage the economy. We haven't seen that yet.

There's also the possibility, as outlined in the "China-Driven Crisis in the Emerging Market Economies" alternative scenario, that lower oil prices could really put commodity-exporting emerging market countries in serious trouble. And we would certainly feel that kind of a crisis. But without such an event, it's worth remembering, I think, that low oil prices should be a net benefit for our economy. We are a very large oil importer. The pain may be front-end-loaded through declining drilling investment and weaker oil patch employment, but the overall proposition that oil prices benefit the U.S. economy still seems to be right to me.

A fourth and final factor may also be playing a role, and that is that—someone referred to it over here earlier—central banks have changed their posture and may no longer be standing in such a supportive way, relative to asset markets. So there's a reasonable possibility that all of these bad narratives may linger in the financial markets and weigh on economic activity. We'll just have to wait and see.

Two final comments, Madam Chair. First, on inflation, the stronger dollar and lower oil prices will mean that these negative effects will linger even longer, which will allow further patience on the Committee's part. The underlying story of inflation returning to 2 percent in the medium term is still credible to me, assuming that economic growth continues above trend and the labor market continues to tighten. Second, and finally, it does seem to me that the balance of risks has probably shifted to the downside; at the same time, it also seems to me premature to embrace that conclusion fully in our statement. More on that tomorrow. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Brainard.

MS. BRAINARD. Thank you, Madam Chair. The intermeeting period has seen an intensification of global crosscurrents, with volatility spilling over into our financial markets. The associated financial tightening poses downside risks to domestic activity, which so far has remained resilient, and to inflation, which was already soft and coming in persistently under target. I believe the underlying drivers of these crosscurrents are likely to be with us for some time.

The recent data on our labor market and aggregate spending have been mixed, with the employment data suggesting a pickup in momentum, while the spending data point to a softening. The underlying trajectory of activity likely lies somewhere between these two signals. However, looking beyond the near term, the global environment is likely to continue weighing on activity and inflation and presents an important downside risk. Global growth remains subdued, with many advanced economies facing strong disinflationary forces, and many emerging economies suffering from the combined effects of the drop in commodity prices

together with weaker demand from China. This implies downward pressure on U.S. inflation throughout the year, threatening progress on our inflation target.

Let me take each facet in turn. The December labor market report showed strong job gains at the end of last year and a continued take-up in labor market slack. Although the unemployment rate was flat, labor force participation moved up. In addition, despite changing little in December, average hourly earnings rose 2½ percent over the year, somewhat faster than the average pace thus far over the recovery. While fourth-quarter job growth seems somewhat outsized when judged against the underlying trend, the opposite could be said of aggregate spending, with indicators currently suggesting a fourth-quarter annualized increase in GDP of only ½ percentage point. Some of this weakness, such as further moderation in the pace of inventory accumulation, seems unlikely to persist. In addition, the recent weakening in some of the indicators of consumer spending, such as retail sales, seem out of sync with the support to consumer spending from job gains, real income growth, and elevated sentiment, although this might be slightly damped by the nearly 10 percent fall in equity prices since our last meeting.

Overall, I wouldn't expect spending growth to rebound to more than a moderate pace. While the housing sector looks likely to continue its gradual recovery and government purchases will offer a small additional boost, the global environment continues to weigh on aggregate activity. From the summer of 2014 to December, the real dollar increased 17 percent, and nominal changes in the dollar since then suggest another 3 percent real appreciation on top of that. As a result, net exports likely subtracted a little over ½ percentage point from GDP growth last year, and econometric models, such as the one used by the staff, suggest net exports will subtract a further 1 percentage point this year. A higher dollar, along with lower energy prices,

have also restrained manufacturing output, which looks to be close to flat in the fourth quarter, and business investment, for which indicators suggest only tepid gains heading into this year.

It has been assumed that falling oil prices would contribute on net to aggregate demand, offsetting the drag arising from the behavior of the dollar. But thus far, the offsetting contribution is hard to discern. Declines in drilling and mining investment have been sizable, while the consumption response, as others have noted, has been somewhat smaller than it has historically been. Indeed, although real income looks to have increased nearly 4 percent last year, the gain in consumption appears to have been considerably smaller and the saving rate appears to have increased by close to 1 percentage point. Also notable has been the accompanying tightening in financial conditions.

The size of the decline in oil prices, together with the large footprint of the domestic oil industry since the shale oil boom, may be leading to greater strains in corporate bond markets than historical data would have suggested. Many energy companies have experienced significant financial distress, and the associated pullback from risk appears to be spilling over more broadly. It is also noteworthy that the recent oil price decline has negatively affected important commodity-producing countries, including our two largest trading partners, Canada and Mexico, who account for nearly 40 percent of our exports. Anemic foreign demand is an important underlying driver of both the succession of downward movements in oil prices and upward movements in the exchange rate. This weakness has been widespread, affecting important advanced foreign economies and emerging economies.

In assessing the risks associated with this weakness, it's important to note that the weakening in foreign growth, the decline in commodity prices, and the strengthening of the dollar have been considerably greater and more persistent than most observers expected. While

there is good reason to look through truly transitory moves in oil prices and the dollar, the exchange rate in fact has strengthened in each of the six quarters since mid-2014, for a cumulative increase of nearly 20 percent in real effective terms. And oil prices have dropped in five of those six quarters for a greater cumulative decline. Just as the futures price of crude oil two to three years out has been subject to persistent, repeated markdowns over the past year and a half, so too the projected peak in the dollar has been repeatedly marked up. The IMF's most recent downgrade of the outlook for global growth is only the latest in a string of downgrades going back to early 2014.

In particular, the global adjustment to the economic transition in China is likely to be with us for some time. I think many people are struggling with how it is possible for China to both be hitting its domestic growth and employment targets and still see such large negative spillovers into the rest of the world economy. Structural transformation indeed appears to be under way in China, with indicators suggesting that consumption and services are indeed accounting for increasing shares of economic growth. But even if China successfully rebalances, without a sharp slowing in its domestic employment and growth, the implications of this transition away from trade- and investment-intensive activities could be quite sobering for many of its trade partners. China's massive investment has accounted for nearly one-third of global investment over the past three years, which in turn has absorbed about one-half of global consumption in metals, from iron ore to aluminum to copper to nickel.

Even with its recent slowing, China still accounts for nearly 40 percent of global growth. With imports down 14 percent last year and investment needing to contract significantly further as a share of GDP, the change in the pattern of China's growth is being painfully felt in countries from Australia to Brazil. Moreover, the accumulated financial-sector imbalances pose downside

risks, as we have seen with the sharp movements in China's equity markets. Little clarity remains about China's intentions with regard to its exchange rate mechanism. If anything, recent policy moves have added to confusion and volatility.

Since China's senior leadership affirmed their commitment to the basic stability of the RMB in the fall, the currency has depreciated materially further both against the dollar and against their preferred basket. China's exchange rate regime shift is a marked contrast to China's strategy in previous episodes of financial crisis in which China strengthened its commitment to a peg in order to foster stability. So it should be no surprise that market participants are on high alert. While there are good reasons to expect China's policymakers have the will and the capacity to avoid adverse tail scenarios to their domestic activity, nonetheless, the complexity of the challenges they face, together with their relative inexperience in managing financial market volatility that has global repercussions, should lead us to put some weight on recurring bouts of volatility rather than viewing the two episodes we have seen as one-offs.

More broadly, I think it is appropriate to recognize global challenges as a prominent downside risk to both our inflation and employment goals. At the current juncture, the threat to our inflation goal seems particularly prominent, as the most recent data suggest inflation will continue to be well short of our 2 percent target through the near term; that we have continually revised down our projections for core inflation; and that, although the staff and Committee members continue to have inflation eventually moving back to 2 percent, the timing regarding when we get there keeps being delayed.

Persistently low inflation, of course, is a concern not only here but also in many other advanced economies. Moreover, market-based measures of inflation expectations, both here and abroad, have slipped further, recently touching historic lows. The persistence and global nature

of the forces holding down inflation have important implications for the risks surrounding our inflation forecasts and for monetary policy, a subject to which we turn tomorrow. Thank you.

CHAIR YELLEN. Thank you. President Evans.

MR. EVANS. Thank you, Madam Chair. I think I'm number 10, and I'm beginning to feel the pain that some of the Governors have talked about before, listening to so many people. [Laughter] Much has been said already, but still, I'll try to spice it up and be nimble.

In spite of the strong labor market data that we received, I continued to hear mostly downbeat assessments from my business contacts. Also, the incoming data on spending have been disappointing. My view is that GDP growth for the fourth quarter will come in close to the Tealbook's meager projection of $\frac{1}{2}$ percent, and financial market developments will add some further restraint to the economy. These crosscurrents increase uncertainty over the outlooks for economic growth and inflation, and they make me nervous. Nevertheless, I think it would be a mistake to overreact today to the softer spending data and financial volatility. After all, last August and September, we found ourselves facing volatile financial markets and a disappointing slowing in job growth. We responded with a well-timed pause in our policy plans and monitored how the uncertainty would play out. Financial markets soon settled down, and the labor market improved markedly, giving the Committee the confidence necessary to take our first move toward normalization. I see us in a similar situation today. While uncertainty and the downside risks have risen in recent weeks, in my opinion, there's not enough evidence yet to adjust the basic contours of the outlook, although I admit that December's forecast does now seem a bit optimistic in light of intermeeting developments.

With this as background, it's not surprising that I heard a mixture of views from my business contacts and directors. Along the same lines as President Lockhart's comments,

manufacturers with significant international exposures continue to face a very tough business environment. Some are talking about a recession in manufacturing, notably those in steel and heavy machinery, and they see little relief in sight. In contrast, the attendees at our December 30 manufacturing roundtable were somewhat more optimistic. While they acknowledged that late 2015 was dismal, most were hopeful and expecting growth to pick up over the next 6 to 12 months. They and other contacts pointed to domestic strength in autos, aerospace, consumer-facing product markets, and labor markets in general. In light of these mixed views, I think we will just have to wait and see how it all plays out. But the international headwinds are strong. Even if the dollar stabilizes, as Governor Brainard was touching on, the trade-weighted dollar has risen 25 percent since the summer of 2014, and that's a heavy lift for tradable goods sectors.

One thing that seems clear is that financial conditions have tightened. Both Discover Financial and Ford said it has become more difficult to sell asset-backed securities. Financing is still available, but spreads are higher and market volatility makes the timing of deals problematic. Other contacts noted that new issuance of high-yield debt has essentially shut down. They report a similar contraction in the supply of leveraged loans. Our contact at PayNet, a small business credit bureau, also noted that there was an abrupt pullback in small business lending in October and November. He attributed this mostly to increased caution on the part of borrowers as opposed to supply-side developments. The bottom line is that the credit environment has tightened by more than simply our 25 basis point move. It is unclear how these conditions will weigh on cap-ex and other spending, but it seems difficult to imagine that business confidence has been unaffected. These developments bear watching, but if the essential intent of our renormalization is to tighten financial conditions, then I think we're ahead of

schedule—and Governor Powell’s comments regarding federal funds equivalent increases seem relevant on this point.

The news on inflation also suggests caution. Our December statement indicated confidence that inflation would rise to target over the medium term. Our communications have also pointed to developments that we are looking for to support that confidence, and I think the staff’s inflation dashboard ought to help us get at assessing those developments, too. And I agree with Governor Tarullo’s comments there. Stabilization in energy and import prices are prominent on the list, but both oil prices and the dollar have again moved in the wrong direction.

We’ve also cited anchored expectations as a key inflation support. I’ve been uncomfortable for a while with the continued low levels of inflation breakevens, and their recent further deterioration has only made matters worse. The most benign interpretation is that these unusually low readings can be ignored as statistical noise or market anomalies. Maybe this is right, but other measures, such as the Michigan survey’s longer-term inflation expectations, also are near 25-year lows. To remain confident about inflation pressures being right around the corner, the Committee will have to continue to look through a lot of uncomfortable data developments.

To sum up, my baseline forecast has not changed much since December, but the recent news beyond labor markets has been a sharp reminder that there continue to be large downside risks. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Bullard.

MR. BULLARD. Thank you, Madam Chair. I have been surprised during the intermeeting period by the relative weakness in U.S. economic data other than those for labor markets, the selloff in global equity markets, and renewed declines in crude oil prices. I took

some comfort that the staff forecast has not been changed substantially in response to these developments, at least as measured by Q1 real GDP growth. I thought that the staff's explanations and expectations were reasonable, at least at this juncture. Nevertheless, I think it's appropriate to watch and wait at this time to see if the seeming weakness in economic growth in the second half of 2015 persists into the first half of 2016. I'm also mindful of a topic that we've not mentioned today: Q1 residual seasonality, which has plagued us in the last couple of years. It's possible you get another weaker-looking quarter now on that basis.

Although the Eighth District continues to grow at a moderate pace, I've been concerned during the intermeeting period with anecdotes from District contacts. Some companies reported substantial drop-offs in activity in December and into January. I will be very interested to see whether the activity levels for these firms recover in the weeks ahead.

I've heard a lot about the state of U.S. agriculture since the first of the year. The U.S. agricultural sector is large. It has been doing relatively well since the recession ended, a relative strong point in the economy, but many components of this sector were weaker in 2015 because of declines in many key commodity prices since the summer of 2014. In the Eighth District, the outlook for the ag sector was considered weak during the October–November 2015 timeframe. Since then, crude oil prices have renewed their decline, and many other commodity prices fell in sympathy. Since the first of the year, many Eighth District farmers and bankers are looking at the likely 2016 prices with considerable trepidation. On the basis of the discussions I have had, I expect a particularly weak year for agribusiness income. I take this as an example of the effects of commodity price declines, which could be substantial beyond those coming directly from the renewed fall in crude oil prices.

The renewed decline in crude oil prices since early November has also caused me to revisit my ideas about the state of U.S. medium- and longer-term inflation expectations. As has been discussed here extensively, TIPS-based measures of inflation expectations over the medium term have fallen around 75 basis points since the summer of 2014, when crude oil began its recent fall. I have argued that TIPS-based measures of inflation expectations are useful indicators of the state of markets on this dimension. However, the high correlation between crude oil prices and market-based inflation expectations has been a puzzle. As President Evans was just referring to, I have argued for a wait-and-see policy on this aspect of monetary policy over the past 18 months. I thought that crude oil prices would likely stabilize and that, post-stabilization, market-based inflation expectations would return to more normal levels. But the renewed decline in crude oil prices since November 2015, which again has pulled down inflation expectations, has led me to review this assumption. I am now concerned that inflation expectations may be falling in the United States regardless of crude oil price developments, and that the Committee may have to place more emphasis on this factor than we have in the past 18 months. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Lacker.

MR. LACKER. Thank you, Madam Chair. I'll abbreviate, in the interest of time, my regional comments. Conditions improved in the Fifth District. I didn't pick up the broad, downbeat tone, but I think it's fair to say that reports were mixed in manufacturing. Our composite manufacturing index that came out this morning was marginally positive. Service-sector revenue rose to plus 10, and contacts in retail and nonretail were very positive. Labor markets are strong outside West Virginia, where things are pretty weak. The employment indexes in all of our surveys were solidly positive. In housing markets, the anecdotal comments

were universally positive. Commercial real estate reports were upbeat, notably in D.C., which has been a quite soft market for years. The belief is that the new federal appropriations are going to add to demand for office space. And in some areas, availability of skilled and unskilled construction workers is limiting construction activity.

On the national economy, I agree with the Tealbook's assessment that the outlook hasn't changed much since our previous meeting. In fact, the labor market, if anything, looks better than we thought. We've now reached a point at which the unemployment rate is just one-tenth above the median of SEP estimates of the longer-run normal unemployment rate, just three-tenths above the lower bound of the range of those projections, and, of course, one-tenth below the natural rate estimated by the staff. For me, this suggests that the extent of any underutilization of labor resources is likely to be quite limited now, and, to me, that suggests that there's less scope for further declines in the unemployment rate from here.

In addition, the labor force participation rate is now, someone remarked, within confidence bands of any plausible estimate of trend. Tealbook has it as just $\frac{1}{4}$ percentage point below trend. As demographics are going to be driving labor force participation down over time, I think we should expect little, if any, further boost to employment growth from gains to participation. As a result, I expect monthly payroll employment growth to decline over the next couple of years toward its longer-run trend rate of less than 100,000 per month.

Growth in labor productivity has been relatively low for the past several years on average. If it was to rise, as the Tealbook forecasts, it could offset the decline in employment growth and allow real GDP to continue to grow at about its current pace. This certainly could happen. Productivity growth is notoriously hard to forecast, but I don't see any compelling reason why that's more likely than a continuation of current trends. So, on the basis of all we

know, I think a more reasonable expectation is that labor productivity over the medium term will grow at about the same low rate it has grown over the last few years. A continuation of low productivity growth, together with low employment growth, implies that real GDP growth will moderate over time from its recent average of around $2\frac{1}{4}$ percent to, perhaps, around $1\frac{3}{4}$ percent. In the context of slowing GDP growth, one would expect a moderation of consumption growth relative to the high rates we've seen over the past two years. On the near term, I agree with the Tealbook that we should expect a rebound from the disappointing retail sales numbers in the late fourth quarter. Beyond the near term, I wouldn't be surprised to see consumption growth moderate somewhat.

Growth in business fixed investment was slower last year, and that seems attributable in part to the effects of lower oil prices. The boom in shale oil extraction spawned by oil prices above \$100 a barrel returned oil production to 1980s levels. The decline in oil prices to nearly \$30 a barrel over the past year and a half has resulted in a corresponding investment bust, of course. One should pay attention whenever spending in a significant sector declines so dramatically, but the secondary effects of this bust seem likely to remain limited because oil and gas extraction is a relatively small portion of the economy. I would note that it is far smaller than residential construction: The peak shares of employment and investment connected to oil extraction were significantly smaller than the shares associated with residential construction at the peak of the housing boom.

Moreover, significant adjustment in oil-sector employment and investment apparently has already taken place. Over the longer run, I expect that the beneficial effects of lower oil prices due to reduced costs to energy users is going to outweigh the adverse effects of reduced employment and investment spending in the energy sector. The unexpected decline in oil prices

and further dollar appreciation since the previous meeting have also affected the near-term outlook for inflation. I interpret this the way we've interpreted previous oil and dollar impulses; namely, as another transitory shock to headline and core inflation. It will delay somewhat our return to 2 percent inflation. Having said that, I have to admit, I'm a bit apprehensive about the five-year, five-year-forward TIPS compensation falling below 1.5 percent. I think it's reassuring that estimates of expected inflation extracted from TIPS compensation did not seem to have fallen, but our ability to disentangle expectations from risk premiums is imperfect.

Finally, it's hard to talk about the economic situation without commenting on the recent unpleasantness in equity markets. At a broad level, the sudden decline in equity prices seems way out of proportion with any tangible change in the outlook for economic fundamentals. I agree with others who have made that point. The equity risk premium appears to have risen, as have measures of expected volatility, suggesting that investors, as Nellie said, are placing greater weight on some adverse outcomes, either domestically or abroad.

But these measures haven't moved outside the range of values we've seen over the past several years. So at this point, my modal economic projection is unchanged, although I think it's reasonable to put slightly more probability on downside scenarios. And while I'll be watching equity market developments with great interest in the weeks ahead, I remain mindful of the risk of overreacting to financial market moves that aren't demonstrably connected with weakening economic fundamentals. Thank you, Madam Chair.

CHAIR YELLEN. Thank you very much. Finally, we'll turn to President Mester. And then, I think, although there are a couple of speakers left, I propose we adjourn until tomorrow. Some of our staff are going to have a tough time getting home—and maybe not only staff. [Laughter] So let's do what we can so that people can get on the road. Loretta, though, please.

MS. MESTER. Thank you, Madam Chair. Over the intermeeting period, sentiment among business contacts in the Fourth District turned down and indicators of activity in the energy-related and manufacturing sectors weakened further. On the positive side, the retail and construction sectors showed improvement, and labor market indicators remained strong. Our diffusion index of business contacts reporting better versus worse conditions fell 18 points, from plus 2 in December to minus 16 in January, indicating some softening of business conditions. This decline was driven mainly by reports from contacts in the energy, manufacturing, and freight sectors, which have been under pressure for some time and which are expected to face continued challenges in light of continued declines in oil prices and the rising dollar.

Within manufacturing, the auto sector remains a bright spot. In contrast to President Lockhart's report, the auto producers we spoke with remain optimistic despite weaker sales in December. Our retailers are also optimistic. Their sales toward the end of the year held up well, even as national retail sales were below market expectations. These reports, coupled with the strong labor market, suggest that outside energy and manufacturing, the District economy is likely to continue expanding modestly.

Indeed, the weaker sentiment among business contacts over the intermeeting period is somewhat at odds with these signs from the labor market, which show that firms are continuing to expand hiring at a good pace. District labor market conditions appear to be at levels consistent with full employment. The Cleveland Federal Reserve staff's estimate of year-over-year growth in District payroll employment was 1.4 percent in November, little changed from October but up from a softer reading in September. Employment gains in 2015 were sufficient to push the District unemployment rate down below the national average to 4.7 percent in November, which is well below the minimum of 5.2 percent reached during the last expansion. Reports of

tightening labor markets have spread beyond construction and skilled trades. Firms have reported they're having difficulty filling positions in unskilled occupations, and there are rising wage pressures for entry-level employees in retail. Auto dealers noted troubles hiring qualified sales personnel as well as skilled auto technicians. Bankers reported having trouble filling not only midlevel positions, but also entry-level jobs, such as tellers and phone bank associates.

With regard to the national economy: Economic growth stalled in the fourth quarter, pulled down by net exports and a slowdown in inventory investment. National retail sales in December were also a bit disappointing. The question is whether this softness will last. We also had to evaluate what the recent market volatility might imply about medium-run growth. So I'm not sure what's more disheartening—listening to the financial news stations during episodes of market turbulence, to the local news stations when a blizzard is coming, or to an excerpt of *Rhapsody in Blue* for three hours as you try to rebook a flight during said blizzard. [Laughter]

In any case, declines in global equity markets since the beginning of the year partly reflect market participants' reassessment of the outlook for economic growth in China and their views on how effective actions undertaken by Chinese policymakers will be in fostering growth there. As it relates to U.S. growth, the direct trade ties between the U.S. economy and China are low. But because many emerging economies are considerably more dependent on trade with China, the implications of developments there for the global economy need to be considered.

In addition to the decline in stock prices, we've seen another sharp decline in oil prices. In part, this reflects the same reassessment of global economic growth prospects affecting the stock market, but supply-side factors are perhaps more important. Worldwide oil inventories remain high, and oil production has not been as responsive as one might have thought, in view of the price declines seen over the past 18 months. This means that oil prices are likely to remain

lower for longer than previously anticipated, as it's taken longer for supply to rebalance with demand.

So I ask myself, how should a data-dependent policymaker incorporate the recent developments in the medium-run outlook? Has there been an accumulation of enough evidence to actually materially change the medium-run outlook? And my answer is “no.” The drop in oil prices means that the U.S. energy sector and manufacturing sectors will continue to be under pressure. However, lower energy prices will provide an offsetting benefit for the U.S. consumer and those in other oil-importing countries. Although there's always a possibility that a steeper, more persistent drop in equity markets could lead to a broader and persistent pullback in risk-taking, so far we've not seen this. Indeed, even during some of the recent market volatility, some of my directors reported seeing an increase in risk-taking, driven by low interest rates, rather than a pullback.

At this point, solid labor market indicators, including strong payroll growth, suggest to me that underlying fundamentals remain sound. While I continue to monitor global economic and financial developments and assess their implications for the outlook and risks to the outlook, at this point, I anticipate the U.S. economy will likely work through the latest episode of market turbulence and the patch of weaker data and will regain its footing for moderate growth, even as the energy and manufacturing sectors remain challenged. I continue to expect that economic growth this year will be sufficient to generate some further improvement in labor markets. I see the risks associated with my forecasts regarding economic growth and labor markets as remaining roughly balanced.

The latest round of oil price declines means headline inflation will remain lower for longer than I previously thought, but I still think a reasonable forecast is that inflation will

gradually return to 2 percent over the medium run. Oil prices cannot continue to decline indefinitely, nor can the dollar continue to appreciate forever. At some point, both will regain some stability, and the effects of previous changes on inflation will dissipate. As that happens, with inflation expectations remaining stable—that’s my read of them—and economic growth continuing, I remain reasonably confident inflation will gradually move back to 2 percent. It just may take a bit longer now, in light of the most recent decline in oil prices.

This has got me thinking about our characterization of the inflation outlook. We’ve been saying the effects of the decline in energy prices are transitory, because when energy prices stabilize, the pass-through of past declines in the headline inflation dissipate. However, we’ve now experienced a series of energy price declines, and although each decline has a transitory effect on headline inflation, the effect of the series of declines is longer lasting. If energy prices continue to fall, we’ll need to strike the word “transitory” and make other adjustments to the characterization of our inflation outlook.

Lower energy prices are a downside risk to inflation in the near term but pose an upside risk in the medium run because they may spur stronger-than-expected consumer and business spending in an environment of significantly accommodative monetary policy. My reasonable confidence that inflation will gradually return to our objective over time recognizes there is and has always been large uncertainty regarding inflation forecasts. In many different models, 2 percent is within the 70 percent confidence interval of the inflation forecast for 2017. These models include the Cleveland Federal Reserve staff’s baseline and steady-state Bayesian VAR models, the Tealbook, and several others that have been shown in the literature to perform well, including those of Stock and Watson and Faust and Wright. Of course, the 70 percent confidence interval also includes many lower levels of inflation as well. I wish we were able to

forecast inflation with more precision, but, unfortunately, the state of the science—or, perhaps I should say, the state of the art—isn't there yet. Central bank and academic economists are working hard to improve our forecasting models. In the meantime, policymakers will have to fight against any nihilistic tendencies—here I'm really speaking about myself—and deal with the uncertainty as best we can. Thank you, Madam Chair.

CHAIR YELLEN. Thank you very much. I suggest we quit now to let people get on the road to go home. We'll resume at 9 a.m. We'll try to be expeditious tomorrow, and we should have time to conclude our work. Safe travels, everybody.

[Meeting recessed]

January 27 Session

CHAIR YELLEN.⁷ Okay, folks, let's get started. I think you all have in front of you a handout called "Revised Draft Press Release regarding Statement on Longer-Run Goals and Monetary Policy Strategy." I wanted to spend a moment discussing that.

In light of the fact that President Bullard has dissented, we thought it advisable to rewrite the press release that will accompany the statement and will reflect his reasons for dissenting. So to provide some necessary context, we also made some changes from the short paragraph that was distributed to you with the memo, and I wanted to give you the opportunity to see this before it's released later today. If you have any concerns, I would like to know about them. Maybe you can just spend a second looking this over. It's intended to provide a bit of context on what the Committee was doing in revising the statement. Governor Powell.

MR. POWELL. I have one. Do you want to wait a second to give people a chance to read it, or shall I launch in?

⁷ The materials used by Chair Yellen are appended to this transcript (appendix 7).

CHAIR YELLEN. Go ahead.

MR. POWELL. Focusing on the last sentence, I, too, believe that “the Committee’s concern should be focused primarily on expected future deviations of inflation from the goal.” So to say that that’s a basis for dissent is to say that that’s not what we believe this statement says. I think what President Bullard is really saying is that the statement doesn’t sufficiently point in that direction. The Committee does not have a different concern than the one that’s expressed here. Do you see my point?

CHAIR YELLEN. I do see your point. The problem is that the minutes will come out and will reflect the discussion we had on that, and I think they will indicate that the view of most of the Committee is not inconsistent with President Bullard’s view. However these are not the minutes. This is just a cover sheet for releasing this statement. I think our view—maybe Governor Fischer, President Mester, or others want to speak about this—was that almost everything that’s in here was essentially in the previous minutes, and we vote on the minutes. We didn’t want to get involved in writing a statement that would require a lot of editing and a vote. So we’ve just included some background but are not trying to offer a full discussion, which will later appear in the minutes. Governor Tarullo.

MR. TARULLO. I share Governor Powell’s concern, and, as you say, there would be a three-week period in which members of the public might have a misimpression of what the other 16 members of the FOMC—at least the other 9 members plus the other participants—thought they were voting for. I wonder whether President Bullard might be amenable—it should be his language because it’s his statement—to a change in the formulation, which would at least allow people to infer that this is a difference of gradation rather than a binary issue. I’m just suggesting this language, and, obviously, again, it’s President Bullard’s. But if that last clause

read “but believed the Committee’s language is not adequately focused on expected future deviations of inflation from the goal” or something like that, it might allow him to take his principal position while not leaving people with a false impression of where most of the rest of us are.

CHAIR YELLEN. Another possibility along those lines, if President Bullard is amenable, would be “but believed that the statement should more clearly express that it is primarily focused.”

MR. BULLARD. Yes, I’d be open to either Governor Tarullo’s language or the language that you just gave. I think insufficient focus is my main concern, and I wanted to force that point.

VICE CHAIRMAN DUDLEY. I like the Chair’s language of “express” because, when you characterized your view, it was really about what that sentence said in terms of “were running” versus “expected.” So I think “express” focuses on how it’s more of a language issue than something more.

CHAIR YELLEN. Would that language, then, be acceptable to you, President Bullard?

MR. BULLARD. It sounded acceptable.

CHAIR YELLEN. It is acceptable?

MR. BULLARD. Yes. I’m not sure exactly what it is, but it sounded good. [Laughter]

CHAIR YELLEN. Let me read that language to you: “Voting against was James Bullard, who agreed the Committee’s inflation goal is symmetric, but believed that the statement should more clearly express that it is primarily focused on expected future deviations of inflation from the goal.”

MR. BULLARD. That’s perfectly acceptable to me.

CHAIR YELLEN. President Williams.

MR. WILLIAMS. That's fine.

CHAIR YELLEN. Loretta, are you okay with that?

MS. MESTER. Yes.

CHAIR YELLEN. Is everybody okay with that?

MR. FISCHER. Yes.

MR. LACKER. Madam Chair.

CHAIR YELLEN. Yes.

MR. LACKER. Did it say "should more clearly express that it is"? Is that what you said?

CHAIR YELLEN. Yes.

MR. LACKER. Should it be "the Committee"?

MR. WILLIAMS. No, it's the statement.

MS. BRAINARD. The statement.

MR. FISCHER. It's about the consensus statement.

MR. WILLIAMS. About the statement of the Committee.

CHAIR YELLEN. "The statement is primarily focused"—

MR. LACKER. You mean the statement?

MS. MESTER. You could say "but believed that the statement should more clearly express."

PARTICIPANTS. Yes.

CHAIR YELLEN. That "it is," or "the Committee is"? That "it is primarily focused"?

MS. MESTER. That "the Committee is primarily focused."

CHAIR YELLEN. So maybe it should be “the Committee.”

MS. MESTER. Right.

CHAIR YELLEN. Let’s try that again: “the Committee’s inflation goal is symmetric, but believed that the statement should more clearly express that the Committee is primarily”—

MR. LACKER. Right.

MS. MESTER. Right.

MR. WILLIAMS. No.

MR. EVANS. You’re starting to talk about Committee actions at that point.

PARTICIPANTS. It’s the statement.

CHAIR YELLEN. “But believed that the statement should more clearly express that”—
what?—“the Committee is primarily focused” or—

MR. LOCKHART. “That the Committee’s primary focus be on expected future deviations.”

MR. WILLIAMS. No.

MR. LACKER. Madam Chair, could we try the passive voice, because it avoids that. “It should more clearly express a focus on” or “a primary focus on.”

MR. POWELL. Dan’s language avoided this whole mess.

MR. WILLIAMS. Yes. We were good before.

MR. POWELL. “But believed the Committee’s language is not adequately,” or maybe “the statement language is not adequately focused on expected future deviations.”

VICE CHAIRMAN DUDLEY. How about “sufficiently” rather than “adequately”?

CHAIR YELLEN. “That the statement language is not”—

MR. POWELL. —“sufficiently” or “adequately focused on expected”—et cetera.

MR. WILLIAMS. It's his view, so Jim?

MR. TARULLO. Yes, it's Jim's, in the end.

MR. EVANS. Well, he's characterizing the difference between how he sees it and the Committee's so he's in effect also characterizing the Committee's view by saying it this way.

CHAIR YELLEN. Okay. Let's try this, and this obviously requires President Bullard's consent: "Voting against was James Bullard, who agreed the Committee's inflation goal is symmetric, but believed the statement language is not sufficiently focused on expected future deviations of inflation from the goal."

MR. BULLARD. Yes, I agree with that.

CHAIR YELLEN. President Mester.

MS. MESTER. Can I offer one thought? Could you say "the amended language," because you're not wanting to reopen the whole statement?

MR. WILLIAMS. Yes.

MR. BULLARD. That's a good addition.

MR. FISCHER. Yes, "the amended language."

CHAIR YELLEN. "But believed the amended language is not sufficiently focused."

MR. BULLARD. Right.

CHAIR YELLEN. Is everybody content?

MS. BRAINARD. Yes.

MR. FISCHER. Yes, thank you.

VICE CHAIRMAN DUDLEY. Good. Thank you.

CHAIR YELLEN. Okay. Thank you very much, and thank you, President Bullard, for working with us on this.

We'll now return to the economic go-round with a few speakers left, and we're going to start with President George.

MS. GEORGE. Thank you, Madam Chair. The 10th District economy continues to grow at a modest pace, with weakness in commodity prices and a stronger dollar weighing on sectors like agriculture, energy, and manufacturing. District manufacturing activity has now contracted in 9 out of the past 10 months, and prices of all major crops grown in the District are at or very near their 12-month lows and considerably below prices three years ago. Concerns at District energy companies also have risen, as oil prices fell further below breakeven levels, hedges continued to roll off, and financing to the sector tightened. In our fourth-quarter energy survey, more than 80 percent of respondents now expect a large increase in defaults and bankruptcies this year for those oil and gas companies with exceptionally high debt levels.

Other than those in these sectors, District contacts remain relatively upbeat about the outlook for 2016, primarily in construction and retail, travel, and leisure. One District contact in the nonprofit sector noted for the first time that charitable giving is up and the demand for food and shelter services has declined.

My outlook for the national economy is little changed since our December meeting. I expect moderate economic growth this year as temporary weakness from the fourth quarter of last year dissipates. Consumption and labor market gains continue to be the primary sources of strength in my forecast. Fundamentals remain supportive for consumption. Debt service ratios remain low, household wealth remains at high levels, saving rates are higher, gasoline prices are low, house prices are rising, and the labor market continues to improve. However, if households pull back amid the current market volatility and other uncertainties, as highlighted yesterday in terms of downside risks, then this year would likely see only modest economic growth.

I note that confidence among the top third of income earners from the University of Michigan survey has been slipping for several months and is now about equal to the rising confidence of middle-income households, a somewhat unusual occurrence that likely reflects the volatility in financial markets. Still, the empirical evidence suggests to me that households make only modest adjustments to their spending in response to higher uncertainty, and that these kinds of developments don't necessarily translate into weaker consumption growth.

In terms of the labor market, continued improvements seem likely to support economic growth. In December, the level of activity component of my staff's labor market index went above its long-run average for the first time since the crisis. While my forecast of the unemployment rate depends on continued improvement in the labor market, I expect some lower job growth numbers in the next few months, in light of how strong we assessed the release in December to be. A number of sectors saw December job gains at or near the tops of the ranges seen over the previous 12 months, so I won't be surprised to see payroll growth below what we've seen over the past few months.

Finally, I expect that the decline in oil prices and dollar effects will continue to be a headwind for inflation, a headwind that has proven to be more persistent than fleeting and appears to be affecting five-year, five-year-ahead breakevens. While the stability of survey-based longer-term inflation expectations is reassuring, longer-term inflation expectations bear watching. Thank you.

CHAIR YELLEN. Thank you very much. President Kashkari.

MR. KASHKARI. Good morning. Thank you, Madam Chair. The Ninth District economy is growing moderately but unevenly, and employment is strong in the District overall. In the Twin Cities, the seasonally adjusted unemployment rate in November was 3.2 percent—

pretty strong. Our business contacts continue to report difficulty finding skilled and specialized workers. However, the strong dollar is weighing on exports of manufacturers and farmers, and low commodity prices are reducing incomes and activity in the oil, mining, and ag sectors.

Let me offer two anecdotes from the region that I think the Committee may find interesting. First of all, we have the Bakken oil field, and some of our contacts there expressed a great deal of optimism that prices are going to rebound quickly. When pushed, there wasn't a lot of analysis underlying that optimism. I would call it more of a hope. But it's a good reminder that not all market participants adjust immediately when prices move in a painful direction for them. The adjustment can take time before they fully embrace it.

The second anecdote I'll offer is that I'm pleased to report that I was able to get a mortgage. [Laughter] I went through the whole process, from soup to nuts. I was concerned when Chairman Bernanke famously was turned down for a refinance, so I thought, what hope did I have? But I've got to tell you something: It is a painful process. I went through it like anybody else. The amount of documentation that I had to provide was shocking to me. So the good news is, the mortgage market is open. The good news also is, the banks are taking the new regulatory environment very seriously, but it's not for the faint of heart.

The national economic picture is similarly mixed. Concerns about China's economic growth outlook and policy decisions and about other global risks, as we've noted, have destabilized financial markets. As of last night, the S&P is down, I think, 7 percent since the start of the year. Volatility has risen, credit spreads have widened considerably, and longer-run market-based measures of inflation expectations have fallen to new lows.

As we discussed yesterday, financial markets can be leading indicators. We have to consider the possibility that these developments are signaling higher odds of an economic

downturn, especially one that's accompanied by low inflation. The U.S. economy does show substantial underlying strength, especially in the labor market, so it's far from certain that the international volatility we see is going to directly affect us.

In summary, I share the Tealbook's baseline outlook for gradual improvement in the economy, but uncertainty has risen. We don't know how hard a landing China will have, we don't know how effectively China's policymakers will deal with that landing, and we don't know how events in China will spill over to the United States. So I feel that we must be prepared to respond to a wide range of potential outcomes, including those downside scenarios. Thank you.

CHAIR YELLEN. Thank you very much. Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you, Madam Chair. My views have changed somewhat since the December FOMC meeting. While I still think the economy will grow at a slightly above-trend pace in 2016, the recent foreign and financial market developments do make me more concerned that economic growth could disappoint. Also, inflation seems likely to stay lower for longer, due to lower energy prices, a stronger dollar, and inflation expectations that seem less well anchored than earlier.

Starting with the economic growth side of the ledger, I think we've had a bit more negative news than positive news since the December meeting. On the positive side, payroll gains have been strong, and household real income remains on a sturdy trajectory. Moreover, fiscal policy is likely to provide support to the economy in 2016. But this has to be set against the softness in real GDP growth, the weakness of the factory sector, soft foreign activity, and significantly tighter financial conditions. While my baseline view is that consumer spending will strengthen and real GDP growth will rebound this quarter as the drag due to the behavior of

inventories lessens, if this doesn't fully materialize, then I'd be concerned that we might see a significant slowing in payroll employment growth and, with it, a weakening in what's been a very favorable trend for household real income.

On the inflation side, the outlook has also deteriorated, in that the transitory effects of lower energy prices and non-energy imports look likely to prove more persistent. As many people have noted, inflation expectations obtained using survey data remain weak, and the five-by-five inflation compensation obtained from the spread between nominal Treasury yields and TIPS yields continues to decline. Now, that said, if the rebound in economic growth does materialize, then I think inflation will gradually move up as labor market utilization continues to tighten. The fact that the core inflation measures have been pretty stable, despite the sharp deflationary impulses we've seen, supports that conclusion. But it is very important that above-trend economic growth does, in fact, materialize.

Although the sharp and abrupt tightening we've seen in financial market conditions is difficult to reconcile with what still seems to be a relatively good U.S. economic outlook, we do have to recognize that there are underlying causes—the slowdown in China, the collapse in energy prices, and the pressure on many EME economies. It's not just animal spirits, so I wouldn't completely dismiss it. The fact is that the strains we're seeing have intensified since August. Also, the shift in our monetary policy regime may also play a role. There's a lot more uncertainty now about the path of short-term interest rates, for example. Now that we've lifted off, I would expect financial asset prices to be more volatile. So liftoff probably has played a role, even though some of the other factors I've cited seem more important to me.

The key issue for me is, will the tightening in financial market conditions prove persistent, or will it intensify further? I don't know the answer to that. So let me review the

major financial market components and what my current thoughts are on that. The equity market has been very volatile and down more than 10 percent from its peak and about 7 percent since year-end. I view the main cause here as the lack of earnings growth due to a stronger dollar and negative foreign earnings translation effects, poor productivity growth, and a tightening labor market. The problem, to me, is not that equities are overvalued relative to bonds. Equity risk premiums are not unusually narrow. But, instead, the problem is the lack of visibility in terms of future earnings growth.

Credit spreads have widened considerably. What's happening in the energy sector is pretty straightforward. The key issue is what to make of the widening elsewhere. To me, the key question is, how much of this widening just represents spillover from the energy sectors and outflows from bond mutual fund bleeding to selling pressure versus a regime shift in which the price of leverage has gone up? Leverage in the corporate sector increased in recent years as companies actively sought to lever up to boost their returns on equity and their stock prices. Companies were responding to an environment of record-low interest rates and narrow credit spreads, but now the situation may be reversing. The price of leverage may be going up, so, as a consequence, this widening in credit spreads could turn out to be persistent.

In terms of the dollar, the outlook in the United States continues to be better than elsewhere. Chinese officials have made it clear the RMB is no longer pegged to the dollar, and I imagine that, if the RMB is allowed to weaken, this is likely to lead to currency weakness elsewhere. President Evans and I were having a conversation at breakfast today, and I think he made a really interesting point. If things evolve in line with the Tealbook forecast—an interest rate path that's above the market consensus—one consequence of that would probably be a dollar that's also firmer than expected. So we need to understand that, if the interest rate path

materializes as we envision it, dollar strength is probably going to continue, especially in light of the fact that Japan and Europe are continuing to add to quantitative easing rather than pulling back from that.

The key issue, to me, is whether this is a temporary squall that will soon reverse or something that will prove more persistent. If the tightening in financial conditions reverses, as it did last fall, then it probably doesn't have implications for what we're going to do or not do at the March meeting. But if it does prove persistent or intensifies further, then the case for tightening would be a lot less compelling because the tighter financial conditions would, over time, imply slower growth and lower inflation, all else being equal. Thank you, Madam Chair.

CHAIR YELLEN. My thanks to everyone for a thoughtful round of comments on the incoming data, the outlook, and the associated risks. If I might, I'd like to wrap up with a few comments of my own, including some observations on the policy implications of the outlook and the uncertainties we face, anticipating our next round of discussion.

Starting with the data we've received on spending, production, and the labor market, as many around the table commented, incoming readings on real activity have been quite mixed and almost seem to tell a tale of two economies. Thus far, the labor market has been doing very well, although the move up we've seen in UI claims may conceivably be a harbinger of a weaker job market ahead. The unemployment rate has changed little in recent months but is at a level only a little higher than my estimate of its longer-run level. And the recent stability reflects a welcome combination of solid gains in household employment and a pickup in labor force participation. As a result, the employment-to-population ratio rose over the fall, even as its underlying trend continued to drift down. Finally, average hourly earnings in December were up 2½ percent on a 12-month change basis, which is a considerable improvement from a year ago, even if the pace

remains subdued. Now, because of the noisiness of compensation indicators, I don't want to read too much into this pickup, but perhaps it hints that diminished labor market slack may be finally showing through to wages.

On the other hand, incoming data on overall real activity have been disappointing, to say the very least. Manufacturing output barely increased last quarter, and recent readings from business surveys are weak. Retail sales declined in December and were up only modestly, on net, over the fall. As for overall activity, whereas I had anticipated that real GDP would expand more or less in line with potential output in the fourth quarter, the staff now estimates that it rose at an annual rate of less than $\frac{1}{2}$ percent. For me, a particularly worrisome aspect of this near stall is the contribution of consumption, which had been one of the few sources of strength in this economy. But consumer spending now appears to have risen at an annual rate of only $1\frac{1}{2}$ percent last quarter, down from a 3 percent rate in the third quarter, despite strong real income gains from rising employment and falling energy prices.

In trying to make sense of some of these mixed signals, I take some comfort that transitory factors explain some of the weak GDP growth. As David noted yesterday, part of the slowdown in consumer spending was a result of unusually warm weather that held down outlays on energy services, and the likely snapback in the level of that spending component this quarter should boost overall GDP growth. In addition, changes in mortgage reporting rules appear to have caused a temporary blip down in home sales and thus sales commissions last quarter. Consistent with this assessment, existing home sales rebounded strongly in December. Finally, the estimated sharp slowdown in inventory investment last quarter probably is a one-time adjustment of stocks, with no lasting implications for overall GDP growth, although, in this case,

one cannot dismiss the possibility that it could signal a more persistent scaling back of firms' production plans.

For these reasons, I'm inclined to discount the recent spending and production data in judging where the economy is probably headed in the near term and rely more on the labor market indicators themselves. De-emphasizing the GDP data also makes sense, as they're noisy indicators, prone to substantial revisions, and, as David noted, simply just not that informative in predicting near-term labor market developments. For example, econometric analysis reveals that, in forecasting the current-quarter change in the unemployment rate, one can completely ignore lagged GDP growth and simply rely on last quarter's change in the unemployment rate. That said, I did hear comments around the table indicating that a number of you noted that your business contacts saw a slowing in economic activity toward the end of the year, and that obviously bears watching.

Even if we significantly discount the relevance of the slowdown in fourth-quarter GDP to the outlook for economic activity and the labor market, we should not dismiss the implications of recent developments in financial markets and the global economy. Since our December meeting, as many of you noted, the stock market is down about 7 percent. Risk premiums on corporate bonds have increased notably, banks reported tightening terms and standards on C&I and CRE lending in the most recent SLOOS, and the dollar has appreciated an additional 2½ percent.

According to FRB/US, the net GDP effects of the rise in the dollar, the fall in stock prices, and the movements in longer-term interest rates are roughly equivalent to an increase in the federal funds rate of at least 50 basis points, assuming that the changes in asset prices persist. Now, of course, they may not, and the imprint of lower stock market wealth on the Tealbook projection is less than it might be, because the staff projects some of the recent decline to be

reversed over time. In addition, lower oil prices and the resulting boost to real income and consumer spending provide a partial offset, although the net boost to GDP will likely be tempered by a further reduction in domestic drilling activity and slower economic growth in Canada and Mexico, two of our biggest trading partners. Beyond these conventional effects of changes in financial conditions, I also worry that a more unusual dynamic may now be at work, especially as recent market developments seem disproportionate in light of the staff's quite small downward revision to foreign economic growth. Perhaps this pronounced jitteriness partly reflects fears that some countries and firms are near a tipping point, past which further declines in commodity prices could lead to a highly nonlinear deterioration in conditions, with quite adverse effects for the global economy.

In addition, markets seem concerned that central banks may be reaching their limits in terms of the support they can provide to the economy. Whatever the underlying reason, we need to be careful that our own communications do not make the situation worse. Currently, many financial market participants appear concerned that we will respond too inertially to the evolving downside risks. In view of the fact that we raised rates in December, they may fear we'll be insufficiently responsive to these intensifying risks and particularly resist a policy reversal, even if the incoming data are quite weak.

Given our consensus on the importance of being data dependent, I don't believe that we would actually make such mistakes. But if we aren't careful in our public statements, we could strengthen the market's fears on this score. I think we need to be particularly careful that we do not inadvertently leave the impression that we're being overly dismissive of adverse global developments. Such a misperception could result in further dollar appreciation, increases in risk premiums, and declines in oil and other commodity prices. But, at the same time, we don't want

to make the opposite mistake of overreacting, thereby making matters worse, by conveying panic or an unduly pessimistic shift in our outlook. Achieving this balance is clearly our task today, and that is the objective of the revised version of alternative B.

Obviously, the recent appreciation of the dollar and decline in oil prices also have implications for inflation. Once again, we will have to wait longer for the transitory influences of these factors to fade. According to the current Tealbook, core inflation is now projected to remain near 1¼ percent on a 12-month change basis through the end of this year, while headline inflation is expected to remain below 1 percent. I think that, in continuing to predict an eventual pickup in inflation, we risk sounding like Wonderland’s White Queen: “The rule is, jam tomorrow and jam yesterday—but never jam today.”

There are good reasons for monetary policy to look through the transitory inflation effects of price shocks, and that approach served us well from 2004 through 2008, when, year after year, unexpected increases in oil prices caused headline inflation to be persistently elevated. But there are at least two caveats. First, shocks of this sort can have persistent contractionary effects on real activity, to which monetary policy should respond. And this is clear in the case of dollar appreciation, fueled by flight-to-safety concerns. The shock not only puts downward pressure on inflation but also restricts economic growth by reducing net exports. While oil price declines are normally viewed as a plus for U.S. real activity, there is a risk that the tipping point effects I mentioned earlier may have reversed the sign in present circumstances. The second caveat is that one better be sure that the transitory influences aren’t starting to have persistent effects on inflation expectations. In this regard, it does worry me that longer-run inflation expectations in the Michigan survey are now at the bottom end of their historical range, and that inflation compensation has now declined to a historically low level, well below our 2 percent

objective. Developments in this area need to be closely monitored and considered, as we emphasized in our December statement.

Let me stop there and turn over the floor to Thomas for his policy briefing.

MR. LAUBACH.⁸ Thank you, Madam Chair. I will be referring to the handout labeled “Material for Briefing on Monetary Policy Alternatives.”

Your policy decisions today center on whether economic and financial developments over the intermeeting period warrant modifying the Committee’s assessment of the medium-term economic outlook, the risks to that outlook, or both. Alternatives A, B, and C present essentially the same modal outlook for economic activity and the labor market but different assessments of the outlook for inflation and of the risks attending the economic outlook, along with corresponding policy choices—specifically, whether to increase the target range for the federal funds rate and whether to indicate any change in the likely future path of the policy rate.

Developments over the intermeeting period apparently led market participants to see a greater likelihood that the real economy and inflation will evolve in ways that will warrant even more gradual policy normalization than investors had anticipated earlier. The federal funds rate path implied by futures shifted down noticeably, as shown in the upper-left panel. And even though the median dealer’s modal path for the funds rate did not change materially, dealers now see a higher probability of a lower target range for the federal funds rate at the end of this year, suggesting that they see greater downside risks to the economy than in December. For example, as shown in the upper-right panel, since December, a number of dealers have raised the odds they assign to the U.S. economy being in recession in six months. In dealers’ written responses, financial market developments and risks to economic growth abroad, particularly in China, were the most frequently cited reasons for respondents having raised their probabilities of recession.

One key issue confronting you is whether to continue to describe the risks associated with the outlook for real activity and the labor market as balanced, as in alternative C, or whether to withhold judgment for the time being—as in the revised version of alternative B that was distributed on Monday, and that is shown in your handout—or to describe those risks as tilted somewhat to the downside, as in alternative A. The middle two panels examine the downside risks to real activity from a number of perspectives. The panel on the left shows estimates of the probability that real GDP will decline this quarter and next; these results, which are also reported on page 77 of Tealbook A, are derived from several staff models and are independent of the staff baseline forecast. The first three estimates continue to show very low probabilities and are little changed since the December Tealbook. However, these particular estimates do not take into account the recent turbulence in global financial markets, because the models either condition on financial data only through

⁸ The materials used by Mr. Laubach are appended to this transcript (appendix 8).

the fourth quarter or largely exclude such information altogether. In contrast, the fourth estimate shown in the table, which is derived from a factor model that does incorporate information on a range of financial variables, shows not only a noticeably higher probability of a recession, but also that it has risen some since December.

In an attempt to expand on the financial dimensions of this analysis, the Board staff estimated two different probit regressions, each of which attempts to calculate the probability of the U.S. economy entering an NBER-defined recession sometime during the next six months as a function of one or more financial indicators. This is the panel that has been telegraphed beforehand. The first regression employs the excess bond premium, or EBP—a measure of the average credit spread net of default risk for the outstanding senior unsecured bonds of nonfinancial corporations. The EBP can be interpreted as an aggregate credit risk premium, and its developers, Simon Gilchrist and Egon Zakrajšek, find that it is a good predictor of GDP growth. As shown by the black line in the middle-right panel, the probability of a near-term recession implied by the EBP has risen steadily since last spring and now stands at almost 70 percent. A somewhat less alarming picture is presented by the second probit regression, which replaces the EBP with a summary statistic of a wide range of financial variables. By this measure, and as shown by the red line, the estimated probability of near-term recession has increased sharply since the turn of the year and now stands at 40 percent. Of course, any estimate of this sort should be taken with a large block of salt: These regressions are estimated using long time series because recessions occur infrequently. The regressions may therefore fail to pick up the evolving structure of financial markets and changing relationships between the explanatory variables and the probability of recession. More generally, economists' failure to predict recessions is notorious, and, as the old saw goes—and here I'm using the old, Samuelson numbers—the stock market has predicted nine of the past five recessions. For these and other reasons, you may judge it premature to draw conclusions about the balance of risks to real activity.

The bottom two panels present information relevant to your decision about how to characterize the outlook for inflation and the risks to this outlook. All three of the draft alternatives acknowledge that inflation is likely to remain low in the near term due in part to the drop in energy prices. They differ in the degree of concern they express about the downside risks to the inflation outlook. The new language in alternative B stating that the Committee is closely monitoring the implications of global financial and economic developments clearly indicates concern about risks to the inflation outlook but does not suggest a change in the modal outlook that inflation will move back to 2 percent over the medium term. By contrast, alternative C states that the Committee remains reasonably confident that inflation will move back to 2 percent over the medium term, while alternative A indicates that inflation will remain below 2 percent longer than previously anticipated.

A significant number of forecasters and market participants appear to have marked down their inflation projections. The exhibit in the lower left shows that the dealers have pushed out expectations for a firming in core inflation. Like the staff judgmental forecast, dealer forecasts for core inflation this year, which had stepped

down during the fall, have again moved lower, likely reflecting the sharp drop in oil prices over the intermeeting period and the further appreciation of the dollar. Most dealers still see core inflation in 2017—not shown— as making more progress toward the Committee’s objective than the staff does, but a number appear to see a risk that low inflation will persist longer, perhaps along the lines of the staff baseline. Several of the staff’s statistical models also show an increase in the risk of persistently low inflation. The bottom-right panel reports the probability that the four-quarter change in total PCE inflation will be less than 1 percent four quarters from now. The probability calculated using the FRB/US model increased notably since December, while estimates from EDO, one of the Board staff’s DSGE models, and the Bayesian VAR model are still quite low.

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

CHAIR YELLEN. Thank you. The floor is open for questions. President Evans.

MR. EVANS. In the chart Thomas presented with the probabilities on the excess bond premium, it looks like there were a couple of spikes in 2002 and 2004. I think the 2002 is probably Enron, WorldCom, and all of that, but what about 2004? It gets up to about 40 percent.

MR. LAUBACH. Yes, I think the salient point is, of course, that these are somewhat noisy indicators of recessions, so there are false positives in here as well. The excess bond premium is constructed from literally a very large universe of outstanding corporate bonds, so there may be particular factors like corporate governance scandals. More recently, you may wonder what role, for example, energy firms are playing in driving that particular variable, and that was the intention of then moving to the red line. Now, the red line, too, gives you some movement, as you point out, especially in late 2002. If I recall correctly, that period actually wasn’t an NBER recession but saw substantial financial stresses in many areas. It’s clear that when you base this indicator on financial variables, you may get a false positive.

MR. EVANS. But nobody remembers the headline in 2004 that is likely responsible for that little spike?

MR. LACKER. The increase in rates?

MR. EVANS. Well, it could be. It's too early for the conundrum to have 10-year rates drop out. Okay. Sorry.

MR. LAUBACH. Yes, I would be surprised. Again, this thing is constructed on the basis of the expected excess returns on holding corporate bonds over Treasury securities. So I don't know whether they responded very strongly to the tightening.

CHAIR YELLEN. President Bullard.

MR. BULLARD. Thank you, Madam Chair. I just want to understand your presentation. In this panel on the middle left, "Probability of Recession in 2016:H1," what I'm understanding is that the Tealbook says 1 percent, and then these other charts, though, are six months ahead. So you're talking about the second half of 2016.

MR. LAUBACH. No. The calculations on the right are the probability of being in recession either already now or within the next six months.

MR. BULLARD. Does that mean the recession would begin then?

MR. LAUBACH. Exactly.

MR. BULLARD. So it could begin in July, and then that would be okay, according to the model?

MR. LAUBACH. Yes. I have to confess that I'm not quite sure whether we picked the window of January to June or February to July, but it was one of the two. But if, say, you were thinking a recession might begin later in the year, in the late fall or something like that, it would not be captured in these regressions. They ask about now or in the next six months.

MR. BULLARD. Okay. So these three charts, the recession probability charts, are meant to be comparable.

MR. LAUBACH. As much as possible.

MR. BULLARD. Okay. And the Tealbook is wildly lower than the other probabilities. So explain that to me.

MR. LAUBACH. The Tealbook is not actually shown.

MR. WILCOX. What are you referring to?

MR. BULLARD. FRB/US. Sorry.

MR. WILCOX. Just to create a little space here, that's different from the Tealbook.

MR. BULLARD. I know. Sorry.

MR. WILCOX. Just for clarity.

MR. BULLARD. I stand corrected. Go ahead.

MR. LAUBACH. The FRB/US number is based on stochastic simulations, and it's computing the probability, the number of draws or the percentage of draws for which you get a decline in real GDP in both Q1 and Q2.

MR. BULLARD. Well, another question would be the unconditional probability of going into recession at any particular date, and FRB/US would seem to have a very low number for that, whereas the other models would have something like 10 or 15 percent all of the time.

MR. LAUBACH. I think this is a fair point that these models may have different steady-state probabilities of going into recession. That is right. Now, in the case of FRB/US, my guess—so please take it with a grain of salt—would be that it takes a lot of signal from the strong labor market data. That's really what's keeping it out of recession. But that's a guess.

MR. BULLARD. Okay. Thank you.

CHAIR YELLEN. Are there other questions? President Kaplan.

MR. KAPLAN. Thank you, Madam Chair. I have one question. On the red line, are you looking at absolute levels, or are you looking at the degree of change from a point in time? So,

for example, I noticed you're looking at equity prices and other things. You're not looking at absolute valuation levels, but you're looking at the delta?

MR. LAUBACH. You're taking a bunch of variables that include the VIX. It includes spreads. I'm actually looking for help from Eric Engstrom, who assisted me in that. Could you speak about exactly how the stock market is fitting into it? Thank you.

MR. ENGSTROM. There are actually both level and change variables in the regression. There's a six-month change in the stock market as well as a stock market valuation level, like a P/E ratio, and there are credit spread levels and volatility measures.

MR. KAPLAN. Okay. Thank you.

CHAIR YELLEN. President Lacker.

MR. LACKER. Simple question: How many models did you estimate?

MR. LAUBACH. For this year? For the right panel?

MR. LACKER. You're showing us two. How many did you estimate?

MR. LAUBACH. Exactly these two.

MR. LACKER. No more?

MR. LAUBACH. I do not know how many more models the staff is estimating, but when I asked colleagues, like Eric, to help me put this briefing together, we did not engage in a laborious search. This is certainly an area that many folks across divisions here at the Board are working on, but, no, we did not engage in a particular search. The reason I thought these two would be interesting is because we wanted to present something that was using financial variables in order to get at the question "Should you draw a very different view from the financial information?" And I deliberately wanted to draw a stark contrast in the sense that you

could easily imagine estimating models in which you throw in both nonfinancial and financial variables, and the factor model in the left-hand panel is a bit of that nature.

Again, for contrast, I wanted to focus exclusively on financial variables. Then we thought that two obvious starting points would be, one, just an agnostic thing, which is the red line, for which we drew on a bunch of headline variables that you would normally look at in order to get an overall view of financial conditions. Then the other one, the excess bond premium, is simply quite interesting because of the work that has been done by Simon Gilchrist and Egon Zakrajšek documenting that it is a surprisingly strong predictor of future real GDP growth. Those were just two candidates that came to my mind, but I'm not claiming that they are representative of a larger universe of things that the staff has looked at.

CHAIR YELLEN. Are there further questions for Thomas? [No response] Okay. Seeing none, let's begin our go-round and start with President Rosengren.

MR. ROSENGREN. Thank you, Madam Chair. I support alternative B. We need more time to assess the direct effect of recent financial market volatility on the economic outlook and inflation and, more important, to determine whether the volatility is signaling underlying weakness that is not yet evident in the data.

It is disappointing that the real GDP growth forecast for last quarter has been revised down. I am concerned that we also may be revising down estimates of first-quarter real GDP growth. If we are growing slower than potential, then the median path of the federal funds rate in the December SEP may prove to be too steep. As I highlighted yesterday, I believe the downside risks to the outlook are elevated relative to December. With consumption being an important component of real GDP that could disappoint.

I would also add that if both actual as well as expected inflation are important determinants of actions to be taken in March, it is unlikely that we will have much in the way of evidence of higher core or total PCE inflation by that time. In light of the recent declines in oil prices and the appreciation of the dollar, the Tealbook expects that total PCE inflation for the first quarter of 2016 will be negative, and that core PCE inflation will be 1.2 percent in Q1. In fact, the Tealbook forecast does not have core inflation showing signs of accelerating until next year. If this forecast proves correct, the inflation data will not provide evidence of approaching our 2 percent goal for quite some time. We have plenty of data yet to be received before the next meeting. Nonetheless, in view of recent events, we should be reinforcing the idea that the median SEP is a forecast, not a promise, and that we remain data dependent.

I greatly prefer the new sentence substituted in the second paragraph of alternative B to the previous version of alternative B. It appropriately highlights that we are monitoring recent events for implications on the outlook and the risks to the outlook. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Fischer.

MR. FISCHER. Thank you, Madam Chair. I support alternative B in the version with the revised wording at the end of the second paragraph. This gives the right combination of concern over recent developments and calmness in deciding how to appraise them and how to react to them at later meetings. Although a lot has happened so far in January, this is not the time to change course. We continue to be faced by the combination of a strong labor market and disappointing real spending, with the recent addition to the mixture of considerable financial market volatility. We're not expected to change the federal funds rate at this meeting. And, at least in this regard, we should not disappoint expectations. Rather, we should, in the words of

alt-B, closely monitor “global economic and financial developments” and assess “their implications for the labor market and inflation, and for the balance of risks to the outlook.”

Our discussions yesterday and today started from the current combination of a labor market that has performed relatively well and that must be near maximum sustainable employment, and, at the same time, the staff’s forecast of PCE inflation for 2016 that is only 0.7 percent, with even the forecast of the core PCE inflation at 1.3 percent. The discussion yesterday went on to detail the background to this situation: the large depreciation of the dollar; the ongoing declines in the price of oil; the recent declines in asset and commodity prices; and the fears, particularly of asset market participants, that China’s economic growth may decline more rapidly than the official predictions, and that the exchange rate of the renminbi may depreciate more than the authority’s pronouncements about it would suggest. There was concern over Japan, which may want a weaker exchange rate, and the euro zone, which makes no bones about that.

Aside from the market volatility, these are not especially new facts. Nonetheless, like the markets, the FOMC was in a distinctly less optimistic mood yesterday than it had been only six weeks ago. It was striking that the basic view about inflation that had obtained among many of us until now—that inflation has been held down by temporary factors, especially declines in the price of oil and the appreciation of the dollar—appeared to be losing ground. Simply put, the view I thought I heard from some of you was that we’ve been surprised too often by low inflation, and that we should accept low inflation as a better description of the underlying state of the economy than the view that inflation is low primarily because of temporary factors.

I do not believe that. True, we have continually been surprised by oil price declines. So has almost everyone, including the Saudis. That does not mean that the temporary oil price

declines and their consequences are not a major factor underlying the behavior of prices. Similarly, the appreciation of the dollar has had an influence on even core PCE prices. Among the consequences of declines in the price of oil is the decline in expected inflation. Those who worry about inflation losing its expected-inflation anchor need, at present, to look no further than the behavior of the price of oil. Those who ask why core PCE inflation is 1.3 percent rather than closer to the target of 2 percent will find that a significant share of that 0.7 percent gap is taken up by the influence of oil prices and the appreciating exchange rate on core inflation. Now, one may well ask why movements in energy prices are correlated with expected inflation and core PCE inflation, and everyone is asking. There are explanations for both these phenomena, but there is a clear need for further research on these topics. And I'm sure that WE9, which is Wilcox exhibit 9, marks a good start in getting an answer to that question.

Where would we be if we accept, as I do, the view that inflation will gradually rise to its 2 percent target if labor markets continue to be strong, with unemployment remaining close to the natural rate? We would essentially remain with the forecast we had last month, which is close to this month's Tealbook forecast. We would continue with our approach of gradual increases in the federal funds rate at a rate that depends on incoming data and without any commitment to a fixed number of increases per period.

What if that view turns out to be wrong and the labor market starts weakening and the unemployment rate moves up in a sustained way? I think it's premature to start talking seriously about that possibility now, but it is not premature for the staff to start researching that situation and possible courses of action to deal with it. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Lockhart.

MR. LOCKHART. Thank you, Madam Chair. I support the substance of alternative B. As regards the statement language, the objective should be to position the Committee as agnostic about a March policy action but to be careful not to rule out March. While I have some sympathy with the alternative A language that the Committee sees risks “tilted slightly to the downside,” I think the better communication strategy is to avoid explicitly making that declaration. To shift the risk assessment to the downside at this meeting would signal, in my opinion, that a rate increase at the March meeting is quite unlikely, and I think it is too early to make such a call.

Regarding the notion in the new alternative B language of omitting an explicit balance-of-risks assessment, yesterday I heard quite a number of comments that the balance of risk may have tilted to the downside. I think this presents a tricky communication situation. Avoiding an explicit assessment of risk will be noticed and give rise to lots of commentary. It is a departure from past practice. It could also be taken as a signal regarding March. So, all things considered, I am leaning, after thinking about it over the weekend, toward just sticking with the language in the memo on alternative language circulated on January 20 premising that it’s simply too early, and it’s premature to make an adjustment to the downside in the Committee’s official stance on the balance of risk.

I have a couple of more comments. Strict adherence to data dependence makes us, to an extent, tethered to the data calendar. I can imagine incoming data leading up to the March meeting that continue the run of ambiguous signals. We have two more employment reports before the March meeting. A soft reading on the labor market, along with weakness in the spending data, could give pause.

I commented in the economic go-round that inflation data are likely to be messy through the middle of the year. The February CPI data will arrive on the second day of our March meeting. Although, as I said, I'm not ready to send any signal that a rate increase in March is off the table, I am anticipating that a rate move in March could feel premature and unsupported by evidence. If that's the situation, I expect I will be comfortable waiting until April for more data that confirm, I hope, that the outlook is holding up. In some respects, I think it would be a healthy departure to move in April to reinforce that every meeting of this first phase of normalization is live. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Harker.

MR. HARKER. Thank you, Madam Chair. Consistent with my economic forecast, I support alternative B for this meeting. Labor markets have continued to improve, and inflation is likely to be held back by energy prices and dollar appreciation over the near term. But survey-based measures of inflation expectations have remained steady, and I expect that oil prices and the dollar will stabilize in the months ahead.

Monetary policy—and I think it's important to remind myself—remains accommodative, and a cautious approach seems appropriate in view of the economic and political uncertainties that we face. I've advocated a gradual normalization of policy that is data dependent, and the current data and forecasts suggest to me that no change in our policy stance is warranted at this meeting. While my own view is that the risks to the economy are largely balanced or slightly to the downside, I'm fine with the proposed language in paragraph 2.

There's a large and growing divergence of the federal funds rate path in both the Tealbook forecast and the central tendency in the SEPs from the implied funds rate path from the financial markets. Looking ahead to our next few meetings, we may find ourselves in a situation

in which the labor market continues to be relatively strong while realized inflation runs at a slow pace. My own view is that such a scenario would call into question the suggested path of our normalization. Fortunately, I believe we take care in the statement to say that our policy decisions are data dependent. However, in the event that there is ongoing tension between our employment and inflation goals, we may need to provide more guidance about how these tensions will be resolved and what that implies for the future course of monetary policy. Personally, I would need to see convincing evidence that inflation is once again moving toward target, and that is unlikely to occur this quarter. In any event, on account of the disconnect between the policy rate path we have in mind and the policy rate path expected by financial markets, it's important to think about what we would have to see to choose to resume our rate increases.

Lastly, I'd just reiterate a comment I made a few meetings ago, which President Bullard referred to yesterday—Q1 GDP data are notoriously difficult to interpret due to seasonal adjustments. And I encourage the Committee to take that with—I don't know if it'll be a block of salt or a grain. Let's call it a cube of salt. Thank you, Madam Chair.

CHAIR YELLEN. Thank you very much. Governor Brainard.

MS. BRAINARD. Thank you, Madam Chair. Financial conditions have tightened considerably since we last met, and market-based measures of inflation expectations have taken another sizable step down. Equity prices have fallen roughly 7 percent, and credit spreads have widened. The trade-weighted real exchange rate appreciated a further 3 percent, bringing the total real effective appreciation to 20 percent, roughly 1 percent a month since the summer of 2014. As noted earlier, the financial tightening in this period is roughly equivalent to two additional hikes in the federal funds rate.

Over the course of the movements in the exchange rate and oil prices, we have repeatedly noted their transitory nature and stated our willingness to look through them. As I discussed yesterday, the factors holding down inflation have proven to be persistent and appear to be related to global forces that are also persistent. In particular, it would be unwise to dismiss the fluctuations in China's financial markets as either one-offs or unlikely to perturb global markets sufficiently to matter for the U.S. outlook.

As China changes the composition of its economic growth trajectory, it is having material effects on commodity producers, which are being amplified in countries whose growth was accompanied by rapid increases in debt. China is also undertaking a notable shift in its exchange rate regime, a departure from earlier financial crises, when it hardened rather than loosened its commitment to a peg. As China adjusts its exchange rate and attempts to work off large imbalances in its financial markets, this could lead to periodic bouts of volatility with possible amplification associated with post-crisis changes in financial market functioning.

Eighteen months of repeated step-downs in oil prices and step-ups in the exchange rate risk exerting a disinflationary force in the medium-term framework in which we are making policy. These may well have important implications for policy when they are accompanied by a significant deterioration in measures of market-based inflation expectations, as we've seen, and some hints of softening in survey-based measures. From where we sit today, in light of the extent of deterioration we've seen to an inflation outlook that was already raising concerns and to measures of inflation expectations, I think it's unlikely that we would see a set of data that would give me enough reassurance in the intermeeting period to justify an increase in the federal funds rate in March.

What would it take to reverse that judgment? To raise rates and still be confident in progress toward our inflation objective, we would need to see those forces abate at least somewhat and evidence that inflation is moving back toward our goal, along with some firming of expectations. I would want to see a constellation of data indicating progress on actual and expected inflation, some combination of an inflection on the exchange rate and oil prices that's durable, a firming in core inflation, and an improvement on market-based measures of inflation expectations. In view of the current balance of risks, to act without hard evidence that inflation is moving toward our goal threatens to undermine the credibility of our inflation target.

My views on policy are importantly shaped by the very limited room we have to cushion shocks on the downside using conventional tools. In contrast, if we were to see an unexpected acceleration in inflation, we have ample room and experience using conventional tools to adjust policy in a manner that is not disruptive. Interestingly, other advanced-economy central banks have taken note of recent developments and suggested they may warrant adjustments in their path of policy.

In our discussions yesterday and today, I heard around the table a strong sense that recent developments pose downside risks to the outlook for inflation and activity. If this is, in fact, a widely held view among those on the Committee, I think it would be helpful to shape market expectations that the path of policy is sensitive to recent negative developments. I recognize there are risks to reacting both too much and too little, but I believe we can strike the appropriate balance, signaling we are actively engaged and prepared to adjust the path of the policy rate in tune with financial and economic conditions without appearing to lurch or suggesting greater alarm than is warranted. If we do not do so, we risk seeing further financial tightening due to expectations of divergence and further deterioration in inflation expectations.

I can support alternative B. I would find it difficult to support language that continued to describe the risks to activity and inflation as balanced. Thank you, Madam Chair.

CHAIR YELLEN. Thank you very much. President Evans.

MR. EVANS. Thank you, Madam Chair. I support alternative B. Yesterday Governor Fischer stated some interesting financial-stability concerns related to equity market pricing and changes in the federal funds rate. Because I favor continued strong accommodation, I want to clarify my views on those particular concerns.

After the Lehman Brothers crisis, the financial crisis, and the deep recession that followed, a big output gap emerged, \$11 trillion of net worth was destroyed, and risk aversion increased very strongly. In that context, monetary policy accommodation was required to facilitate as quick a return to trend economic growth and a closing of the output gap as necessary. I viewed that as a fundamental improvement that supported equity prices throughout that time and a reduction in risk aversion. I view so much of that period as a fundamental improvement that supported equity prices. As we get closer to closing the gap, then renormalization, I think, properly gets that back. Anyway, that's my view regarding why policy accommodation continues to be appropriate, even in the presence of those concerns.

We made it clear in December that future policy would be data dependent. To me, data dependence reflects not just the baseline outlook relative to our dual-mandate goals, but also the uncertainties and balance of risks surrounding that outlook. As I noted yesterday, while I've not changed my baseline much, the developments since our December meeting have raised uncertainties and shaded the risks further to the downside. In addition, financial conditions appear to have already tightened in response to the increase in uncertainty and risks. So, for me, data dependence and appropriate risk management dictate that we do not raise rates today, and

that we communicate this reasoning for the decision to the public. Alternative B accomplishes this. Before we move again, we should be confident that economic growth and inflation have successfully weathered the latest round of downside shocks. It could be well into the second half of the year before I have that confidence. I think we need confirmation that our above-trend outlook for economic growth is still on track to drive continued labor market improvement. That is an important channel for many of our inflation projections to rise to trend. My December SEP submission envisioned only two quarter-point rate increases in 2016. For me, this slow pace of renormalization—or even less—still seems appropriate.

I support the new last sentence in paragraph 2. We need to carefully assess the balance of risks. In this environment, risk-management arguments weigh more strongly for further delay.

Let me quickly repeat my risk-management views. It's a new year, and we have new Committee members. I'll be very brief, and they're very similar to what Governor Brainard and others have mentioned. We continue to be in a special policy environment because of the lower bound. Our move of 25 basis points in December doesn't give us enough headroom to use conventional policy to address any meaningful downside shock to economic growth or inflation, but we still can easily raise rates to address upside surprises. Accordingly, even if the baseline outlook does not change, increases in uncertainty and downside risks generate asymmetric expected policy losses, and risk-management considerations still tell us that this asymmetry should be addressed with accommodative and perhaps looser monetary policy.

Finally, I'll note that, in paragraph 1, when we're talking about inflation expectation measures, we still, for survey-based measures of longer-term inflation expectations, simply say that they're little changed on balance. In your own comments, Madam Chair, you mentioned

that they're at near-historic lows for the Michigan survey. It would be useful, perhaps, to add that, although challenging. Thank you, Madam Chair.

CHAIR YELLEN. Well, last time, we did say they had edged down, and I think, in reflection of that, we agree they're low.

MR. EVANS. Thank you.

CHAIR YELLEN. President Bullard.

MR. BULLARD. Thank you, Madam Chair. I support alternative B for today as written. Real GDP growth for the second half of 2015 appears to have been substantially weaker than I anticipated earlier in 2015. I do react to the data. I am concerned about this, and I would hope to see a rebound in the first half of 2016. For now, I'm willing to go with the staff view that the U.S. outlook has not changed materially. However, this bears careful watching in the coming weeks. Labor markets have been strong, but there will now be even more pressure on this aspect of the economic data. Weak jobs reports at this point may change the narrative substantially and perhaps suddenly for the U.S. economy.

I have a few comments on the equity selloff. By itself, I'm not particularly concerned about it. I can summarize President Kaplan's remarks from yesterday that valuations could be viewed as returning to more normal levels, historically speaking, and this would be a welcome development for the U.S. economy. We don't know if this will intensify, as Vice Chairman Dudley was talking about. Despite all of that, I would still be concerned that markets are reacting to a deteriorating U.S. outlook that we are dismissing at this point because of strong labor market outcomes.

I have a few comments on declines in crude oil. Ultimately, I still view this as a positive for the U.S. economy. Again, I don't think many would be willing to say that a sharp rise in

crude oil prices would be a positive for the U.S. economy. So it's got to be that declines are the positive for the U.S. economy. I do think, though, that the decline in crude oil prices continues to have disconcerting effects on inflation expectations. This also bears careful watching, and it's an important acknowledgment in the statement that market-based inflation expectations have been declining. I share some of the concerns of President Evans. These are at 10-year lows. That's pretty low. Actual year-over-year Dallas Federal Reserve trimmed mean inflation remains stable at about 1.7 percent. I take comfort in that, but I'm worried that this will not last if inflation expectations continue to decline.

My last comment is on the effects on policy of the current global financial developments. We made a small rate move at the December meeting. Even with that rate move, policy remains accommodative, and we say so in our statement. This is normalization, not tightening. Did markets interpret this as a much larger move? I think that's a key concern for the Committee. If it was a 25 basis point move by itself that was truly data dependent, you wouldn't have expected major effects. Markets may have interpreted this as a much larger move, however. Why would this be? It would be because, while we emphasize data dependence, the amount of credibility we have on this issue is limited because of the legacy of the 2004–06 tightening cycle, in which we were not data dependent. Once we got going in that tightening cycle, we simply increased at a certain pace, which, at that time, was every meeting. We also have the QE tapering legacy, in which we said we were data dependent but we actually tapered in a more or less mechanical fashion and did not change the pace of tapering in reaction to economic data.

Now we're coming into this phase in which we're again saying we're data dependent. Markets—or at least some corners of markets—are saying, “No, you're not.” Some corners of financial markets may have viewed the Committee as making a quasi-commitment to four rate

increases in 2016. The nature of financial pricing is that you pull all of that forward and you get a big selloff in markets and other kinds of effects.

This is obviously a very tenuous story, but I would be concerned that we don't have enough credibility in our data dependency, and this echoes a few of the comments that Chair Yellen just made. To the extent that we can build credibility that we are actually willing to react to incoming data, we'll get better policy results. I see our normalization cycle as "When we get good news, we'll make moves. When we don't get good news, we won't make moves." I think the market is saying, "You guys are going to plow ahead no matter what the news is." To the extent that we can draw distinctions between those two options and build credibility on data dependence, we'll get better monetary policy. Thank you very much.

CHAIR YELLEN. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Chair Yellen. I support alternative B with the language as revised. In my communication after this meeting, I intend to emphasize that current monetary policy remains accommodative; that any action we take will be data dependent; that there is no predetermined path—or, as President Lockhart said, we are agnostic on the path, and I like that language—and that we will not be, for lack of a better term, Calvinistic in our actions [laughter]; and that any future removal of accommodation will be done only gradually. I will do everything I can to avoid getting pinned down into predicting the number of moves that we might make in 2016.

I will also, though, emphasize that there are three segments that are distinctive but interrelated: first, U.S. economic developments, which are obviously GDP, unemployment, and inflation; second, non-U.S. economic developments, which have obviously weakened; and, third, global financial market developments, which have clearly tightened. I will emphasize that the

S&P, as I said yesterday, is not the same as the U.S. economy, although it is affected by it. It is also heavily affected by non-U.S. developments and global financial developments. In 2016 or in this part of it, we will have to be patient, and I will talk about that in assessing the ramifications on underlying U.S. economic conditions of the weakness we are seeing so far in non-U.S. economic activity as well as global financial developments.

While I've said before and I do believe that normalization would be desirable because of the potential distortions that excessive accommodation has on asset allocation, investment, and hiring, I don't believe we can force normalization, and we really do have to be data dependent. The prospect of normalization has caused markets and risky assets to undergo a revaluation. There is now a greater focus on fundamentals and possibly a gradual return to more traditional asset allocation. I actually think both of those developments are not a bad thing if they don't go too far. In that vein, I'm going to be particularly focused in the next few months on S&P earnings forecasts, which, right now, as I mentioned yesterday, are \$115 to \$120. I will feel much better if forecasts stay in that range. I'll obviously be looking at high-yield and investment-grade credit spreads, and I'll be looking at the 10-year Treasury.

In addition, I'll be continuing to try to assess the effect of three key secular, apart from cyclical, trends. The first one is aging demographics in the United States, China, Japan, and Europe, which negatively affect labor participation rates and are expected to have further negative effects on those participation rates in the future, reduce potential GDP, and have a negative effect on r^* . The second secular trend is China, where there's overcapacity and a transition to a more service-based economy is likely to take many years. The world is going to have to get used to slower rates of Chinese economic growth, and this is going to happen over a very long period. The third secular trend I'm focused on and am trying to continue to understand

and assess is the end of the so-called debt supercycle. That is, it is tougher for countries, including the United States, to boost their economic growth in the future by using leverage. I think the prospect of removal of central bank accommodation even gradually will likely create greater focus on these secular trends. Thank you.

CHAIR YELLEN. Thank you very much. President Mester.

MS. MESTER. Thank you, Madam Chair. I support making no change in the federal funds rate at this meeting, as in alternative B. In my view, the most likely outcome continues to be that the economy will evolve in a way that warrants a gradually rising path of policy rates over time, although there are risks associated with that outlook. I view alternative B as consistent with my view on the economy, and I think that policy remains pretty well calibrated to the economic outlook. In my view, I don't think we have accumulated enough evidence to conclude that the medium-run outlook or the risks associated with the outlook have changed in a material way that necessitates giving a signal about a change in our policy course.

The proposed change to the description of our inflation outlook acknowledges the further decline in oil prices and that inflation will remain low in the near term but, at the same time, indicates that, over time, inflation is expected to move back once the effects of energy price declines dissipate. As I discussed yesterday, if energy prices continue to fall, we'll need to reconsider that language, but today I'm comfortable with the proposed language in alternative B.

Given the intermeeting developments in financial markets, I do think it's appropriate to indicate we're monitoring economic and financial developments closely and assessing their implications for the medium-run outlook. This is consistent with past communications that our monetary policy decisions are going to be data dependent.

Regarding the balance of risks, I note that in September, in a similar period of high market volatility, we did not change the balance of risks but indicated we were monitoring developments abroad. I see today's situation as somewhat analogous and would have preferred we not change our balance-of-risks assessment, because of the potential that that change might alter expectations further about our March decision. And I would like us to remain data dependent with respect to our decision at that meeting, in which we'll have new projections, and at subsequent meetings. Now, it is true that we're monitoring developments and assessing their implications for the outlook and the balance of risks associated with the outlook. My concern is not with the truth of the statement but with the signal that would send about our policy rate path for the period ahead. That said, I'm prepared to accept that statement as written in the revision of alternative B.

Finally, I do understand it's important to show that the Committee is aware and cognizant of economic and financial market developments, and I understand that we need to signal that in the statement. But at times like this, when we've seen a lot of volatility in the markets, it's easy to signal that we're focused on the short run. Of course, as the people around the table have said, in view of the lags with which policy affects the economy, we need to be thinking about the medium-run outlook. And I don't think we should use our statements to encourage short-run thinking. Again, that said, I'm supportive of alternative B and the revision that was made. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Lacker.

MR. LACKER. Thank you, Madam Chair. I won't attempt a comprehensive review. I'll just make a couple of observations. First, I've heard a lot of discussion about downside risks. Obviously, it's the topic of the day here. But I'm also struck that it's very unclear whether

global developments are going to affect our economic growth prospects materially. When financial markets move significantly, like they have, without an immediately discernible deterioration in economic fundamentals, we often find ourselves striving to write a statement that shows we're paying attention without adding to market pessimism unduly. I think the new language proposed for the end of paragraph 2 strikes as reasonable a balance as possible.

Now, of those two concerns you commented on, Madam Chair, the risk of distorting or biasing market participants' outlook is, for me, more pressing. People take our assessments of economic conditions very seriously, I think. They accord a lot of skill and ability to us in our capacity to sift through the data and make a judgment about economic prospects. And I think there have been times in the recent past when our actions and statements have had an influence on broad market beliefs about economic prospects. So at times like this, we should be really cautious about altering our assessment of the economic outlook as well as the policy outlook.

I'd also point out that this phrase "balance of risks" has been used commonly in our discussions yesterday and today in the sense of where outcomes are likely to fall in terms of economic growth and inflation. The origin of that language in our statement is as an explicit signal of the likelihood of the direction of the next move. So while you might be attracted to one formulation under one interpretation of "balance of risks," I think we should be cautious because it has this broader connotation of putting down a marker about which direction the next likely move is going to be.

I want to comment on one other aspect of the language. This might be odd to bring up here, considering the tenor of things. But I would point out that, in paragraph 1, we say that "a range of . . . labor market indicators . . . points to some additional decline in underutilization of labor resources." We should think about that going forward if things play out the way the

Tealbook suggests. I argued yesterday that underutilization is statistically indistinguishable from zero now, and I think that word is going to be increasingly problematic as we go forward.

Paragraph 1 of alternative C contains what I believe to be more appropriate language. There, it says that a range of labor market indicators “points to some additional increase in utilization of labor resources,” without judging what “full” or “underutilization” is. That concludes my comments, Madam Chair.

CHAIR YELLEN. Thank you very much. President George.

MS. GEORGE. Thank you, Madam Chair. I support alternative B as an appropriate pause after the first rate hike in several years. Although volatility in financial markets has already made the path of the funds rate less certain this year than in December, I continue to anticipate moderate economic growth and rising inflation, with further removal of accommodation this year being appropriate.

My confidence in that forecast, however, will depend on judging between now and March the signal of various risks and uncertainties that have been well highlighted at this meeting. In light of that background, I support the revised language in paragraph 2. It is what I consider to be an honest assessment on the part of the Committee about the risks. I would also add that I had a similar comment to President Lacker’s as it relates to how we characterize additional declines in underutilization, versus increases in utilization as described in alternative C. I hope we’ll consider that as we go forward.

CHAIR YELLEN. Thank you very much. Governor Powell.

MR. POWELL. Thank you, Madam Chair. I support alternative B. Both the weaker inflation picture and the likely increase to downside risks suggest to me that the Committee can and should proceed cautiously. As I mentioned yesterday, there are several story lines

underlying the recent market weakness, and I think that the Committee will need some time to understand whether markets have overreacted.

As for the language, I support the revised language in the statement. The Committee, in my view, has to navigate between two risks. Saying that “risks remain balanced” no longer seems right to me, and I think it also risks suggesting that the Committee is committed to a preset path. At the same time, it seems premature to me to say that they are skewed to the downside; I also think that could send too much of a signal. So I think that the proposed language navigates between these two risks and suggests that the Committee takes note of potential downside risks, is watching developments carefully, and will react appropriately. Thank you, Madam Chair.

CHAIR YELLEN. Thank you very much. President Kashkari.

MR. KASHKARI. Thank you, Madam Chair. I agree that, as the Chair noted, it’s important to show that we recognize downside risks but do so without appearing to panic or sending a negative signal that could further increase volatility. I think alternative B strikes that balance appropriately, so I support alternative B.

As we’ve talked about, there are risks to any outlook, and we have to be prepared to respond if the economy evolves in ways we may not expect. Like others, I am particularly concerned about downside risks here. I’ve been thinking about what we’re seeing in the markets, and it’s hard to tell signal from noise. One piece of data that has stuck with me, as I read in the Tealbook, is that we estimate the Chinese have spent about \$400 billion defending their currency. That struck me as pretty revealing that they must be concerned. So while we don’t have great visibility into what’s happening in China, we do now, I believe, know that they are legitimately concerned.

I think alternative B is the right approach, and I'm concerned about what actions we would consider taking if these financial market developments actually did affect our economy. As others have noted, if things are better than we expect, we have a lot more room to react, and we've got plenty of levers. If things are worse than expected, what would we do? I'd be very interested in the staff's analysis of what some of those options could be if these things evolve in ways that we hope they don't. Thank you.

CHAIR YELLEN. Thank you very much. Governor Tarullo.

MR. TARULLO. Thank you, Madam Chair. Yesterday I said that my baseline expectations, while less optimistic than those of the Committee as a whole, hadn't changed too much since December, but that I thought the risks had moved from modestly to decidedly weighted to the downside. The remarks that a couple of you made yesterday afternoon suggested, I think, the valid point that the weight of the downside risks may itself have affected baseline expectations. I think I actually heard all but a few participants take one or both of those perspectives, and the second seems to me an interesting one. But, to me, the more important point was that all but a few people did seem to regard risks as having shifted to the downside. And there, just to be clear, I agree with Jeff that that doesn't mean it should be a signal of what the next interest rate move is, but that it's an honest appraisal of where the economy stands right now.

I said in December that I didn't have reasonable confidence that inflation would rise to 2 percent. Nothing since then has increased my confidence. To the contrary, a few more doubts have crept in. Looking at the Committee's median expectation—this in the December SEP—of a 1.6 percent increase in both headline and core inflation, I think it's important, as I said yesterday, to make as close a real-time evaluation as possible of the degree to which actual

inflation is tracking those expectations. We've already seen in this Tealbook that the path expected in December has been pushed out a couple of quarters. It remains to be seen whether the slope of the path itself will hold after those couple of quarters. The staff's monitoring mechanism, as explained yesterday by David Wilcox, will help answer this question. This will be in line with my recurring call for some evidence that expectations derived from models or past correlations are actually being realized before we take policy steps based on them.

As to the statement, alternative A captures my views better than alternative B, certainly, in paragraphs 1, 2, and 3, though I must confess that the subtlety of the difference in the last sentence of paragraph 3 somewhat eludes me. So I may be missing something. Indeed, I think the views of the Committee as expressed yesterday suggest support for at least the weak version of the last sentence of paragraph 2 of alt-A with respect to downside risks, but I hear many participants reluctant to articulate what, as someone said, is a true statement, because of the tactical reasons of what kind of signaling that may indicate about where we are going.

Personally, like Lael, I'd be quite surprised if it was appropriate in March to increase rates further, but one never knows. As the policy actions in alt-A and alt-B are, I think, identical—in fact, I know the policy actions are identical, but I just don't understand that difference in phraseology in paragraph 3—I can certainly go along with alt-B, including the more agnostic version of the last sentence of paragraph 2. But I must confess that I do so a little bit reluctantly on the basis of past experience where, just to be direct about it, some participants take agnostic language and then try to go out and shape expectations of how many rate increases that's going to indicate over the next year. I hope, as President Kaplan urged, we don't do that going forward.

I wanted to end with a point that I've made before, but I wanted to make it again. On the concept of normalization, I resist the notion that whatever we're engaged in is a normalization process, because that suggests there is a "normal" for monetary policy. It's not a matter of getting the body temperature back to 98.6. What is appropriate policy is going to depend on what the circumstances are that we face. And, while some regarded having zero interest rates as abnormal, suggesting that we needed to get off of it as soon as possible, I think we see in the results that it was entirely appropriate, in view of external conditions, to be at zero. I would also say that the very good r^* discussion we had a few meetings ago should have reinforced the idea that, at some level, we don't really know quite what "normal" is, and that "normal" changes over time. So that doesn't affect how one thinks about actual rate increases, but I think it does, in public communications, sometimes affect people because it suggests that there is this obvious goal. We may say we're data dependent, but we're going to get to that goal. We're going to normalize, meaning "get back to the normal level." Maybe a few of us actually believe that, but I don't think most of us, including some who use that term, actually mean that. I think they really are making judgments as to what's appropriate in what circumstances. Thank you, Madam Chair.

CHAIR YELLEN. Thank you.

MR. FISCHER. May I say something?

CHAIR YELLEN. Yes. Governor Fischer.

MR. FISCHER. Well, I understand what you say, Governor Tarullo, but I will continue to use the word "normalization." I don't think a zero interest rate is a normal situation. It hasn't been historically, and I'd rather be in a situation in which you can move both ways as needed. Of course, that is not to say that zero was wrong when we were at zero. And, if I may

continue—President Evans, I didn't say anything critical of QE or policies followed up to 2015 or 2016. I was just trying to explain why, as we come out of zero, we might expect stock prices to adjust because the capitalization factor is rising. That's all I was saying.

MR. EVANS. Thank you.

CHAIR YELLEN. President Bullard.

MR. BULLARD. On Governor Tarullo's comments on normalization, I'd be willing to use a different word if you wanted to. But "tightening," I think, is contrary to some of the things that we're saying, because we're saying that policy remains accommodative. And if you say, "Well, every time you raise rates, you're tightening," I'm not sure that the Committee is really there. Even taking into account the r^* discussion, I think we still believe we've got an accommodative policy. I struggled a little bit to describe the situation, but I thought "normalization" was maybe a good term. I'd be happy to switch to something else, but I think the idea was to not be saying that we're tightening in a situation in which people think the economy is certainly not at the level that it's been historically.

MR. TARULLO. Well, I wasn't trying to suggest any particular formulation, Jim. One could say "removal of accommodation" or whatever. I actually, though, think Governor Fischer made my point, even though he was rebutting it [laughter], that zero was appropriate for those conditions, and what will be appropriate in the future will depend on what the conditions are, both cyclical and secular. That's really the only point that I was trying to make, and, as I say, I know you, certainly—and, I suspect, others—have not had in mind that there's some interest rate that we're going to end at. You're taking the data and your assessment of the economy as we go. But I have read more than one account in which people have said, "They're normalizing to get to

a particular rate,” and the rate is the one that they find in the SEP. And we just don’t know that yet. Now, that’s really my only point.

MR. EVANS. Madam Chair, could I say something?

CHAIR YELLEN. President Evans.

MR. EVANS. I’m confused by this. I thought we had work streams that use the term “renormalization process.”

CHAIR YELLEN. We do.

MR. TARULLO. It’s not my work. [Laughter]

MR. EVANS. Well, okay. But as a Committee, I’ve seen documents in which we refer to this as renormalization, and there have been periods when Chairman Bernanke certainly had strong preferences for certain types of terminology as opposed to others. I just assumed that, on most occasions, it would be okay to use the official language. I don’t think I disagree with the substance of what you’re saying, though. I agree with you that we have to be clear about it. We all have our viewpoints of where we’re headed.

CHAIR YELLEN. President Williams.

MR. WILLIAMS. Am I next?

CHAIR YELLEN. You are.

MR. WILLIAMS. Number 15. All right. Thank you, Madam Chair. First of all, I want to correct something in my response to Governor Tarullo’s question to me at the end of my remarks during the economic go-round, when I was talking about the composition effects. He asked me if these papers are available. They’ve actually been available for years on our website.

MR. TARULLO. These are the same papers?

MR. WILLIAMS. These are the same papers. I said I wasn't sure whether they were. They are. What is new is the update through the current, most recent data, which we'll be happy to share. But it's the same analysis—one paper by John Fernald, Mary Daly, and Bart Hobijn and the other paper by Bart and Mary. So these are analyses they've done in previous work. We've been updating it regularly.

I support alternative B. I think it does a reasonably good job of paying heed to recent developments while indicating that the medium-term trajectory of the economy remains favorable. In this regard, the modal outlook hasn't changed much since the December meeting despite the spike in financial market volatility. The incoming data on economic activity have been mixed, with a fourth-quarter dip in output growth but the stronger-than-expected job gains. Like the Tealbook, I take more signal from the employment data. So I continue to expect somewhat slightly above-trend GDP growth and employment growth this year, and that's sufficient for us to overshoot full employment by a meaningful amount. Headline inflation data continue to be low, but that's mainly stemming from another round of transitory restraining factors. These, too, shall pass. And, as the labor market tightens further, we should get back on track toward our 2 percent inflation objective.

Now, in thinking about the future path of policy, I do find it instructive to look at Tealbook B in terms of how the changes in the outlook regarding output, employment, and inflation affect what the path for policy should be. Whether you're looking at policy rules or the optimal control simulations, these are ways of thinking about policy that have been studied for decades, and they've been highlighted by the Chair in numerous speeches. And if you look at the very modest changes in the modal forecast—I'll get to the risks in a moment—basically, that implies the changes in the projected paths for real activity and for inflation that take into account

all of the factors that everyone talked about the past few days: a stronger dollar, the weaker stock market, weaker economic growth abroad, and the weak Q4 data. Everything that we talk about in the modal forecast is in the Tealbook. I trust that the staff has incorporated all of the latest information to get their view of where the economy is and where it's going, and it basically calls for just a slightly shallower path for the funds rate—maybe a $\frac{1}{4}$ percentage point lower path in the funds rate over the next year or so. And that's appropriate, in light of the effects of, especially, the stronger dollar and financial conditions on where the economy is and where it's going.

Now, the good news there—and here I am a little perplexed by some of the comments by both the Chair and President Bullard about how the market is locked into thinking we're raising it four times this year. Well, with these weaker data and with the changes in conditions, we've seen a significant movement in expectations for the funds rate for 2016. According to the Tealbook, the primary dealer survey says that, already, even after just a few weeks, they expect one fewer rate increase in 2016. If you look at the probabilities in Simon and Lorie's presentation, for a second rate hike by March, at the beginning of the year, it was around 50 percent. According to the latest data that Simon shared with me, we're under 30 percent today. So the market expectations are moving, as they should, with a data-dependent policy approach that we have announced and we should stick to. My own personal view is similar, based on this analysis—that we should have probably one fewer rate hike this year already on the basis of the changes in the data. So I don't see there being this clear problem that market expectations see us somehow set on a course of having four rate increases. I think the data strongly contradict that sense out there.

We have to continue to be data dependent. We have to watch what's happening. I agree with the point that Governor Tarullo and, I think, Governor Brainard made about watching the inflation data: not just hoping—hope is not our strategy—but also making sure it's consistent with the outlook. And I really like David Wilcox's approach of showing us how the data have been coming in relative to our expectations. I agree with all of those points. I would say that right now, the change in the baseline forecast has actually been quite modest, and I think that calls for a relatively modest modification of our path for policy.

That brings me to the risks, and here I actually come out with comments very similar to those of Presidents Mester and Lacker. I agree with the Chair completely about trying to thread a needle here. We're trying to neither scare markets by saying that the risks are mostly to the downside nor look asleep at the wheel. This has been a situation that we've been in before, as Presidents Lacker and Mester mentioned. It doesn't work as well as we think. When I try to thread a needle, with my vision deteriorating, I find that I put the thread next to the needle about 50 times in a row. I think this is what's going to happen when we try to do this. There will be a market interpretation that the FOMC is, with the new language, putting significant weight on or making an acknowledgment that risks to the economic outlook are worse. That may be what the Committee wants to do. I think that's just a reality. I do know from September that the commentary I heard from members of the public in my outreach activities was shockingly or surprisingly strong and consistent, indicating that, clearly, the FOMC knew something that the rest of the world didn't know, and that we were much more worried about global economic and financial developments, which was worrisome to people.

I know we've considered all of those issues. We had a good discussion. Again, I can support alternative B. My expectation is, when the statement goes out, this will be seen as, in a

way, validating the worries out there in the market. It could make expectations a little bit worse and will definitely lower market perceptions of the probability of a rate hike in March. But, again, it's a difficult decision to make, and I do support alternative B.

In terms of future language, we were asked for our views on alt-A and alt-C for the future. My view is that alt-C, whenever we do think it's appropriate to raise rates, is a fine starting point. So I did answer their question on that. Thanks.

CHAIR YELLEN. Thank you very much. Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you, Madam Chair. I support alternative B as written. I do think we face a tricky communications problem at this meeting. As I see it, we have four objectives. First, we want to keep our options open in terms of what we do at the March meeting. Second, we want to acknowledge the ongoing international financial market developments because they are noteworthy and do, if sustained, have significant implications for the economic outlook and monetary policy. Third, we don't want to show so much concern about the outlook that we exacerbate market participants' fears about the global outlook, making the bad outcome more likely. Language that showed great anxiety on our part might make households and businesses more skittish. Fourth, we don't want to create an impression that monetary policy will necessarily respond to short-term movements in financial asset prices. In other words, there's no "Fed put." At the same time, financial conditions do matter because they do affect the outlook for economic growth and inflation.

My own view is that the risks to the outlook may have tilted slightly to the downside, but I think you can make the case that it is premature to reach that conclusion. We just don't know whether the tightening of financial market conditions will be sustained and what the effect will be on the economy's performance. To me, the alternative B formulation says that we're mulling

it over and we haven't reached a firm conclusion yet. March is still open as to whether we will or won't raise the federal funds rate target. It depends on the data, broadly defined. And when I say "broadly defined," I mean that it includes global and financial market developments. So I think alternative B strikes the right balance.

That said, I think the March meeting is going to be very consequential. If we do tighten, it will tend to crystalize the idea that we're doing four rate hikes this year, and it may contradict our saying we're data dependent. People may start to say, "Oh, they're on a mechanical path of every quarter." Sitting here, not knowing where we're going to be in March, I guess my inclination is that the bar to tightening in March is a little high. I need to see a positive reason to tighten in March, as opposed to a strong reason not to tighten in March. So the bar there is a little higher than it was before, because it will be quite consequential in terms of how markets would react to a March tightening. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Well, I think we've had a good round of discussion.

MR. LAUBACH. Madam Chair.

CHAIR YELLEN. Yes, Thomas.

MR. LAUBACH. Excuse me. President George brought to my attention that, unfortunately, there is a tiny typo in alternative B. In particular, in paragraph 2, the second line, if you'll squint, you'll see that the "s" in the word "adjustments" is struck. I believe that is not intended. So it should stay plural—"with gradual adjustments," as opposed to "with gradual adjustment." I apologize for that mistake.

CHAIR YELLEN. Okay. I hope, without objection, we can accept that change.

MR. TARULLO. Clearly, President George doesn't have President Williams's eye problems. [Laughter]

CHAIR YELLEN. Keen eye. Thank you for catching that.

I think we've had a very good discussion, and all of us recognize that threading that needle today is difficult. The outside commentary, I think, indicates they think we have a hard problem, and, although there are some qualms about the language in alternative B, I think I've heard broad-based support around the table for alternative B as written. So I would like to ask Brian to get us ready for the vote.

MR. MADIGAN. Okay. This vote will be on the statement for alternative B that appears on pages 6 and 7 of Thomas's briefing materials, with the correction of the typo that was just noted. It will also be on the directive to the Desk as it appears in the implementation note on pages 10 and 11 of those briefing materials.

Chair Yellen	Yes
Vice Chairman Dudley	Yes
Governor Brainard	Yes
President Bullard	Yes
Governor Fischer	Yes
President George	Yes
President Mester	Yes
Governor Powell	Yes
President Rosengren	Yes
Governor Tarullo	Yes

CHAIR YELLEN. Very good. And I would note that, unlike at our December meeting, there's no need for the Board to vote on actions pertaining to interest on excess reserves or the discount rate, as we're leaving those unchanged.

Let's see. I think at this point, we're going to have a further discussion on fan charts. But I think we could take a break for coffee for 20 minutes and reward ourselves for all that we have accomplished. [Laughter]

[Coffee break]

CHAIR YELLEN. Okay. Thanks, everybody. There's one last item on the agenda, and that pertains to the possibility of adding fan charts to the Summary of Economic Projections.

Let me start off by again thanking the subcommittee on communications and the staff who worked with the subcommittee. We have had a number of discussions over the years about fan charts, and I'm pleased that the subcommittee has put forward what I think is a sensible proposal for moving forward. Let me turn it over to Stan to begin our discussion.

MR. FISCHER. Thank you, Madam Chair. The subcommittee on communications indicated last summer that we'd come back to this Committee with a proposal for the use of fan charts in the SEP after doing some work with the staff on possible approaches to the construction of the fan charts. We've examined a number of options, and our memo to the Committee on January 11 provided a specific proposal for simple fan charts. We do not claim that these fan charts are a critical advance, but we do think they offer a real improvement in our communications. Todd Clark from Cleveland is going to provide the specifics of the proposal, but, before that, let me make a couple of points.

First, in past Committee discussions of fan charts, there's been a fair amount of support for the idea that they would be a useful addition to our communications. They'd help to communicate that our projections are subject to considerable uncertainty and so help make it clear that policy will depend on incoming data and their implications for the economic outlook. In addition, a comparison of the fan charts with the existing SEP chart showing the range of participants' projections will help make it clear to the public that the differences in view across participants regarding the economic outlook are not that large relative to the uncertainty regarding the projections—information that should avoid the sense, which may arise from time to time, that Committee participants are in sharp disagreement.

Second, in past discussions, a fair number of you have indicated either that you are not confident that the fan charts will be understood by the public or that you would prefer more sophisticated fan charts that could convey a more complex message to the public. Well, these two sets of concerns point in opposite directions, of course, and our proposal is a compromise—that is to say, the more complicated it is, the less likely it is to be understood by the public, and you have to get somewhere on that spectrum.

For those of you who are concerned that fan charts will not be well understood, we've aimed to keep the fan charts simple and based them on information that is, for the most part, already included in the SEP and so more likely to be comprehensible to the public. I'd note that a table in the staff memos that you received showed that many advanced-economy central banks use fan charts, suggesting by revealed preference that they view them as a useful communication tool, which is something my conversations with foreign central bankers have confirmed.

For those of you who'd like a more sophisticated approach, I'd urge you to take this first step. At least for now, let's keep the fan charts simple so that we're confident that we can successfully explain them to the public. Simple fan charts like those we've proposed are also low cost, which improves the cost-benefit calculation. Among those costs is how much work the person looking at them has to do to understand them. And, like all parts of our communications apparatus, they can be enhanced over time. Indeed, the experience of the Bank of England, which has produced increasingly sophisticated fan charts, shows how such an incremental approach can work to deliver more informative fan charts over time. In short, we should not let the best be the enemy of the good—our motto for the day. [Laughter]

Let me summarize by saying I was aware yesterday that I thanked the members of the subcommittee for all of the work they had done. I also need to thank the staff associated with the

subcommittee—which includes Todd, Bill English, Glenn Rudebusch, Stacey Tevlin, Ellen Meade, and probably others I’ve omitted—for the hard work they have done with regard to both the consensus statement and this work on fan charts. Todd, would you please take over and provide the details? Thank you.

MR. CLARK.⁹ Thank you, Governor Fischer. I’ll be referring to the handout titled “Material for Briefing on Proposal for Fan Charts in the Summary of Economic Projections.”

In broad terms, the addition of fan charts to the SEP would offer several benefits. First, compared with the SEP’s current table 2, fan charts would more prominently—and therefore more effectively—communicate the broad magnitude of the uncertainty associated with participants’ projections. Second, fan charts would clearly communicate that the differences in the forecasts of participants are modest compared with the uncertainty surrounding the outlook. Finally, a fan chart for the federal funds rate would help market participants understand that the SEP numbers for the funds rate in no way reflect a commitment to a particular path, and that the actual path of appropriate policy will depend on economic developments.

In light of these potential benefits, the staff has worked with the subcommittee on communications to examine a range of approaches to including fan charts in the SEP. On the basis of this examination and in consultation with the Chair, the subcommittee recommends that the Committee adopt, as Governor Fischer described, a relatively simple approach, one similar to those employed by a number of foreign central banks. I’ll first review the proposal and then describe some of the alternative approaches that the subcommittee has considered.

The proposed charts, provided in exhibit 1 of the handout, show median SEP forecasts surrounded by symmetric confidence intervals based on the historical root mean squared errors of private- and public-sector forecasts. The underlying root mean squared errors used to construct this chart are taken from the SEP’s current table 2, extended to include the federal funds rate. The fan charts deliberately show only 70 percent confidence bands, which suffice to communicate the uncertainty associated with the SEP. Although the root mean squared errors could be used to form and report 90 percent confidence bands, the historical forecast errors provide relatively few observations of tail occurrences, and the normality of the forecast errors that’s required under a root-mean-squared-error-based approach could be an approximation that’s much less accurate with a 90 percent confidence interval than with a 70 percent interval.

This proposed approach offers simplicity along several dimensions: The charts would be straightforward to construct from information already available and, for the

⁹ The materials used by Mr. Clark are appended to this transcript (appendix 9).

most part, already used in the SEP; they would not require any additional information from FOMC participants; and they should be relatively easy to explain.

That said, the root-mean-squared-error-based approach raises several issues of implementation. These issues were all discussed in the staff memo distributed to the Committee on January 11, but, in the interest of brevity, I'll focus on two of them today. First, the two components of the fan charts—median projections from the SEP and confidence intervals based on root mean squared errors from past forecasts—are conceptually different. The SEP numbers reflect each participant's assessment of appropriate policy, not the modal path of policy as in the case of some of the forecasts that are used to calculate the root mean squared errors. All of that said, the SEP medians are, in most circumstances, generally close to most participants' expectations for the economy and the path of policy, and therefore the root mean squared errors underlying table 2 and the fan charts, while not strictly comparable, should provide a reasonable, approximate measure of the uncertainty associated with the median projections.

A second implementation issue is that, in past discussions of fan charts, some Committee participants have expressed misgivings about providing a fan chart for the federal funds rate. A funds rate fan chart could blur the distinction between views regarding appropriate policy and modal projections of the funds rate. Not providing a fan chart for the funds rate could help maintain that distinction. On the other hand, omitting a funds rate fan chart might increase the risk that some members of the public mistakenly view the projected path of the funds rate as a commitment. For this reason, other participants have at times suggested that a fan chart for the funds rate would be particularly useful because it would help communicate that the appropriate policy rate path is quite uncertain and dependent on economic developments. In the subcommittee's assessment of the merits of a fan chart covering the funds rate, these advantages are viewed as outweighing the concerns.

As part of the analysis that led to this recommendation of the simple approach that I've outlined, the subcommittee considered several other possible approaches to constructing the fan charts. I'll briefly describe these possible approaches, their potential advantages, and the subcommittee's reasons for judging these approaches to be less desirable than the proposed approach, at least for now.

Under the first alternative, confidence intervals surrounding the SEP medians could be constructed using the actual historical distributions of forecast errors—and by that I mean the percentiles of the forecast errors—instead of root mean squared errors. This alternative approach would not require the assumptions of symmetry or normality that implicitly underlie the root-mean-squared-error-based approach. Confidence intervals based on the historical distributions of forecast errors could also be useful for capturing possible asymmetries in the forecast errors for the unemployment rate and the federal funds rate. But fan charts based on the historical distributions of errors could be somewhat more difficult to explain to the public than fan charts based on just root mean squared errors. And, perhaps more important, the

available data for quantifying the asymmetries from historical forecast errors may not be enough for the SEP fan charts to reliably represent these relevant asymmetries.

Second, the fan charts could be based on forecast confidence intervals constructed from simulations of an econometric model or models. The model-based approach could be attractive for its structural approach to quantifying forecast uncertainty and for allowing these simulations to capture asymmetries due to the effective lower bound on interest rates. But against these advantages, the model-based approach could be seen as difficult to explain to the public. Perhaps more important, this approach would make the fan charts model dependent, and it would require agreement on a model or models, including a policy rule or rules. The Committee's past experiments with constructing a consensus forecast suggest participants may find it difficult to agree on a model and policy rule that could be used to construct such fan charts.

Finally, fan charts could be constructed from participants' subjective assessments of the uncertainty and risks associated with their projections. A subjective approach could ensure that the fan charts capture the judgments of uncertainty and risks that contributed to the Committee's policy decision at the meeting. A subjective approach might also allow the confidence intervals to reflect assessments of appropriate policy rather than simply capture past forecast errors.

Notwithstanding these possible advantages, a subjective approach could present a number of difficulties. Most importantly, a number of participants would likely find the reporting requirements to be onerous, and some may be concerned about the reliability of any effort to translate subjective judgments of uncertainty and risks into quantitative measures. Finally, depending on implementation, fan charts based on subjective assessments could be difficult to explain to the public. The subcommittee came to these conclusions in part on the basis of an evaluation of an approach sketched by the staff that involved giving SEP respondents the choice of either submitting their own numerical values for confidence intervals or allowing the staff to quantify confidence intervals implied by the historical root mean squared errors and answers to the existing questions about uncertainty and risks.

Although each of these alternative approaches offers some advantages, after careful consideration, the subcommittee concluded that the relatively simple approach to fan charts based on the SEP medians and historical root mean squared errors was the most effective and would constitute a useful addition to Committee communications. If there was support for this approach, the subcommittee would plan to introduce the fan charts in the March SEP.

That concludes my prepared remarks, and I'd be happy to answer any questions you might have.

CHAIR YELLEN. Thank you, Todd. I'm going to open it up for questions and comments. But before I do so, I'd like to note my own personal view, which is that the addition

of the proposed fan charts to the SEP would serve as a useful enhancement to our communications tools. For example, as you know, the number of increases in the federal funds rate during this year as embodied in the median SEP forecast has received quite a bit of attention of late, and discussions along those lines, I think, tend to reinforce the unhelpful and inaccurate view that we've embarked on a steady path of rate increases with little regard for how the economy will evolve. In that sense, the fan charts would be useful in helping us communicate the uncertainty that's associated with both our economic forecasts and the path for policy. And I wanted to note that if this change is adopted today, I would plan to feature these fan charts in my press conference. With that comment, let me stop there, and the floor is open for questions for Todd. President Lockhart.

MR. LOCKHART. Thank you, Madam Chair. Your comment on press conferences adjusts my question a little bit. We use the word "public," but I can't remember any of my public ever asking me about the SEPs per se. Do we have any "click on" data as to how many people actually read the SEPs and therefore would see these fan charts?

MR. CLARK. Do we track that? I don't know if we track that.

CHAIR YELLEN. I don't know that we track it.

MR. LOCKHART. In some of the Reserve Banks, we track what happens on our website. I'm sure we must be doing something like that here. Do we know how many people actually ever read this stuff?

MR. WILCOX. Of course, one purpose would be to use them at the press conference, so it wouldn't just be through the website.

MR. LOCKHART. Yes, and I acknowledge that.

CHAIR YELLEN. That's why I mentioned it because, as you propose this, we're talking about one additional figure that would be buried deep in the SEP.

MR. CLARK. Right. It would appear in the "Uncertainty and Risks" section. It would be figure 4, following the first figure, which presents the median and the range of views; figure 2, on the funds rate; and figure 3, showing the histogram. Figure 4 would be covered in the section on uncertainty and risks.

CHAIR YELLEN. Right. That's why I thought I would mention that if this change is adopted, we would modify the figure that I distribute at the press conference, which does get a lot of immediate attention. At present, it shows the median, the range, and the central tendency. We would include the fan charts in there.

MR. LOCKHART. I think that's quite relevant. That's pushing information out. This contrasts with just posting it and having someone click on it and read it. But my question preceded your comment, really, in thinking about it. Do we know who the public is for this?

MR. POTTER. Certainly, people in markets look at this incredibly closely. That's one version of the public.

MS. SMITH. And the media.

MR. EVANS. Are you asking whether you can measure whether someone clicks on a figure? Because the SEPs are in the minutes, right?

CHAIR YELLEN. Yes.

MR. EVANS. Well, the minutes get downloaded all of the time. Could you separate SEP views from the minutes generally?

CHAIR YELLEN. Thomas.

MR. LAUBACH. The projection materials are, of course, published at the time of the press conference. So for three weeks, the public will pick up, in particular, the dot plot from that place. That's where you'd find it.

MR. EVANS. I get questions at every speech about the SEPs because I regularly try to inform people about the dot plot, just to share different perspectives.

MR. CLARK. I don't know about downloads, but in some of the public commentary, from the financial press and the economists, there is a tendency to focus on the range of views and confuse that with uncertainty. To the extent that people pay attention to the fan charts, they would help clarify that this is the uncertainty—what you're looking at is the range of views, and, in most cases, the disagreement in views is fairly small in relation to the uncertainty.

MR. LOCKHART. I'll hold the reason why I'm asking until my comments in the go-round.

CHAIR YELLEN. Sure. Are there other questions for Todd before we go to comments? Okay. Then let's go to comments and start with President Mester.

MS. MESTER. Thank you, Madam Chair. First, I want to thank Todd Clark, Bill English, and the rest of the staff supporting the communications subcommittee for their work on this topic. In some sense, the simple approach to fan charts being proposed belies the great deal of effort and analysis that went into coming up with the proposal.

I'm going to tip my hand: I personally see a lot of value in the SEPs, and I think adding the fan charts will be a very useful enhancement. We are somewhat behind other central banks. Most of them publish some type of fan chart. And, in the interest of transparency, I think the FOMC should convey to the public that there's considerable uncertainty associated with our projections, just as it is true that there's considerable uncertainty associated with private-sector

and other central bank forecasts. To me, we're living in uncertain times. It seems like an important omission in the SEP not to include something about the uncertainty in an accessible way. It would help the public avoid confusing dispersion in the SEP forecasts with the uncertainty surrounding the outlook. Sometimes when I go out and talk, I know even I point to dispersion as a proxy for uncertainty, and it's because we have little else to point to in the SEP. But, of course, this is misleading because, as Todd and Governor Fischer pointed out, the dispersion is actually pretty modest compared with the uncertainty associated with the projections. A subtler benefit, which was noted by Governor Fischer, is that, over discussions even in the Committee, one of the criticisms of the SEP in the past has been that it tends to emphasize the differences across participants rather than convey a sense of the consensus view. If we show the relatively wide uncertainty bands, I think it will help put the dispersion into better context.

Since last summer, the subcommittee and the staff have evaluated a number of approaches to fan charts. Some of them were suggested to us by FOMC participants, and these included the subjective approach that Todd mentioned. Going in, I had some sympathy for the subjective approach. But as we worked through it, I became convinced that, at this time, the simple approach would be preferable. We considered a number of different ways of thinking about the subjective approach, which would involve either participants providing their own confidence bands or, for participants who would feel uncomfortable doing that, having the staff map their qualitative assessments of risks and uncertainties that are already in the SEP into confidence bands using historical root mean squared errors. But, in the end, we concluded that this would be somewhat complicated to explain to the public. And if most responses ended up

being based on historical root mean squared errors anyway, then the resulting fan charts would look very similar to the simple ones in the proposal.

Going in—I'm coming clean here—I had some concerns about providing an error band surrounding the funds rate projection, because it would further blur the distinction that the funds rate projection is an assessment of appropriate policy and not a forecast. On the other hand, the fan chart would be a very simple way to convey the message that there's uncertainty associated with the appropriate policy rate path because the outlook is uncertain, and that the policy rate path in the SEP is not a commitment because it's appropriate for policy to respond to shocks that materially change the outlook. So I became convinced that the benefit of providing the confidence band surrounding that funds rate projection was real. I also became convinced that we could handle, with appropriate wording in the exhibit and in the SEP text, the conceptual issue of the SEP reporting the appropriate, not necessarily the expected, policy rate path.

Finally, no feasible approach to fan charts is perfect. I think we have to keep in mind that the goal of this project is to better communicate with the public. Currently, the SEP might be leading the public to underestimate both the degree of uncertainty associated with our projections and the data dependence of our policy rate path. The proposed approach, while imperfect, would alleviate these problems in a way that would be simple to implement and simple to explain. I support the proposal to add these fan charts to our next SEP submission in March, and I hope others on the Committee will, too. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Lockhart.

MR. LOCKHART. Thank you, Madam Chair. I know that a lot of work has preceded this recommendation, so thanks to Todd Clark, Bill English, and others, as well as the subcommittee for your good efforts.

I realize that this is not a highly ambitious proposal. In my mind, it's one to use pictures to make an already made and simple point to an audience that largely already knows it. I recently read the claim that more than half of brain activity is processing the visual, so maybe that's just the reason to go ahead and do this. Nonetheless, I remain a bit of a skeptic of this communication tool, and let me explain why. I don't see how presenting historical error bands derived from both internal and outside forecasts associated with our SEP medians provides useful additional information to our policy communication. The message that there is substantial inherent uncertainty associated with our forecast is already conveyed in the minutes. In a world where every FOMC move is scrutinized for profound meaning, there is some risk that the historical forecast accuracy bands will be construed as reflecting how the Committee is viewing the risks to the outlook as of the SEP publication. And this, of course, isn't the case.

As proposed, the error bands will likely show a nonnegligible chance that the economy will be near or in recession within the time frame of the forecast period. The error bands will always show a significant chance that inflation will persistently deviate from our 2 percent objective. This could be interpreted as weak commitment to achieving our inflation target. If economic growth or inflation was to seem to be on a path that is materially off the median projection path, we know that such a deviation would likely trigger a mitigating policy response.

Now, I acknowledge that many of these concerns about interpretation of the error bands are treated in the proposed appendix. A careful reading of the appendix should clarify what the fan charts say and what they don't say. But I'm not sure we should expect a careful reading of the appendix to inform the less familiar reader of the SEP, and the reader who understands the fan charts at first glance already knows what we're trying to convey. So I'm not sure I see how emphasizing the inherent uncertainty of economic forecasts, which is a very broad assertion,

serves a clear purpose in our communications design. It seems like a lot of effort to dissuade people from attaching any significance to our forecast.

As I said, I know the addition of the fan charts is not intended or expected to be a major communications move, but I'm not sure I see the payoff as greater than the problems that might be caused. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. Governor Brainard.

MS. BRAINARD. Thank you, Madam Chair, and thanks to Todd, Bill, and others for all of the work that went into this. I'm also not enormously supportive of this proposal, although I do have sympathy with the underlying spirit of the proposal, which is to remind the public that any forecast is subject to very large uncertainty bands. But I believe the text that accompanies the SEP already does that.

It's worth noting that people have made a lot of references to other central banks. The other central banks that do present fan charts when they display their forecasts are generally using either consensus forecasts or staff forecasts. They're actual forecasts. The SEP is quite different; it, obviously, is not a forecast. It's a scatterplot of individual member projections. The median isn't comparable to a consensus forecast. I think there is important information content in seeing the range of differences among Committee participants and the median. And most of the people who care deeply about the SEP put a lot of time and resources into understanding the nature of the information that's being provided. By contrast, as I think was said previously, it's not obvious what additional information content superimposing errors from other forecasts provides.

The discomfort is particularly acute with regard to the projected path of the policy rate, due both to the asymmetry associated with the effective lower bound and to the fact that this is a

policy instrument over which the Committee has some control rather than an exogenous economic variable. But I also have concerns even on some of the economic variables. For instance, if I think about inflation right now and I just read some of the text in the most recent SEP surrounding members' views about the distribution of uncertainty, I think it would be skewed to the downside, whereas these bands, as I understand it, would be, by construction, symmetric.

Again, I do see the value of the underlying desire here to remind everybody how much uncertainty there is regarding our projections. Perhaps we should spend a bit of time on subjective probabilities. It does sound like a lot of work, but maybe before going in this direction, we should at least see further work on what that would look like, because it might be a better representation of additional information to provide to the public. Thank you.

CHAIR YELLEN. Thank you. President Bullard.

MR. BULLARD. Thank you, Madam Chair. First of all, I also appreciate the work of the communications subcommittee and the staff on this subject, which I think is a complicated subject for the Committee.

I do support the proposal as laid out by the communications subcommittee. I consider it very important to represent uncertainty when we're communicating to the public. I agree with President Lockhart that maybe a picture is worth a thousand words. I'm uncomfortable with either the staff here at this meeting or us communicating anything to the public without putting something around the median projection that shows the amount of uncertainty, because, in general, the public tends to underappreciate the amount of uncertainty associated with economic outlooks. You can say in words that, okay, this is very uncertain. They might add $\frac{1}{2}$ percent and

subtract ½ percent when they should be adding 6 percent and subtracting 6 percent. So I think it's very important to make moves in this direction.

Now, I understand that any construction of uncertainty bands will have some inconsistencies. I think the subcommittee has taken an expedient approach here to get a first pass. We could do more later, depending on our experience with it if we use it at the March meeting. The Committee has done a good job of making the tradeoffs and thinking carefully about this.

I do think it gets us closer to meeting an international standard on this dimension. I agree that we don't have a consensus forecast. I would like to work toward that. I've proposed that in the past for this Committee. I understand that it's a hard thing for us to do, but that shouldn't preclude us from trying to represent the uncertainty about our projections. So I think it's an improvement.

I also agree with Governor Brainard that maybe we should look at the possibility of a subjective probability in the future. I'm not sure everyone will like it, because you do have to answer questions about upper and lower bounds and about what you think can happen. That's not the easiest thing to do, and it would make more work for all of us and all of our staffs. But maybe that would be a truer representation within the SEP context of the uncertainty that's surrounding those kinds of projections. With that, I do support the proposal. Thank you, Madam Chair.

CHAIR YELLEN. Thank you very much. President Evans.

MR. EVANS. Thank you, Madam Chair. I started off thinking I don't have a strong opinion about the inclusion of fan charts in the SEP. I guess the idea that they don't do any harm would make them sort of okay. I have to admit that Governor Brainard's comments about the

symmetry of the bands surrounding the projection is something I need to think carefully about. If that were to get in the way of our commentary about how we see the balance of risks as skewed in one direction and if, all of a sudden, people get confused about our comments about the balance of risks compared with this fan chart, the visual, that would be a concern.

I tended to think, coming in, that for the knowledgeable reader, the fan charts are a reasonable way of illustrating the uncertainties already presented in table 2 of the SEP, in which we give error bands. And I agree with the recommendation to construct them using the median projections and the historical root mean squared errors for a range of public and private forecasts, as we already do in table 2. Simple is best. I certainly take that point. But the thing that does make me nervous is a technical point. There's a difference between reporting error bands in the table and putting it in a chart where we're giving a composite hypothesis-type of projection, and I think that can be misleading. I have concerns that less knowledgeable readers may view any outcome that falls within the fan as being equally likely. Now, I expressed that to my staff, and they made fun of me because any line is zero probability. They're all sort of the same. But if you tried to construct some composite hypothesis and do some counting, the ones closest to the median would be higher likelihood than the ones farther apart. But you look at the fan, and it seems as though they both had that interpretation.

I would support conveying in some way that outcomes closer to the median are more likely than those toward the edges of the fan. To the knowledgeable readers, that sounds silly, but to the ones whom I'm worried about, maybe not. One way would be to note this in the explanatory text. Another way would be to show multiple probability bands, as some other central banks do, using the same methods that you do. I think this is manageable without any

added work. It would just be shading a little bit differently, with exactly the same calculations but 30 percent—whatever the choices would be. Maybe that would help.

Given our expected knowledgeable readership for this communications vehicle, I'm reasonably fine with the proposal, although, as I say, Governor Brainard's comments about the risk assessment—or my interpretation of them—do make me a little nervous. Thank you.

CHAIR YELLEN. President Kashkari.

MR. KASHKARI. Thank you. I support the proposed changes. And I'll just observe that, in my first meeting, I'm getting a sense of the complexity that the subcommittee on communications is dealing with.

MR. TARULLO. You ain't seen nothing yet. [Laughter]

MR. KASHKARI. But you have my great admiration, for, as you all are trying to balance the various tradeoffs, there are no easy answers. I'll just offer my observation with humility because I'm sure you've thought about these things before. The only concern I have is that I can envision a time when we may want to use forward policy guidance and we do not want to show such wide ranges on the expected outlook for the federal funds rate, and this could then be constraining in such a scenario. So I like Stan's suggestion to start simple and maybe add complexity over time. And if there was a way to embody the Committee's actual outlook of uncertainty, that may be helpful so that we're not constraining ourselves in the future.

CHAIR YELLEN. Thank you very much. Governor Powell.

MR. POWELL. Thank you, Madam Chair. I would like to add my support for the proposal. The addition of fan charts would pictorially emphasize uncertainty regarding macroeconomic projections and hence for the path of the policy rate. It would also show that the

uncertainty associated with the forecast is much greater than the dispersion of participants' views, which I think may be less well understood than some other things.

I'm also pleased that the subcommittee has taken a minimalist approach here, keeping it simple and avoiding difficult methodological and communications issues that lurk if one tries to do too much. So I do think that this approach is the most straightforward one to implement and the least likely to leave the public confused. Thank you, Madam Chair.

CHAIR YELLEN. Thank you. President Williams.

MR. WILLIAMS. Thank you, Madam Chair. I, too, support the proposal. Actually, Governor Brainard laid out the challenges on this matter that we discussed at length. As Todd and President Mester mentioned, we went back and forth on issues related to the various approaches that we could try to get at subjective assessments of the risks, those concerning the effective lower bound, and many of the other issues that have been brought up. In the end, what we're trying to accomplish here is something very simple, at least as a first step, and that is to get the point of data dependence out there as clearly as possible. Basically, you look at the median in the SEP, and it says you raise rates n times during a certain period, and all of the attention in the media and the markets is on the number n . The idea here is to say, "Yes, we think there's an appropriate policy rate path, but that's going to depend on what happens with economic growth, what happens with unemployment, and what happens with inflation." That's what any good policy strategy would have, and the path of policy will depend on economic circumstances, either up or down. That's really all we're accomplishing with this proposal, in my personal view.

This issue of bringing in subjective views is really important because we do already have in the SEP a description of people's assessment of the risks both in terms of the magnitude and in

terms of the direction. Here we basically are punting on that and saying this is only describing the normal historical relationship, and the SEP would still contain the discussion of whether the current circumstances are different from the past 20 years. Now, I think the idea of trying to collect better subjective information or something that could be quantitative about the assessment of the magnitude and the direction of the risks is an important step forward.

I do struggle with how to aggregate subjective views. We got to the median as a way to capture the center of the participants, but then, when you look over the history of the SEP, you'll see that there's a wide divergence of views about both the magnitude and the direction of the risks relative to history. It's rare that we all—all 19, using David Wilcox's number of views, or whatever number of views there are in this room—agree that the risks are to one side or the other or where they are. I think how to say “Here's a median forecast, and then here's a median assessment of the risks” actually doesn't work, because often it may be five or six people in the Committee who think the risks are to the downside. So the median, of course, would be neutral.

We do need to think about how to capture this information more effectively, and we couldn't figure it out, at least so far. This baby step, if you will, is to try to have both—the historical pattern of uncertainty along with the verbal description of the risks.

In the end, I agree with President Bullard about the long-run goal I still hold to—maybe we're the two left—that a consensus forecast and a way of representing the consensus views on the risks would be a great place to land at the end. I know that's been really hard in the past. I know the staff cringes whenever I even say the term “consensus forecast.” I can see Dave Reifschneider and David Wilcox not appreciating my perspective on this, but I do think the median forecast has already helped a bit to show that this may not be a terrible representation of the center of the Committee. And I think maybe further work that we do in terms of describing

the uncertainty will help us down the road toward what I think is the right ultimate goal, which is to have some way of representing quantitatively the views of the Committee. But, again, I support this first baby step, at least, on that longer road. Thank you.

CHAIR YELLEN. Vice Chairman.

VICE CHAIRMAN DUDLEY. Thank you, Madam Chair. I certainly see some benefit of adding fan charts to the SEP as proposed. The fan charts would emphasize that the SEP numbers just comprise a modal forecast, one of many possible outcomes. The charts would also emphasize that at longer time horizons, the level of uncertainty is very high. So I am willing to go along with this proposal. That said, I do have some concerns that I want to share with the Committee. The first one is, because the widths of the fan charts are based on historical experience and are unconditional, they're not really very informative. They don't take into consideration where you actually are on the business cycle and in terms of all of the other factors that are influencing the outcome. They're also going to change very slowly over time. Each quarter, you're going to publish a fan chart that looks essentially just like the fan chart from the last quarter. So they don't really contain a lot of information beyond the first time you put them out.

The second concern is that I'm a little bit less convinced than others about this difficulty of doing subjective histograms based on what people think about uncertainty, because we actually do this in our surveys of the primary dealers and the buy-side participants, and they seem able to construct these histograms. I guess I find it a little odd that we're asking others to construct histograms, but we say ourselves that we can't do it. If you were asked that question at the press conference, Madam Chair, I wonder how you would answer that.

The third concern is what President Kashkari raised. I think when we're at the effective lower bound and issuing forward guidance with a commitment, I don't know what the fan chart for the federal funds rate means in that context. I think it's very odd to have this wide fan chart for the federal funds rate when we're actually saying something that contradicts that. Another issue I have with the fan chart for the federal funds rate is, let's say we're at the lower bound, should the fan chart go below zero or not? That's actually pretty tricky. If you think it should go below zero, you're tacitly conceding that our target federal funds rate could go negative. If you don't put it below zero, you're essentially tacitly communicating that negative interest rates aren't on the table. So I feel that where you draw that lower bound on the federal funds rate chart is not completely irrelevant in terms of how we communicate. Obviously, in the appendix, you can explain why you've done it the way you've done it, but whether people will read the appendix and fully appreciate that is a question.

In terms of the histograms, I feel much more strongly about the federal funds rate projections than those for GDP, unemployment, and inflation. I think the biggest difficulties with these fan charts lie in the federal funds rate, as opposed to the real economic variables. I also think the federal funds rate is more germane to us, because this is something we actually actively control. So I guess I would like to see us try to do a dry run of histograms for the federal funds rate to see what they look like and how they compare with fan charts that were done on the root-mean-squared-error basis. I'd just like to see what they looked like. If they were better, then we could move to that approach, and if not, we could discard them.

CHAIR YELLEN. Would anybody else like to comment?

MR. LACKER. Madam Chair.

CHAIR YELLEN. President Lacker.

MR. LACKER. I support the idea of fan charts. I just want to talk about forward guidance and commitment. I don't think we've ever provided forward guidance with commitment. We've been very careful to word our forward guidance as a prediction about what our future selves will do. In that instance, I think a fan chart is perfectly appropriate. In fact, the fan chart would provide a great way to signal when we do choose to provide forward guidance with commitment, because then we would omit the fan.

CHAIR YELLEN. Would anyone—Todd, Stan, or anyone on the subcommittee—like to comment further on the issues?

MR. CLARK. One intermediate approach could be to add the funds rate to the set of questions that the Committee is asked their subjective views on, but not quantify it. You're currently asked whether the risk is balanced, to the upside, or to the downside for economic growth and inflation. We don't ask about the funds rate, so adding the funds rate to that set of questions could be a vehicle for providing the fan chart as the historical stuff and still have this discussion of our subjective views. When the two are out of line, we would say they're out of line: This is the Committee's judgment, and this is the historical stuff. So it could be an intermediate way of not requiring people to provide a probability distribution for the funds rate but still give us a subjective way of communicating, for example, forward guidance having implications or the lower bound having implications.

VICE CHAIRMAN DUDLEY. I guess I'd also be interested in seeing people's subjective assessment of the federal funds rate path even if we didn't actually share it with the public. It's useful information for the Committee, in my opinion.

CHAIR YELLEN. Governor Fischer.

MR. FISCHER. Well, the comments are very interesting, and most of them are things we thought about in the course of trying to figure out what to recommend. The staff that was working with us, and probably the whole staff, is incredibly inventive, and you can get charts that reflect bias or direction of the risk, downward or upward. You could also ask people for their distributions using histograms, as Bill Dudley suggests. I've also heard people say that it's an illusion to think the dealers are filling in those forms; they have a staff who fills in the forms for them.

VICE CHAIRMAN DUDLEY. It's usually the desk economist who sits at the fixed-income trading desk who does those forms, typically. Their backgrounds aren't that dissimilar to our backgrounds.

CHAIR YELLEN. Some of our backgrounds.

MR. FISCHER. Some of our backgrounds. But I do suggest that we go ahead with this, and that we really take into account the questions that have arisen and that we reflect. We'll come back to it in about six months' time and ask you to fill in two other questionnaires: One will ask you things about what we might want to put into the next one, and the other will ask about what comments you have on what we've done. We'll see if we can get better the next time we revise it, which would be somewhere down the road. That's the request I'd make.

With regard to Dennis Lockhart's question, how many hits this will get? Well, I think once the Chair is talking about it, the answer is "It's millions," particularly if it's the Chair's press conferences and if the media wants to pick that up. I exaggerate with "millions" probably, but it'll get a lot of attention, and then we can seek to improve it.

CHAIR YELLEN. Governor Brainard.

MS. BRAINARD. Yes. I was reflecting on Bill Dudley's last comment and the reality that March is going to be a very complicated time for policy, regardless. I wonder whether it might be possible to leave off the federal funds rate initially and give some further thought to it, because right now, you've made a pretty consequential decision to cut off the federal funds rate at the effective lower bound, so that's an important message that we would be conveying to the market. Maybe that's what we want to do, but I wonder, if this is not essential for March, whether you might want to phase it and do your economic variables in March and give further thought to the federal funds rate.

MR. CLARK. If I can clarify something, the current chart for the current target of the funds rate is not actually cut off.

MS. BRAINARD. Oh, I'm just looking at this picture.

MR. CLARK. It looks like it is, but it's not—Bill can correct me if I'm wrong. On the basis of the rise in rates in December and the future path with historical accuracy, we get very close to zero, but we are above zero. And then the text, in the mad rush to get things out, didn't get fully revised to go from the previous SEP to that SEP. So it is really close to zero, and we describe in the text that we think we would impose zero. But in that chart, we don't actually have to impose zero.

VICE CHAIRMAN DUDLEY. But if the path came down, then—

MR. CLARK. If the path came down again—

MR. ENGLISH. If the Committee was to choose to not truncate and allow the bottom of that fan chart to go below zero—

VICE CHAIRMAN DUDLEY. It's a consequential decision either way, though. That's the problem.

MS. BRAINARD. It's consequential. Do we really need to add that to the set of decisions?

CHAIR YELLEN. Well, I think doing it in two phases is pretty difficult and hard to communicate. So I do worry about introducing the first three, and then, at some later date, adding the federal funds rate. But I think the issue of whether the band potentially goes below zero is important. Did the subcommittee have a strong view that it should not go below zero?

MR. WILCOX. Can I just make a clarifying point? I think a literal interpretation of these bands is that, without any elaboration, they would imply that there's a 15 percent probability that the funds rate could be open to that interpretation—a 15 percent probability that the funds rate could go above or below the band. Is that correct?

MR. CLARK. Yes, that is correct. In the example sketched in the appendix to the memo, the SEP would have text saying, "We would choose to cut this off at zero. The Committee has not previously set the target for the federal funds rate below zero," and leave it at that. Now, it would be possible to go further and address that point.

MR. FISCHER. You could add a sentence saying that, without any commitment either way as to whether, in the future, the FOMC might or might not go outside this range.

CHAIR YELLEN. And the FOMC has taken quantitative easing measures, which could be interpreted as essentially the response when it would call for a below-zero rate. Presumably, you could clarify some of that in the verbal description in the appendix. Governor Tarullo, do you want to say something?

MR. TARULLO. I'm waiting to see which direction we're headed here.

CHAIR YELLEN. President Bullard.

MR. BULLARD. Yes, I have just a thought on this. The Committee has discussed the possibility of a negative policy rate during the past five years. We kicked it around, there are pros and cons, but the Committee never came down and actually did that. So I think that, at this point, you probably would cut it off, saying the Committee has not done that up to now. We reserve the right, of course, to do that in the future.

CHAIR YELLEN. But, presumably, the text would indicate that this is a convention and has no significance in terms of the Committee's policy options or intentions, that you've used a mechanical approach.

MR. CLARK. The other option, which I don't think the Committee would want to do, would be to follow the approach of the central banks that publish policy rate fan charts. Two of them, the Norges Bank and the Riksbank, just publish a fan that's plus or minus root mean squared errors. It goes below zero, and then, in the text, they say that this does not reflect asymmetries in the policy rate or constraints associated with the lower bound that we think may apply. I don't know if the Committee would desire that, but there is some precedent.

CHAIR YELLEN. Did you consider that approach? Because that that might be a reasonable alternative. President Kaplan.

MR. KAPLAN. I must admit listening to this, I am troubled about the federal funds rate, because I do think it is dramatically and completely different than forecasting exogenous factors. Forecasting the federal funds rate is basically, what do I predict I might do, and all of you around this table will do, in reaction to exogenous factors? My concern is, we're in an extremely sensitive period here in the next three to six months. I don't want to gum up the works, but it certainly seems to me, the risk/reward of getting this wrong is definitely asymmetrical. I would rather do a dry run, give the Committee a chance to look at sample charts on the federal funds

rate in March, and have another bite at this. I'm sensitive to all the work that's been done and how difficult it is to get a consensus, but the risks associated with this strike me as so asymmetrical. This is such a critical measure and one that we're in control of. I do think it is different than forecasting exogenous factors.

CHAIR YELLEN. Okay. President Bullard, go ahead.

MR. BULLARD. To respond to President Kaplan, sure, we control the funds rate, but we're also reacting to the other data. So if the other data come in in an extreme way, then you're going to choose a different value for the funds rate. This is representing that kind of uncertainty, which I thought was the point of this.

MR. KAPLAN. Except it's different from every other factor because it's a decision that we actually will make here. Better yet, voters rotate. You have a lot of other factors that we all, again, as a group are in control of. It's a different kind of factor to me. I'm not saying it should be treated differently, but I'd want to make sure we had a conviction around the table before we did this.

CHAIR YELLEN. Governor Fischer.

MR. FISCHER. Rob, the forecasters are forecasting, and some of them—very few—forecast the federal funds rate. But they forecast short-term rates that are very close to the federal funds rate, and they are aware of all of the factors you've mentioned—there's rotation on this Committee, et cetera. Yet they produce forecasts, and those forecasts will be the basis of the root mean squared errors that we use. So I see that it's different.

As you were talking, I was reflecting on an obituary yesterday in the *New York Times* for a guy called Marvin Minsky, who was a computer-thinking founder who said he made the critical breakthrough when he persuaded his colleagues that human beings think like machines

think, or that machines think like human beings think. And here we are—we're thinking in a particular way. We're predictable. It might not look like it, but we are, and I don't see what the huge difference is. We react to the environment, we react to each other, and we're probably fairly predictable, if we're good at it.

MR. KAPLAN. I guess I'm responding to the fact that this was done by the subcommittee on communications, which means this is more about communication than anything else, and I'm coming at it from that point of view. We may have conviction in this room, but as it is a PR communication issue, I think some good points have been raised. To me, as we're not under pressure to do this, I just want to make sure we're comfortable. This is a process point I'm raising. You may be right and probably are, but I don't want to create a self-inflicted wound, how's that?

CHAIR YELLEN. I hear you. Governor Tarullo, did you want to weigh in?

MR. TARULLO. I'd like to associate myself with President Kaplan's position.

CHAIR YELLEN. Does anybody else want to weigh in? I think some good points have been raised that require a bit of thought.

MR. FISCHER. Madam Chair, they've had a bit of thought. [Laughter]

CHAIR YELLEN. Yes, they have. Well, I think what I'd like to do is take a straw poll and get a sense of where the Committee is. We normally decide these matters by taking straw polls of all participants, and I'd like to get a sense of the overall view and the level of concern about this. Perhaps rather than utterly decide every detail about how we're going to go forward, after seeing what the straw vote looks like, we could sit down and talk again with the members of the subcommittee and the staff about whether there are some changes we can make in the approach, and, in particular, what I present in the press conference, which is going to be

important, and we haven't quite decided that. Maybe some changes are appropriate or some thought needs to go into that. But I'd like to take a straw poll. Can I see how many people would like to go forward with implementing the approach that the subcommittee has recommended?

MR. TARULLO. Madam Chair, I'm sorry. Could you state what the other position will be?

CHAIR YELLEN. That you would not want to proceed with this.

MR. TARULLO. At this time.

MR. HARKER. Yes, at this time.

MS. BRAINARD. In March.

CHAIR YELLEN. At this time.

VICE CHAIRMAN DUDLEY. Although I think it's March versus potentially later, right?

MS. BRAINARD. That's right.

CHAIR YELLEN. Well, maybe we should take that as a separate question.

VICE CHAIRMAN DUDLEY. Okay.

CHAIR YELLEN. Why don't we take the timing as separate question—whether we go forward in March, which is a consequential meeting, obviously, or we wait until a later time to move forward with this.

VICE CHAIRMAN DUDLEY. Madam Chair, I think the issue that was raised was that there are some questions to wrestle with. And I think some people prefer to wrestle with those questions and answer them definitively, with the presumption that they'll probably move affirmatively, versus just deciding now to move forward in March. That seems to be the real

question. I didn't get a strong sense that people are opposed to this, but I think there are some questions that people feel they really want to make sure are answered correctly, versus just going ahead with this proposal in March. Those do seem to be the two choices as I hear them.

MR. EVANS. I agree with Bill.

CHAIR YELLEN. You're okay with that?

MR. KAPLAN. I think it captures the discussion.

CHAIR YELLEN. Okay. So let me, then, first ask, how many people would like to go ahead in March to implement the proposal the subcommittee has recommended? At least one alternative, which I'll next ask about, is, how many people are favorably inclined toward going ahead but feel we should wait until a later date and sort out some of the questions on how we would approach this? So, first, how many people would like to simply go ahead in March as proposed? [Show of hands] Okay. How many people are supportive of this approach in introducing fan charts but would like to wait to think through some of the questions that have been raised, such as, on the symmetry issue, should fan charts go below zero as well as should we necessarily include a funds rate fan chart? I would think through, perhaps a little bit more carefully, exactly what I would present at the press conference, versus what would go into the SEP when it's published in the minutes. I'd like to see how many people would prefer to wait and think this through a bit more. [Show of hands] Okay.

And then, finally, is there anybody who thinks that this is just a bad idea—that we should not add fan charts and be done with this? Because we have considered this on many previous occasions. I would really not be willing to ask the subcommittee, which has done a huge amount of work and thought through a lot of issues, to go back and try to formulate a totally new proposal. Ironing out a few details is one thing I would be inclined to ask the subcommittee to

do, but going back and considering a significantly different approach, I wouldn't. How many people would just like to can this? [Show of hands]

MR. LOCKHART. I have to be consistent with what I said earlier, so I'll put my finger up.

CHAIR YELLEN. Okay. I guess I see a sufficient amount of discomfort with simply forging ahead with this in March to feel comfortable concluding that we should do that. And I would suggest that we sit down and discuss the issues that have been raised and how we might address them, and then we can return with a revised proposal on how we're going to do that.

GOVERNOR FISCHER. What did he put it up for?

CHAIR YELLEN. To can it.

VICE CHAIRMAN DUDLEY. If I could just interject one final thing. I think this issue about whether we're potentially willing to entertain a negative federal funds rate is important to this discussion. In other words, you can't do it just as a communication issue unless you actually know—

MR. ROSENGREN. The answer. [Laughter]

VICE CHAIRMAN DUDLEY. —what people think about that possibility.

MR. FISCHER. Bill, I don't think that's true. You can simply make a statement that there has been no decision on this issue, and they haven't been used in the past.

VICE CHAIRMAN DUDLEY. But if the Committee felt that this is something that just was ruled off the table, that could inform what kind of fan chart one would want to show for the federal funds rate, versus if the Committee decided this is something that's very definitely potentially on the table, that could inform a different decision on the fan charts. That's all I'm saying.

MR. FISCHER. We can draw a chart that is under specified assumptions, which we will say do not represent a Committee decision.

CHAIR YELLEN. Well, but you are proposing cutting it off at zero. Your proposal that you have on the table is to cut it off at zero. If we're not going to do that, maybe we should think it through, come back to the Committee, and let them know how we would propose to handle it.

MR. FISCHER. Well, I don't want to continue this discussion, but the fact is, as David said, that we're showing 70 percent confidence intervals. And there is a 90 percent confidence interval that you could also draw, which would probably go below.

MR. POTTER. I don't think there are parts of the band that are feasible when you do that. It's not feasible to get to minus 3 or minus 4, so that will be one issue. There's a mass point somewhere, and that would be the true lower bound, and you can't go past there.

VICE CHAIRMAN DUDLEY. Because of currency, you're saying.

MR. POTTER. Currency, or it's not effective.

MR. LACKER. Tangential.

CHAIR YELLEN. But wouldn't showing it going below that feasible lower bound simply say that conditions could materialize that would—historically, starting from a different level of the funds rate—have prompted a very large response that would take the funds rate below a meaningful lower bound, wherever it is, and you're illustrating that the Committee would have a number of options that could come into play? It may not be feasible to take the funds rate to minus 2, but further QE or other things certainly are feasible. President Mester.

MS. MESTER. I don't want to belabor this, but one of the principles when we went into this and when we got to the proposal was the simplicity, right? It was important that this be a simple thing. I may be mischaracterizing it, but the reason we said we'll truncate at zero is

precisely because we didn't want to signal anything about future policy decisions and we had a history that said we had never gone below zero. We thought that we could easily say that in words, and that, the first time we showed the fan charts, those points could be said very simply and we could take all this into consideration that we've just gone through about the tradeoffs and how we have QE that might get us below zero. The whole premise of this was, we need a simple way to communicate that there's uncertainty regarding these forecasts, it's bigger than the dispersion typically in the SEP, and our policy will be data dependent and respond to economic shocks to the economy. So that was the thought process about exactly why we truncated at zero, saying, "Because we've never been below zero, we're truncating this chart at zero. Of course, blah, blah, blah, blah, blah, we're not—." That was kind of the thought process. I just wanted to let you know the history of that.

CHAIR YELLEN. Well, an approach might be to clarify that in the appendix.

MS. MESTER. Exactly.

VICE CHAIRMAN DUDLEY. Yes, that might be a simple solution.

MS. MESTER. Right. When you talk at the press conference, presumably the first time you show these, you're going to want to have some words associated with them, because, unfortunately, the chart that you currently show at the press conference looks like a fan chart even though it's dispersion. And so you're going to want to have some words associated with that, and in those words you can say this.

VICE CHAIRMAN DUDLEY. Disagreement versus uncertainty.

CHAIR YELLEN. Okay. Would it be acceptable to the subcommittee to think through some of this, respond to some of these comments, and come back to the Committee? It may just

be a matter of clarifying some of the language in the appendix or perhaps waiting until June to go forward with this.

MR. FISCHER. Yes, I think it would be. We'll find a subcommittee that will deal with it. [Laughter]

MR. EVANS. This is a highly coveted position. I've already served my term, though. [Laughter]

CHAIR YELLEN. I should say that, as you know, this is not the first time we've had a conversation like this around the table, and it has always come to a similar fate.

MR. WILLIAMS. Nonetheless, we will try again. [Laughter]

CHAIR YELLEN. Okay. Thank you very much.

MR. FISCHER. Thank you, Madam Chair.

CHAIR YELLEN. The meeting is now adjourned, and the Board meeting is ended. We will next meet Tuesday and Wednesday, March 15 and 16. Lunch is served. And for those of you who can stay, Linda Robertson is prepared to give a legislative update.

END OF MEETING