Minutes of the Federal Open Market Committee
March 17–18, 2015

A meeting of the Federal Open Market Committee was held in the offices of the Board of Governors of the Federal Reserve System in Washington, D.C., on Tuesday, March 17, 2015, at 10:30 a.m. and continued on Wednesday, March 18, 2015, at 9:00 a.m.

PRESENT:

Janet L. Yellen, Chair
William C. Dudley, Vice Chairman
Lael Brainard
Charles L. Evans
Stanley Fischer
Jeffrey M. Lacker
Dennis P. Lockhart
Jerome H. Powell
Daniel K. Tarullo
John C. Williams

James Bullard, Christine Cumming, Esther L. George, Loretta J. Mester, and Eric Rosengren, Alternate Members of the Federal Open Market Committee

Narayana Kocherlakota, President of the Federal Reserve Bank of Minneapolis

Helen E. Holcomb and Blake Prichard, First Vice Presidents, Federal Reserve Banks of Dallas and Philadelphia, respectively

Thomas Laubach, Secretary and Economist
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
David W. Wilcox, Economist

David Altig, Thomas A. Connors, Michael P. Leahy, William R. Nelson, Glenn D. Rudebusch, Daniel G. Sullivan, William Wascher, and John A. Weinberg, Associate Economists

Simon Potter, Manager, System Open Market Account

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

Robert deV. Frierson,[1] Secretary of the Board, Office of the Secretary, Board of Governors

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

James A. Clouse, Deputy Director, Division of Monetary Affairs, Board of Governors

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

Andrew Figura, 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

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

Fabio M. Natalucci[2] and Gretchen C. Weinbach,[1] Associate Directors, Division of Monetary Affairs, Board of Governors

Jane E. Ihrig and David López-Salido, Deputy Associate Directors, Division of Monetary Affairs, Board of Governors; John J. Stevens, Deputy Associate Director, Division of Research and Statistics, Board of Governors

[1] Attended the joint session of the Federal Open Market Committee and the Board of Governors.
[2] Attended the portion of the meeting following the joint session of the Federal Open Market Committee and the Board of Governors.

Glenn Follette, Assistant Director, Division of Research and Statistics, Board of Governors; Elizabeth Klee, Assistant Director, Division of Monetary Affairs, Board of Governors

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

Dana L. Burnett and Don Kim, Section Chiefs, Division of Monetary Affairs, Board of Governors

Katie Ross,[1] Manager, Office of the Secretary, Board of Governors

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

Zeynep Senyuz, Economist, Division of Monetary Affairs, Board of Governors

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

Ron Feldman, Executive Vice President, Federal Reserve Bank of Minneapolis

Michael Dotsey, Craig S. Hakkio, Evan F. Koenig, and Paolo A. Pesenti, Senior Vice Presidents, Federal Reserve Banks of Philadelphia, Kansas City, Dallas, and New York, respectively

David Andolfatto, Todd E. Clark, Antoine Martin, Joe Peek, and Douglas Tillett, Vice Presidents, Federal Reserve Banks of St. Louis, Cleveland, New York, Boston, and Chicago, respectively

Developments in Financial Markets and the Federal Reserve's Balance Sheet

In a joint session of the Federal Open Market Committee (FOMC) and the Board of Governors of the Federal Reserve System, the manager of the System Open Market Account (SOMA) reported on developments in domestic and foreign financial markets. The deputy manager followed with a review of System open market operations conducted during the period since the Committee met on January 27–28, 2015. The deputy manager also discussed the outcomes of recent tests of supplementary normalization tools—namely, the Term Deposit Facility (TDF) and term and overnight reverse repurchase agreement operations (term RRP operations and ON RRP operations, respectively). The TDF operations were executed as three overlapping 21-day term operations with same-day settlement; the total amount of term deposits outstanding peaked at roughly the same level as in the largest operation conducted in prior testing. The term RRP operations were executed as a series of four one-week operations and conducted away from quarter-end; take-up primarily represented substitution away from ON RRP operations. The combination of these term and ON RRP test operations continued to provide a soft floor for money market rates over the intermeeting period.

By unanimous vote, the Committee ratified the Open Market Desk's domestic transactions over the intermeeting period. There were no intervention operations in foreign currencies for the System's account over the intermeeting period.

Normalization Tools

A staff briefing provided background on options for setting the aggregate capacity of the ON RRP facility in the early stages of the normalization process. Two options were discussed: initially setting a temporarily elevated aggregate cap or suspending the aggregate cap for a time. The briefing noted that, as the balance sheet normalizes and reserve balances decline, usage of the ON RRP facility should diminish, allowing the facility to be phased out over time. In addition, the briefing outlined strategies for actively reducing take-up at the ON RRP facility after policy normalization is under way, while maintaining an appropriate degree of monetary control, if take-up is larger than the FOMC desires. These strategies included adjusting the values of the interest on excess reserves (IOER) and ON RRP rates associated with a given target range for the federal funds rate, relying on tools such as term RRPs and the TDF to broaden arbitrage opportunities and to drain reserve balances, and selling shorter-term Treasury securities to reduce the size of the balance sheet at a faster pace. In addition, the briefing presented some information on specific calibrations of policy tools that could be used during the early stages of policy normalization.

In their discussion of the options and strategies surrounding the use of tools at liftoff and the potential subsequent reduction in aggregate ON RRP capacity, participants emphasized that during the early stages of policy normalization, it will be a priority to ensure appropriate control over the federal funds rate and other short-term interest rates. Against this backdrop, participants generally saw some advantages to a temporarily elevated aggregate cap or a temporary suspension of the cap to ensure that the facility would have sufficient capacity to support policy implementation at the time of liftoff, but they also indicated that they expected that it would be appropriate to reduce ON RRP capacity fairly soon after

the Committee begins firming the stance of policy. A couple of participants stated their view that the risks to financial stability that might arise from a temporarily elevated aggregate ON RRP capacity were likely to be small, and it was noted that there might be little potential for a temporarily large Federal Reserve presence in money markets to affect the structure of those markets if plans for reducing the facility's capacity were clearly communicated and well understood. However, a couple of participants expressed financial stability concerns, and one stressed that more planning was needed to address the potential risks before the Committee decides on the appropriate level of ON RRP capacity at the time of liftoff.

In their discussion regarding strategies for reducing ON RRP usage, should it become undesirably large during the early stages of normalization, most participants viewed raising the IOER rate, thereby widening the spread between the IOER and ON RRP rates, as an appropriate initial step. A majority of participants thought term reserve draining tools could be useful in reducing ON RRP usage, although a couple of participants questioned their effectiveness in placing upward pressure on market interest rates, and a few did not see term RRPs as reducing the Federal Reserve's presence in money markets, arguing that investors view term and overnight RRPs as close substitutes. Many participants mentioned that selling assets that will mature in a relatively short time could be considered at some stage, if necessary to reduce ON RRP usage. However, a number of participants noted that it could be difficult to communicate the reason for such sales to the public, and, in particular, that the announcement of such sales would risk an outsized market reaction, as the public could view the sales as a signal of a tighter overall stance of monetary policy than they had anticipated or as an indication that the Committee might be more willing than had been thought to sell longer-term assets. Some participants pointed out that an earlier end to reinvestments of principal on maturing or prepaying securities would help reduce the level of reserve balances, thereby increasing the effectiveness of the IOER rate and allowing a more rapid reduction in the size of the ON RRP facility. A number of participants suggested that it would be useful to consider specific plans for these and other details of policy normalization under a range of post-liftoff scenarios.

Participants also discussed whether to communicate to the public additional details regarding the approach they intend to take when it becomes appropriate to begin the normalization process, including the width of the target range for the federal funds rate, the settings of the IOER and ON RRP rates, and the use of supplementary tools. A couple of participants suggested communicating a specific commitment to reducing ON RRP capacity soon after liftoff. However, a number of participants emphasized that maintaining control of short-term interest rates would be paramount in the initial stages of policy normalization, and that it was difficult to know in advance when a reduction would be appropriate. They therefore desired to retain some flexibility over the timing of any reduction. That said, many participants agreed that an elevated aggregate capacity for the facility would likely be appropriate only for a short period after liftoff.

At the conclusion of their discussion, all participants agreed to augment the Committee's Policy Normalization Principles and Plans by providing the following additional details regarding the operational approach the FOMC intends to use when it becomes appropriate to begin normalizing the stance of monetary policy.[3]

When economic conditions warrant the commencement of policy firming, the Federal Reserve intends to:

- Continue to target a range for the federal funds rate that is 25 basis points wide.
- Set the IOER rate equal to the top of the target range for the federal funds rate and set the offering rate associated with an ON RRP facility equal to the bottom of the target range for the federal funds rate.
- Allow aggregate capacity of the ON RRP facility to be temporarily elevated to support policy implementation; adjust the IOER rate and the parameters of the ON RRP facility, and use other tools such as term operations, as necessary for appropriate monetary control, based on policymakers' assessments of the efficacy and costs of their tools. The Committee expects that it will be appropriate to reduce the capacity of the facility fairly soon after it commences policy firming.

A staff briefing outlined some options for further testing of term RRP operations over future quarter-ends. While the tests of term RRPs to date had been informative, the staff suggested that if the Committee envisioned using

[3] The statement titled Policy Normalization Principles and Plans is available on the Board's website at www.federalreserve.gov/newsevents/press/monetary/20140917c.htm.

term RRPs as part of its strategy at liftoff, or potentially at some other point during normalization, continued testing may be useful. Participants discussed whether a resolution that authorized term RRP test operations at quarter-ends through the end of 2015 might reduce the probability that market participants mistakenly interpret future decisions about testing term RRPs over quarter-ends as containing information about the likely timing of liftoff. It was noted that such a resolution would be more efficient from an administrative and communications standpoint, as it would simply allow a continuation of recent quarter-end testing of term RRPs. Moreover, the resolution would not convey any information regarding either the timing of the start of policy normalization or whether term RRP operations might be employed at the time of liftoff and, if so, for how long.

Following the discussion of the testing of term RRP operations, the Committee approved the following resolution on term RRP testing over quarter-ends through January 29, 2016:

> "During each of the periods of June 18 to 29, 2015; September 18 to 29, 2015; and December 17 to 30, 2015, the Federal Open Market Committee (FOMC) authorizes the Federal Reserve Bank of New York to conduct a series of term reverse repurchase operations involving U.S. government securities. Such operations shall: (i) mature no later than July 8, 2015, October 7, 2015, and January 8, 2016, respectively; (ii) be subject to an overall size limit of $300 billion outstanding at any one time; (iii) be subject to a maximum bid rate of five basis points above the ON RRP offering rate in effect on the day of the operation; (iv) be awarded to all submitters: (A) at the highest submitted rate if the sum of the bids received is less than or equal to the preannounced size of the operation, or (B) at the stop-out rate, determined by evaluating bids in ascending order by submitted rate up to the point at which the total quantity of bids equals the preannounced size of the operation, with all bids below this rate awarded in full at the stop-out rate and all bids at the stop-out rate awarded on a pro rata basis, if the sum of the counterparty offers received is greater than the preannounced size of the operation. Such operations may be for forward settlement. The System Open Market Account manager will inform the FOMC in advance of the terms of the planned operations. The Chair must approve the terms of, timing of the announcement of, and timing of the operations. These operations shall be conducted in addition to the authorized overnight reverse repurchase agreements, which remain subject to a separate overall size limit authorized by the FOMC."

Mr. Lacker dissented in the vote on the resolution because the March end-of-quarter testing had not yet been completed and he felt that there was no need to authorize additional testing before then.

The Board meeting concluded at the end of the discussion of normalization tools.

Staff Review of the Economic Situation

The information reviewed for the March 17–18 meeting suggested that real gross domestic product (GDP) growth moderated in the first quarter and that labor market conditions improved further. Consumer price inflation was restrained significantly by declines in energy prices and continued to run below the FOMC's longer-run objective of 2 percent. Market-based measures of inflation compensation were still low, while survey measures of longer-run inflation expectations remained stable.

Nonfarm payroll employment continued to expand strongly in January and February. The unemployment rate declined to 5.5 percent in February. Both the labor force participation rate and the employment-to-population ratio rose slightly over the first two months of the year, and the share of workers employed part time for economic reasons edged down. The rate of private-sector job openings moved up in January and was at an elevated level; the rate of quits remained the same as in the fourth quarter, but the rate of hiring stepped down.

Industrial production decreased a little, on net, in January and February, as declines in the output of the manufacturing and mining sectors more than offset an increase in utilities production. Some indicators of mining activity, such as counts of drilling rigs in operation, dropped further. However, automakers' assembly schedules and broader indicators of manufacturing production, such as the readings on new orders from national and regional manufacturing surveys, generally pointed to modest gains in factory output in coming months.

Real personal consumption expenditures (PCE) appeared to decelerate somewhat going into the first quarter after rising markedly in the fourth quarter. The components of the nominal retail sales data used by the Bureau of Economic Analysis to construct its estimate of PCE declined slightly in January and February, and light

motor vehicle sales stepped down; unusually severe weather in some regions in February may have accounted for a small part of the slowing in consumer spending in that month. Recent information about key factors that influence household spending pointed toward a pickup in PCE in the coming months. The purchasing power of households' income continued to be supported by low energy prices, and real disposable income rose briskly in January. Moreover, households' net worth likely increased as equity prices and home values advanced further, and consumer sentiment in the University of Michigan Surveys of Consumers was still near its highest level since prior to the most recent recession.

The pace of activity in the housing sector remained slow. Both starts and building permits for new single-family homes declined over January and February. Starts of multifamily units also decreased, on net, over the past two months. Sales of new and existing homes moved down in January, although pending home sales increased somewhat.

Real private expenditures for business equipment and intellectual property products appeared to be expanding in the first quarter at about the same modest pace as in the previous quarter. Both nominal orders and shipments of nondefense capital goods excluding aircraft rose in January. New orders for these capital goods remained above the level of shipments, indicating that shipments may increase in subsequent months. Other forward-looking indicators, such as national and regional surveys of business conditions, were generally consistent with modest increases in business equipment spending in the near term. Firms' nominal spending for nonresidential structures moved down in January after rising in the fourth quarter.

Federal spending data for January and February pointed toward a further decline in real federal government purchases in the first quarter. Real state and local government purchases appeared to be rising modestly in the first quarter as their payrolls increased in recent months, although their construction expenditures decreased a little in January.

The U.S. international trade deficit widened substantially in December before narrowing somewhat in January. Exports declined in both December and January, reflecting weak agricultural goods exports, the lower price of petroleum products, and falling or flat exports of most other categories of goods. Imports rose in December, with an increased volume of petroleum imports, but declined in January, driven by lower prices and volumes for petroleum.

Total U.S. consumer prices, as measured by the PCE price index, edged up only ¼ percent over the 12 months ending in January, as energy prices declined significantly. The core PCE price index, which excludes food and energy prices, rose 1¼ percent over the same 12-month period. Measures of expected long-run inflation from a variety of surveys, including the Michigan survey, the *Blue Chip Economic Indicators,* the Survey of Professional Forecasters, and the Desk's Survey of Primary Dealers, remained stable. Market-based measures of inflation compensation were still low. Measures of labor compensation continued to increase at a modest pace, although faster than consumer prices. Both compensation per hour in the nonfarm business sector and the employment cost index rose 2¼ percent over the year ending in the fourth quarter. Average hourly earnings for all employees increased 2 percent over the 12 months ending in February.

Foreign real GDP appeared to expand at a moderate pace in the fourth quarter. While GDP growth stepped down in several economies, including Canada and China, it picked up in the euro area, Japan, and Mexico. Indicators for the first quarter suggested continued firming in the euro area and further slowing in China and Canada. Consumer prices in many foreign economies declined further in the first months of this year, reflecting the falls in energy prices as well as decreases in food prices in some emerging market economies. Many central banks took steps to ease monetary policy during the period, including the European Central Bank (ECB), which began purchasing sovereign bonds under its public sector purchase program (PSPP), and the People's Bank of China, which lowered required reserve ratios for banks. A number of other central banks in advanced and emerging market economies cut policy interest rates.

Staff Review of the Financial Situation

Movements in asset prices over the intermeeting period largely seemed to reflect receding concerns about downside risks to the global economic outlook. Two strong U.S. employment reports and the January consumer price index release, all of which were above market expectations; the start of sovereign bond purchases by the ECB; and the somewhat more encouraging economic news from Europe all appeared to contribute to the improved sentiment in financial markets. Equity prices were higher, on net, although they declined later in the period.

Federal Reserve communications over the intermeeting period, including the minutes of the January FOMC

meeting, reportedly were perceived as slightly more accommodative than expected on balance. Market commentary also highlighted Chair Yellen's statement at the *Monetary Policy Report* testimony that the eventual removal of the language in the policy statement noting that "the Committee judges that it can be patient in beginning to normalize the stance of monetary policy" should not be viewed as indicating that the federal funds rate would necessarily be increased within a couple of meetings. However, the effects of these communications on the expected path for the federal funds rate were more than offset by reactions to stronger-than-expected data for the labor market and consumer inflation, along with perceptions of receding downside risks to the foreign economic outlook. On net, the expected path for the federal funds rate implied by financial market quotes shifted up over the period.

Yields on nominal Treasury securities increased across the maturity spectrum, and the Treasury yield curve steepened. Measures of inflation compensation based on Treasury Inflation-Protected Securities increased early in the intermeeting period amid rising oil prices but ended the period little changed, on net, after oil prices dropped back.

Broad U.S. equity price indexes moved up, on balance, over the intermeeting period, and one-month option-implied volatility on the S&P 500 index moved down on net. Spreads of 10-year corporate bond yields over those on comparable-maturity Treasury securities for both BBB-rated and speculative-grade issuers narrowed notably, likely reflecting increased appetite for riskier investments. While the tightening of spreads was broad based, the declines in short- and intermediate-term spreads for speculative-grade energy firms were particularly pronounced, retracing most of their strong run-up approaching the end of last year.

Results from the Desk's Survey of Primary Dealers and Survey of Market Participants for March indicated that the respondents attached the greatest probabilities to the first increase in the target range for the federal funds rate occurring at either the June or September FOMC meeting; those probabilities were marked up relative to the January survey. In addition, survey respondents widely expected the "patient" language to be removed from the FOMC statement following the March meeting. Conditional on this change in the statement, respondents assigned a roughly 40 percent probability, on average, to liftoff occurring two meetings ahead and assigned most of the remaining probability to later dates.

Credit conditions faced by large nonfinancial firms remained generally accommodative. Corporate bond issuance increased in February, mostly reflecting activity by investment-grade firms. Commercial and industrial loans on banks' books continued to expand strongly, reportedly in part to fund increased merger and acquisition activity. Institutional leveraged loan issuance during January and February was supported by strong issuance of new money loans, while refinancing activity effectively came to a stop, likely reflecting elevated loan spreads. On net, issuance of collateralized loan obligations was only modestly below the strong pace registered in the fourth quarter of 2014.

Financing for the commercial real estate (CRE) sector stayed broadly available over the intermeeting period. Growth of CRE loans on banks' books remained solid, in part supported by loans to finance construction activity. The issuance of commercial mortgage-backed securities (CMBS) was still robust so far this year, and spreads continued to be low. After taking into account deals in the pipeline for March, issuance in the first quarter of 2015 was expected to be the strongest since the financial crisis. According to the March Senior Credit Officer Opinion Survey on Dealer Financing Terms, dealers' willingness to provide warehouse financing for loans intended for inclusion in CMBS increased since the beginning of 2014. In addition, demand for funding of CMBS by hedge funds and real estate investment trusts reportedly rose over the same period.

Credit conditions for mortgages remained tight for riskier borrowers, with relatively few mortgages originated to borrowers in the lower portion of the credit score distribution. For borrowers who qualify for a mortgage, the cost of credit stayed low by historical standards.

Consumer credit rose further over the intermeeting period. Auto and student loan balances continued to expand robustly through January, while credit card balances decelerated slightly. Issuance of consumer asset-backed securities remained robust.

The dollar appreciated against most other currencies over the intermeeting period, as policymakers in the euro area, Sweden, Denmark, and many emerging market economies eased monetary policy even as market participants anticipated monetary policy tightening in the United States. Central bank policymakers in Sweden and Denmark lowered the rates on their respective deposit facilities further below zero. In addition, in Sweden, the benchmark repurchase agreement (or repo) rate was reduced in February to below zero for the first time, and a further cut was announced in March. Equity prices rose

in most of the advanced foreign economies, with euro-area stocks rallying both before and after the early March commencement of sovereign bond purchases by the ECB under its PSPP. Stock market performance in the emerging market economies was more varied, with net losses in some and net gains in others. Yields on German government securities declined, with negative yields extending to longer maturities than at the time of the January meeting, likely in reaction to the PSPP, and yield spreads of most other euro-area sovereign bonds over German bonds narrowed. The main exception was Greek bonds, spreads on which widened, on net, amid heightened volatility as negotiations between Greece and its official creditors over support for the country's public finances continued. Yields on the long-term sovereign bonds of many other countries, including Japan and the United Kingdom, rose during the period.

Staff Economic Outlook

In the U.S. economic forecast prepared by the staff for the March FOMC meeting, projected real GDP growth in the first half of this year was lower than in the forecast prepared for the January meeting, largely reflecting downward revisions to the near-term forecasts for household spending, net exports, and residential investment. The staff's medium-term forecast for real GDP growth also was revised down, mostly because of the effects of a higher projected path for the foreign exchange value of the dollar. Nonetheless, the staff continued to forecast that real GDP would expand at a faster pace than potential output in 2015 and 2016, supported by increases in consumer and business confidence and a small pickup in foreign economic growth, even as the normalization of monetary policy was assumed to begin. In 2017, real GDP growth was projected to slow toward, but to remain above, the rate of potential output growth. The expansion in economic activity over the medium term was anticipated to gradually reduce resource slack; the unemployment rate was expected to decline slowly and to temporarily move a little below the staff's estimate of its longer-run natural rate. In its medium-term and longer-run projections, the staff slightly lowered its assumptions for potential GDP growth and real equilibrium interest rates.

The staff's forecast for inflation in the near term was little changed, with the large declines in energy prices since last June still anticipated to lead to a temporary decrease in the 12-month change in total PCE prices in the first half of this year. The staff's forecast for inflation in 2016 and 2017 was unchanged, as energy prices and non-oil import prices were still expected to bottom out and begin rising later this year; inflation was projected to move closer to, but remain below, the Committee's longer-run objective of 2 percent over those years. Inflation was anticipated to move back to 2 percent thereafter, with inflation expectations in the longer run assumed to be consistent with the Committee's objective and slack in labor and product markets projected to have waned.

The staff viewed the extent of uncertainty around its March projections for real GDP growth, the unemployment rate, and inflation as similar to the average over the past 20 years. The risks to the forecasts for real GDP growth and inflation were viewed as tilted a little to the downside, reflecting the staff's assessment that neither monetary policy nor fiscal policy was well positioned to help the economy withstand adverse shocks. At the same time, the staff viewed the risks around its outlook for the unemployment rate as roughly balanced.

Participants' Views on Current Conditions and the Economic Outlook

In conjunction with this FOMC meeting, members of the Board of Governors and participating Federal Reserve Bank presidents submitted their projections of the most likely outcomes for real GDP growth, the unemployment rate, inflation, and the federal funds rate for each year from 2015 through 2017 and over the longer run, conditional on each participant's judgment of appropriate monetary policy.[4] The longer-run projections represent each participant's assessment of the rate to which each variable would be expected to converge, over time, under appropriate monetary policy and in the absence of further shocks to the economy. These economic projections and policy assessments are described in the Summary of Economic Projections, which is attached as an addendum to these minutes.

In their discussion of the economic situation and the outlook, meeting participants regarded the information received over the intermeeting period as indicating that the pace of economic activity had moderated somewhat. Labor market conditions continued to improve, with strong job gains and a lower unemployment rate, and

[4] The president of the Federal Reserve Bank of Dallas did not participate in this FOMC meeting, and the incoming president of the Federal Reserve Bank of Philadelphia is scheduled to assume office on July 1. Helen E. Holcomb and Blake Prichard, First Vice Presidents of the Federal Reserve Banks of Dallas and Philadelphia, respectively, submitted economic projections.

participants judged that underutilization of labor resources was continuing to diminish. A number of participants noted that slow growth of productivity or the labor force could reconcile the moderation in economic growth with the solid performance of some labor market indicators. Participants expected that, over the medium term, real economic activity would expand at a moderate pace and there would be additional improvements in labor market conditions. Participants generally regarded the net effect of declines in energy prices as likely to be positive for economic activity and employment in the United States, although a couple noted that physical limits on the accumulation of stocks of crude oil could result in further downward pressure on prices and reduce U.S. oil and gas production and investment. Inflation had declined further below the Committee's longer-run objective, largely reflecting declines in energy prices, and was expected to stay near its recent low level in the near term. Market-based measures of inflation compensation 5 to 10 years ahead remained low, while survey-based measures of longer-term inflation expectations had remained stable. Participants generally anticipated that inflation would rise gradually toward the Committee's 2 percent objective as the labor market improved further and the transitory effects of energy price declines and other factors dissipated. While almost all participants noted potential risks to the economic outlook resulting from foreign economic and financial developments, most saw the risks to the outlook for economic growth and the labor market as nearly balanced.

Household spending appeared to have slowed somewhat over the intermeeting period, with some participants suggesting that the recent softness in spending indicators was likely due in part to transitory factors, such as unseasonably cold winter weather in parts of the country. Some participants expressed the view that growth in consumer spending over the medium term would be supported by the strong labor market and rising income, increases in wealth and improvements in household balance sheets, lower gasoline prices, and gains in consumer confidence. Although activity in the housing sector remained sluggish, a few participants were cautiously optimistic that recent higher rates of household formation, together with low mortgage rates, would enable a faster pace of recovery.

Business contacts in many parts of the country continued to express optimism about prospects for future sales or investment. However, there were widespread reports of a slowdown in growth during the first quarter across a range of industries, partly reflecting severe winter weather in some regions as well as labor disputes at West Coast ports that temporarily disrupted some supply chains. In several parts of the country, persistently low oil prices had resulted in declines in drilling and delays in planned capital expenditures in the energy sector, and had negatively affected state government revenues. Manufacturing contacts in a couple of regions reported a softening in export sales. In contrast, service-sector activity had been reasonably strong in several parts of the country, as had auto sales, and the increase in household purchasing power from lower gasoline prices was expected to boost retail sales. Labor market conditions continued to improve in most regions, with wage pressures generally reported to be modest.

In their discussion of the foreign economic outlook, several participants noted that the dollar's further appreciation over the intermeeting period was likely to restrain U.S. net exports and economic growth for a time. A few participants suggested that accommodative policy actions by a number of foreign central banks could lead to a further appreciation of the dollar, but another noted that such actions had also strengthened the outlook for growth abroad, which would bolster U.S. exports. Participants pointed to a number of risks to the international economic outlook, including the slowdown in growth in China, fiscal and financial problems in Greece, and geopolitical tensions.

Participants saw broad-based improvement in labor market conditions over the intermeeting period, including strong gains in payroll employment and a further reduction in the unemployment rate. Several participants judged, based on the improvement in a variety of labor market indicators, that the economy was making further progress toward the Committee's goal of maximum employment. Nonetheless, many judged that some degree of labor market slack remained, as evidenced by the low rate of labor force participation, still-elevated involuntary part-time employment, or subdued growth in wages. A few of them noted that continued modest wage growth could prompt them to reduce their estimates of the longer-run normal rate of unemployment. A few participants observed that the absence of a notable pickup in wages might not be a useful yardstick for evaluating the degree of remaining slack because of the long lags between declines in unemployment and the response of wages or uncertainty about trend productivity growth. One participant, however, saw some evidence of rising wage growth and suggested that compositional changes in the labor force could be masking underlying wage pressures, particularly as measured by average hourly earnings.

Many participants judged that the inflation data received over the intermeeting period had been about in line with their expectations that inflation would move temporarily further below the Committee's goal, largely reflecting declines in energy prices and lower prices of non-oil imports. They continued to expect that inflation would move up toward the Committee's 2 percent objective over the medium term as the effects of these transitory factors waned and conditions in the labor market improved further. Survey-based measures of inflation expectations had remained stable, and market-based measures of inflation compensation over the longer term were about unchanged from the time of the January meeting, although they had exhibited some volatility over the intermeeting period. It was noted that the market-based measures had tracked quite closely the movements in crude oil prices over the period, first rising and then falling back. Participants offered various explanations for this correlation, including that market-based measures of inflation compensation were responding to the same global developments as oil prices, that these measures were capturing changes in risk or liquidity premiums, or that inflation-indexed securities were subject to mispricing. A couple of participants pointed out that the movements in crude oil prices and market-based inflation compensation measures had not been particularly well aligned over a longer historical period, or that information gleaned from inflation derivatives suggested a substantial increase in the probability that inflation would remain well below the Committee's target over the next decade. One of them judged that the low level of inflation compensation could reflect increased concern on the part of investors about adverse outcomes in which low inflation was accompanied by weak economic activity, and that it was important not to dismiss this possible interpretation.

In their discussion of communications regarding the path of the federal funds rate over the medium term, almost all participants favored removing from the forward guidance in the Committee's postmeeting statement the indication that the Committee would be patient in beginning to normalize the stance of monetary policy. These participants continued to think that an increase in the target range for the federal funds rate was unlikely in April. But, with continued improvement in economic conditions, they preferred language that would provide the Committee with the flexibility to subsequently adjust the target range for the federal funds rate on a meeting-by-meeting basis. It was noted that eliminating the reference to being patient would be appropriate in light of the considerable progress achieved toward the Committee's objective of maximum employment, and that such a change would not indicate that the Committee had decided on the timing of the initial increase in the target range for the federal funds rate. Participants generally judged that the appropriate timing of liftoff would depend on their assessment of improvement in the labor market and their degree of confidence that inflation would move back to the Committee's 2 percent objective over the medium term, and that it would be helpful to convey to the public this data-dependent approach to monetary policy. A few participants emphasized that the decision regarding the appropriate timing of liftoff should take account of the risks that could be associated with departing from the effective lower bound later and those that could be associated with departing earlier. One participant did not favor the change to the forward guidance because, with inflation well below the Committee's 2 percent longer-run target, the announcement of a meeting-by-meeting approach to policy could lead to a tightening of financial conditions that would slow progress toward the Committee's objectives.

Participants expressed a range of views about how they would assess the outlook for inflation and when they might deem it appropriate to begin removing policy accommodation. It was noted that there were no simple criteria for such a judgment, and, in particular, that, in a context of progress toward maximum employment and reasonable confidence that inflation will move back to 2 percent over the medium term, the normalization process could be initiated prior to seeing increases in core price inflation or wage inflation. Further improvement in the labor market, a stabilization of energy prices, and a leveling out of the foreign exchange value of the dollar were all seen as helpful in establishing confidence that inflation would turn up. Several participants judged that the economic data and outlook were likely to warrant beginning normalization at the June meeting. However, others anticipated that the effects of energy price declines and the dollar's appreciation would continue to weigh on inflation in the near term, suggesting that conditions likely would not be appropriate to begin raising rates until later in the year, and a couple of participants suggested that the economic outlook likely would not call for liftoff until 2016. With regard to communications about the timing of the first increase in the target range for the federal funds rate, two participants thought that the Committee should seek to signal its policy intentions at the meeting before liftoff appeared likely, but two others judged that doing so would be inconsistent

with a meeting-by-meeting approach. Finally, many participants commented that it would be desirable to provide additional information to the public about the Committee's strategy for policy after the beginning of normalization. Some participants emphasized that the stance of policy would remain highly accommodative even after the first increase in the target range for the federal funds rate, and several noted that they expected economic developments would call for a fairly gradual pace of normalization or that a data-dependent approach would not necessarily dictate increases in the target range at every meeting.

Committee Policy Action

In their discussion of monetary policy for the period ahead, members judged that information received since the FOMC met in January indicated that economic growth had moderated somewhat. Labor market conditions had improved further, with strong job gains and a lower unemployment rate; a variety of labor market indicators suggested that the underutilization of labor resources continued to diminish. Household spending was rising moderately, with declines in energy prices boosting household purchasing power. Business fixed investment was advancing, although the recovery in the housing sector remained slow and export growth had weakened. Inflation had declined further below the Committee's longer-run objective, largely reflecting the declines in energy prices. Market-based measures of inflation compensation remained low; survey-based measures of longer-term inflation expectations had been stable. The Committee expected that, with appropriate monetary policy accommodation, economic activity would expand at a moderate pace and labor market indicators would continue to move toward levels the Committee judges consistent with its dual mandate. The Committee also expected that inflation would remain near its recent low level in the near term but rise gradually toward 2 percent over the medium term as the labor market improves further and the transitory effects of energy price declines and other factors dissipate. In light of the uncertainties attending the outlook for inflation, the Committee agreed that it should continue to monitor inflation developments closely.

In their discussion of language for the postmeeting statement, the Committee agreed that the data received over the intermeeting period suggested that economic growth had moderated somewhat. One factor behind that moderation was a slowdown in the growth of exports, and members decided that the statement should explicitly note that factor. In addition, data received over the intermeeting period indicated that inflation had declined, as the Committee had anticipated, and members agreed to update the statement to reflect their judgment that inflation was likely to remain near its recent low level in the near term. Members also judged that it was appropriate to note that market-based measures of inflation compensation remained near levels registered at the time of the January FOMC meeting.

The Committee agreed to maintain the target range for the federal funds rate at 0 to ¼ percent and to reaffirm in the statement that the Committee's decision about how long to maintain the current target range for the federal funds rate would depend on its assessment of actual and expected progress toward its objectives of maximum employment and 2 percent inflation. Members continued to judge that this assessment of progress would take into account a wide range of information, including measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial and international developments. In light of the considerable progress to date toward the Committee's maximum-employment objective and the implications of that progress for the outlook for inflation, members agreed to remove from the forward guidance in the postmeeting statement the indication that the Committee judges that it can be patient in beginning to normalize the stance of monetary policy and to indicate instead that the Committee anticipates that it will be appropriate to raise the target range for the federal funds rate when it has seen further improvement in the labor market and is reasonably confident that inflation will move back to its 2 percent objective over the medium term. Members viewed the new guidance as consistent with the outlook for policy that the Committee had expressed in January, and they agreed that the postmeeting statement should note that an increase in the target range for the federal funds rate remained unlikely at the April FOMC meeting; in addition, they generally saw the new language as providing the Committee with the flexibility to begin raising the target range for the federal funds rate in June or at a subsequent meeting. Members noted that the timing of the first increase would depend on the evolution of economic conditions and the outlook, and that the change in the forward guidance was not intended to indicate that the Committee had decided on the timing of the initial increase in the target range for the federal funds rate.

The Committee also decided to maintain its policy of reinvesting principal payments from agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury

securities at auction. This policy, by keeping the Committee's holdings of longer-term securities at sizable levels, should help maintain accommodative financial conditions. The Committee agreed to reiterate its expectation that, even after employment and inflation are near mandate-consistent levels, economic conditions may, for some time, warrant keeping the target federal funds rate below levels the Committee views as normal in the longer run.

At the conclusion of the discussion, the Committee voted to authorize and direct the Federal Reserve Bank of New York, until it was instructed otherwise, to execute transactions in the SOMA in accordance with the following domestic policy directive:

> "Consistent with its statutory mandate, the Federal Open Market Committee seeks monetary and financial conditions that will foster maximum employment and price stability. In particular, the Committee seeks conditions in reserve markets consistent with federal funds trading in a range from 0 to ¼ percent. The Committee directs the Desk to undertake open market operations as necessary to maintain such conditions. The Committee directs the Desk to maintain its policy of rolling over maturing Treasury securities into new issues and its policy of reinvesting principal payments on all agency debt and agency mortgage-backed securities in agency mortgage-backed securities. The Committee also directs the Desk to engage in dollar roll and coupon swap transactions as necessary to facilitate settlement of the Federal Reserve's agency mortgage-backed securities transactions. The System Open Market Account manager and the secretary will keep the Committee informed of ongoing developments regarding the System's balance sheet that could affect the attainment over time of the Committee's objectives of maximum employment and price stability."

The vote encompassed approval of the statement below to be released at 2:00 p.m.:

> "Information received since the Federal Open Market Committee met in January suggests that economic growth has moderated somewhat. Labor market conditions have improved further, with strong job gains and a lower unemployment rate. A range of labor market indicators suggests that underutilization of labor resources continues to diminish. Household spending is rising moderately; declines in energy prices have boosted household purchasing power. Business fixed investment is advancing, while the recovery in the housing sector remains slow and export growth has weakened. Inflation has declined further below the Committee's longer-run objective, largely reflecting declines in energy prices. Market-based measures of inflation compensation remain low; survey-based measures of longer-term inflation expectations have remained stable.
>
> Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee expects that, with appropriate policy accommodation, economic activity will expand at a moderate pace, with labor market indicators continuing to move toward levels the Committee judges consistent with its dual mandate. The Committee continues to see the risks to the outlook for economic activity and the labor market as nearly balanced. Inflation is anticipated to remain near its recent low level in the near term, but the Committee expects inflation to rise gradually toward 2 percent over the medium term as the labor market improves further and the transitory effects of energy price declines and other factors dissipate. The Committee continues to monitor inflation developments closely.
>
> To support continued progress toward maximum employment and price stability, the Committee today reaffirmed its view that the current 0 to ¼ percent target range for the federal funds rate remains appropriate. In determining how long to maintain this target range, the Committee will assess progress—both realized and expected—toward its objectives of maximum employment and 2 percent inflation. This assessment will take into account a wide range of information, including measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial and international developments. Consistent with its previous statement, the Committee judges that an increase in the target range for the federal funds rate remains unlikely at the April FOMC meeting. The Committee anticipates that it will be appropriate to raise the target range for the federal funds rate when it has seen further improvement in the labor market and is reasonably confident that inflation will move

back to its 2 percent objective over the medium term. This change in the forward guidance does not indicate that the Committee has decided on the timing of the initial increase in the target range.

The Committee is maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at auction. This policy, by keeping the Committee's holdings of longer-term securities at sizable levels, should help maintain accommodative financial conditions.

When the Committee decides to begin to remove policy accommodation, it will take a balanced approach consistent with its longer-run goals of maximum employment and inflation of 2 percent. The Committee currently anticipates that, even after employment and inflation are near mandate-consistent levels, economic conditions may, for some time, warrant keeping the target federal funds rate below levels the Committee views as normal in the longer run."

Voting for this action: Janet L. Yellen, William C. Dudley, Lael Brainard, Charles L. Evans, Stanley Fischer, Jeffrey M. Lacker, Dennis P. Lockhart, Jerome H. Powell, Daniel K. Tarullo, and John C. Williams.

Voting against this action: None.

It was agreed that the next meeting of the Committee would be held on Tuesday–Wednesday, April 28–29, 2015. The meeting adjourned at 10:45 a.m. on March 18, 2015.

Notation Vote

By notation vote completed on February 17, 2015, the Committee unanimously approved the minutes of the Committee meeting held on January 27–28, 2015.

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Thomas Laubach
Secretary

Summary of Economic Projections

In conjunction with the Federal Open Market Committee (FOMC) meeting held on March 17–18, 2015, meeting participants submitted their projections of the most likely outcomes for real output growth, the unemployment rate, inflation, and the federal funds rate for each year from 2015 to 2017 and over the longer run.[1] Each participant's projection was based on information available at the time of the meeting plus his or her assessment of appropriate monetary policy and assumptions about the factors likely to affect economic outcomes. The longer-run projections represent each participant's assessment of the value to which each variable would be expected to converge, over time, under appropriate monetary policy and in the absence of further shocks to the economy. "Appropriate monetary policy" is defined as the future path of policy that each participant deems most likely to foster outcomes for economic activity and inflation that best satisfy his or her individual interpretation of the Federal Reserve's objectives of maximum employment and stable prices.

[1] The president of the Federal Reserve Bank of Dallas did not participate in this FOMC meeting, and the incoming president of the Federal Reserve Bank of Philadelphia is scheduled to assume office on July 1. Helen E. Holcomb and Blake Prichard, First Vice Presidents of the Federal Reserve Banks of Dallas and Philadelphia, respectively, submitted economic projections.

All FOMC participants but one expected that economic growth under appropriate policy would be somewhat faster in 2015 and in 2016 than their individual estimates of the U.S. economy's longer-run normal growth rate and at or near its longer-run rate in 2017 (table 1 and figure 1). Most participants projected that the unemployment rate would continue to decline in 2015 and 2016, and all participants projected that the unemployment rate would be at or below their individual judgments of its longer-run normal level by the end of 2017. Participants saw inflation, as measured by the four-quarter change in the price index for personal consumption expenditures (PCE), slowing this year but picking up notably next year; almost all of the participants projected that inflation would be at or close to the Committee's 2 percent longer-run objective in 2017.

As shown in figure 2, all but two participants anticipated that it would be appropriate to begin raising the target range for the federal funds rate in 2015. Most expected that it would be appropriate to raise the target federal funds rate fairly gradually over the projection period as labor market conditions and inflation move toward values the Committee judges consistent with the attainment of its mandated objectives of maximum employment and stable prices. Most participants continued to expect that it would be appropriate for the federal funds rate to stay appreciably below its longer-run level after inflation and unemployment are near mandate-consistent levels,

Table 1. Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents, March 2015*
Percent

Variable	Central tendency[1]				Range[2]			
	2015	2016	2017	Longer run	2015	2016	2017	Longer run
Change in real GDP	2.3 to 2.7	2.3 to 2.7	2.0 to 2.4	2.0 to 2.3	2.1 to 3.1	2.2 to 3.0	1.8 to 2.5	1.8 to 2.5
December projection	2.6 to 3.0	2.5 to 3.0	2.3 to 2.5	2.0 to 2.3	2.1 to 3.2	2.1 to 3.0	2.0 to 2.7	1.8 to 2.7
Unemployment rate	5.0 to 5.2	4.9 to 5.1	4.8 to 5.1	5.0 to 5.2	4.8 to 5.3	4.5 to 5.2	4.8 to 5.5	4.9 to 5.8
December projection	5.2 to 5.3	5.0 to 5.2	4.9 to 5.3	5.2 to 5.5	5.0 to 5.5	4.9 to 5.4	4.7 to 5.7	5.0 to 5.8
PCE inflation	0.6 to 0.8	1.7 to 1.9	1.9 to 2.0	2.0	0.6 to 1.5	1.6 to 2.4	1.7 to 2.2	2.0
December projection	1.0 to 1.6	1.7 to 2.0	1.8 to 2.0	2.0	1.0 to 2.2	1.6 to 2.1	1.8 to 2.2	2.0
Core PCE inflation[3]	1.3 to 1.4	1.5 to 1.9	1.8 to 2.0		1.2 to 1.6	1.5 to 2.4	1.7 to 2.2	
December projection	1.5 to 1.8	1.7 to 2.0	1.8 to 2.0		1.5 to 2.2	1.6 to 2.1	1.8 to 2.2	

NOTE: Projections of change in real gross domestic product (GDP) and projections for both measures of inflation are from the fourth quarter of the previous year to the fourth quarter of the year indicated. PCE inflation and core PCE inflation are the percentage rates of change in, respectively, the price index for personal consumption expenditures (PCE) and the price index for PCE excluding food and energy. Projections for the unemployment rate are for the average civilian unemployment rate in the fourth quarter of the year indicated. Each participant's projections are based on his or her assessment of appropriate monetary policy. Longer-run projections represent each participant's assessment of the rate to which each variable would be expected to converge under appropriate monetary policy and in the absence of further shocks to the economy. The December projections were made in conjunction with the meeting of the Federal Open Market Committee on December 16–17, 2014.

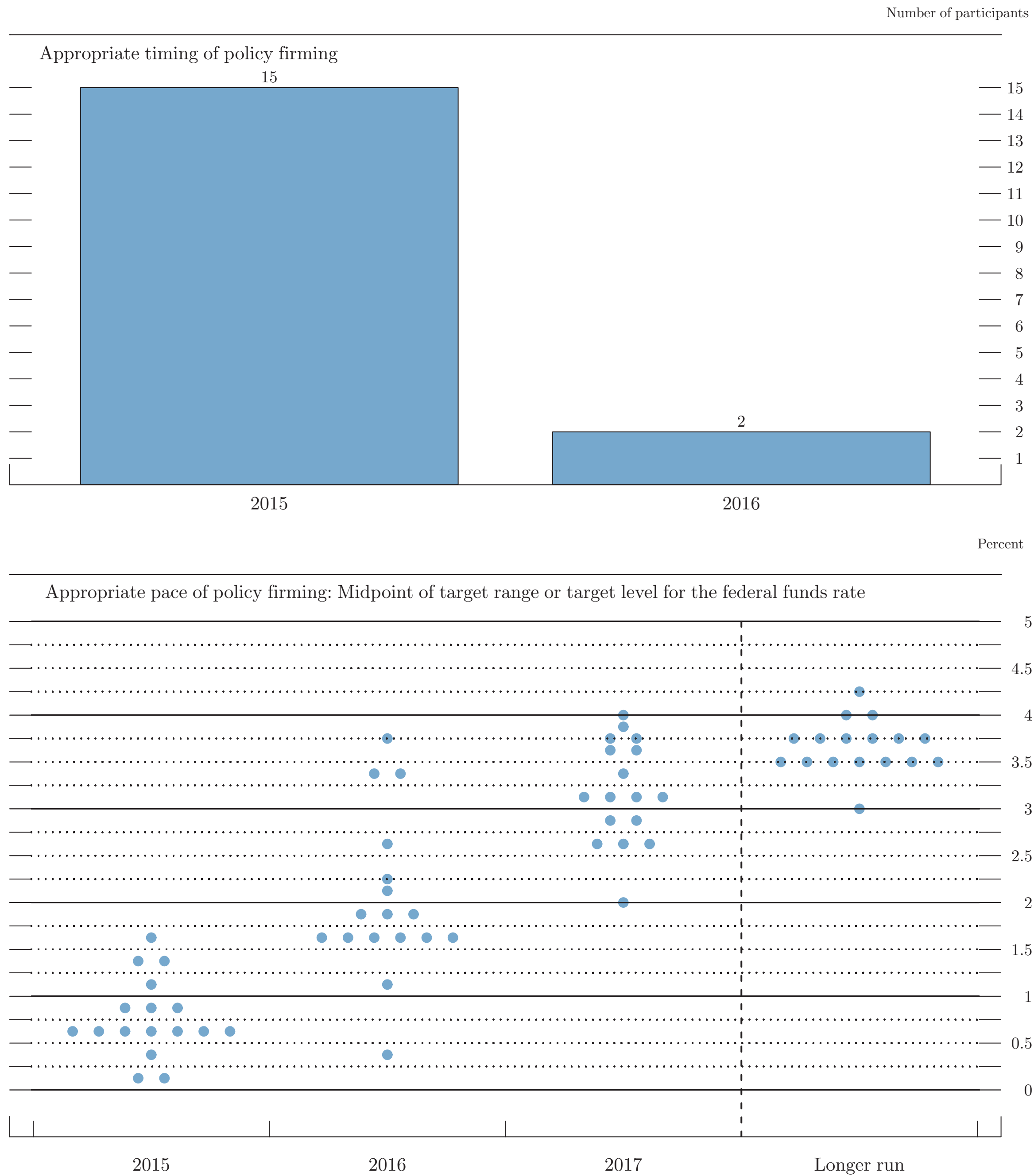
1. The central tendency excludes the three highest and three lowest projections for each variable in each year.
2. The range for a variable in a given year includes all participants' projections, from lowest to highest, for that variable in that year.
3. Longer-run projections for core PCE inflation are not collected.

* The lower end of the central tendency for longer-run unemployment from the December projections was corrected on April 8, 2015. The error only affected the PDF version of the March Summary of Economic Projections.

Figure 1. Central tendencies and ranges of economic projections, 2015–17 and over the longer run

Note: Definitions of variables are in the general note to table 1. The data for the actual values of the variables are annual.

Figure 2. Overview of FOMC participants' assessments of appropriate monetary policy



NOTE: In the upper panel, the height of each bar denotes the number of FOMC participants who judge that, under appropriate monetary policy, the first increase in the target range for the federal funds rate from its current range of 0 to 1/4 percent will occur in the specified calendar year. In December 2014, the numbers of FOMC participants who judged that the first increase in the target federal funds rate would occur in 2015, and 2016 were, respectively, 15, and 2. In the lower panel, each shaded circle indicates the value (rounded to the nearest 1/8 percentage point) of an individual participant's judgment of the midpoint of the appropriate target range for the federal funds rate or the appropriate target level for the federal funds rate at the end of the specified calendar year or over the longer run.

reflecting the effects of remaining headwinds holding back the recovery, along with other factors.

Most participants viewed the uncertainty associated with their outlooks for economic growth and the unemployment rate as broadly similar to the average level of the past 20 years. Most participants also judged the level of uncertainty about inflation to be broadly similar to the average level of the past 20 years, although several participants viewed it as higher. In addition, most participants continued to see the risks to the outlook for economic growth and for the unemployment rate as broadly balanced, though some viewed the risks to economic growth as weighted to the downside. Equal numbers of participants saw the risks to inflation as balanced or as weighted to the downside, while one judged these risks as tilted to the upside.

The Outlook for Economic Activity

Participants generally projected that, conditional on their individual assumptions about appropriate monetary policy, real gross domestic product (GDP) would grow in 2015 and 2016 at a pace somewhat faster than their estimates of its longer-run normal rate and at or near its longer-run rate in 2017. Participants pointed to a number of factors that they expected would contribute to solid real output growth over the next few years, including improving labor market conditions, strengthened household and business balance sheets, the boost to consumer spending from low energy prices, diminishing restraint from fiscal policy, and still-accommodative monetary policy.

Compared with their Summary of Economic Projections (SEP) contributions in December, all but a couple of participants revised down their projections of real GDP growth over the forecast period. A number of participants cited the further appreciation of the dollar and recent weakness in spending and production data as reasons for their revision. The central tendencies of participants' current projections for real GDP growth were 2.3 to 2.7 percent in 2015 and in 2016, and 2.0 to 2.4 percent in 2017. The central tendency of the projections of real GDP growth over the longer run was 2.0 to 2.3 percent, unchanged from December.

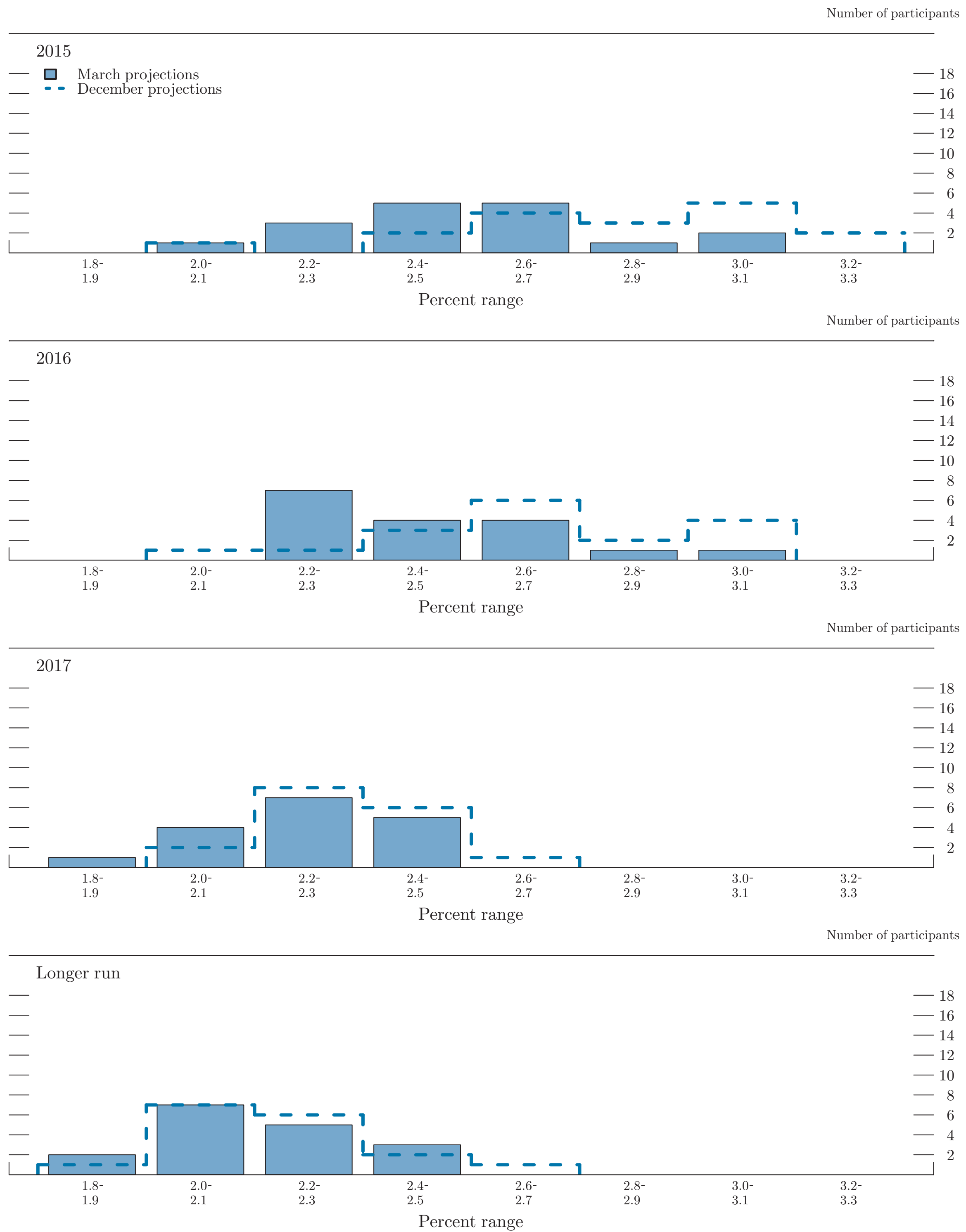
Most participants projected that the unemployment rate would continue to decline through 2016, and all projected that by the fourth quarter of 2017 the unemployment rate would be at or below their individual judgments of its longer-run normal level. The central tendencies of participants' forecasts for the unemployment rate in the fourth quarter of each year were 5.0 to 5.2 percent in 2015, 4.9 to 5.1 percent in 2016, and 4.8 to 5.1 percent in 2017. Compared with the December SEP, participants' projected paths for the unemployment rate generally shifted down slightly through 2017. Many participants noted that recent data pointing to faster-than-expected improvement in labor market conditions were an important factor underlying the downward revisions to their unemployment rate forecasts. More than half of the participants revised down their estimates of the longer-run normal rate of unemployment; as a result, the central tendency of these estimates shifted down to 5.0 to 5.2 percent. Several participants noted that still-subdued wage and price inflation despite the stronger-than-expected momentum in the labor market suggested a lower level of the longer-run normal unemployment rate than they had thought previously, and a couple mentioned research indicating that demographic groups with lower average unemployment rates have accounted for an increasing fraction of the labor force.

Figures 3.A and 3.B show the distribution of participants' views regarding the likely outcomes for real GDP growth and the unemployment rate through 2017. Some of the diversity of views reflected participants' individual assessments of the effects of lower oil prices on consumer spending and business investment, of the extent to which dollar appreciation would affect real activity, of the rate at which the forces that have been restraining the pace of the economic recovery would continue to abate, of the trajectory for growth in consumption as labor market slack diminishes, and of the appropriate path of monetary policy. Relative to the December SEP, the dispersion of participants' projections for real GDP growth was a bit narrower from 2015 through 2017, while for the unemployment rate, the dispersion was roughly unchanged.

The Outlook for Inflation

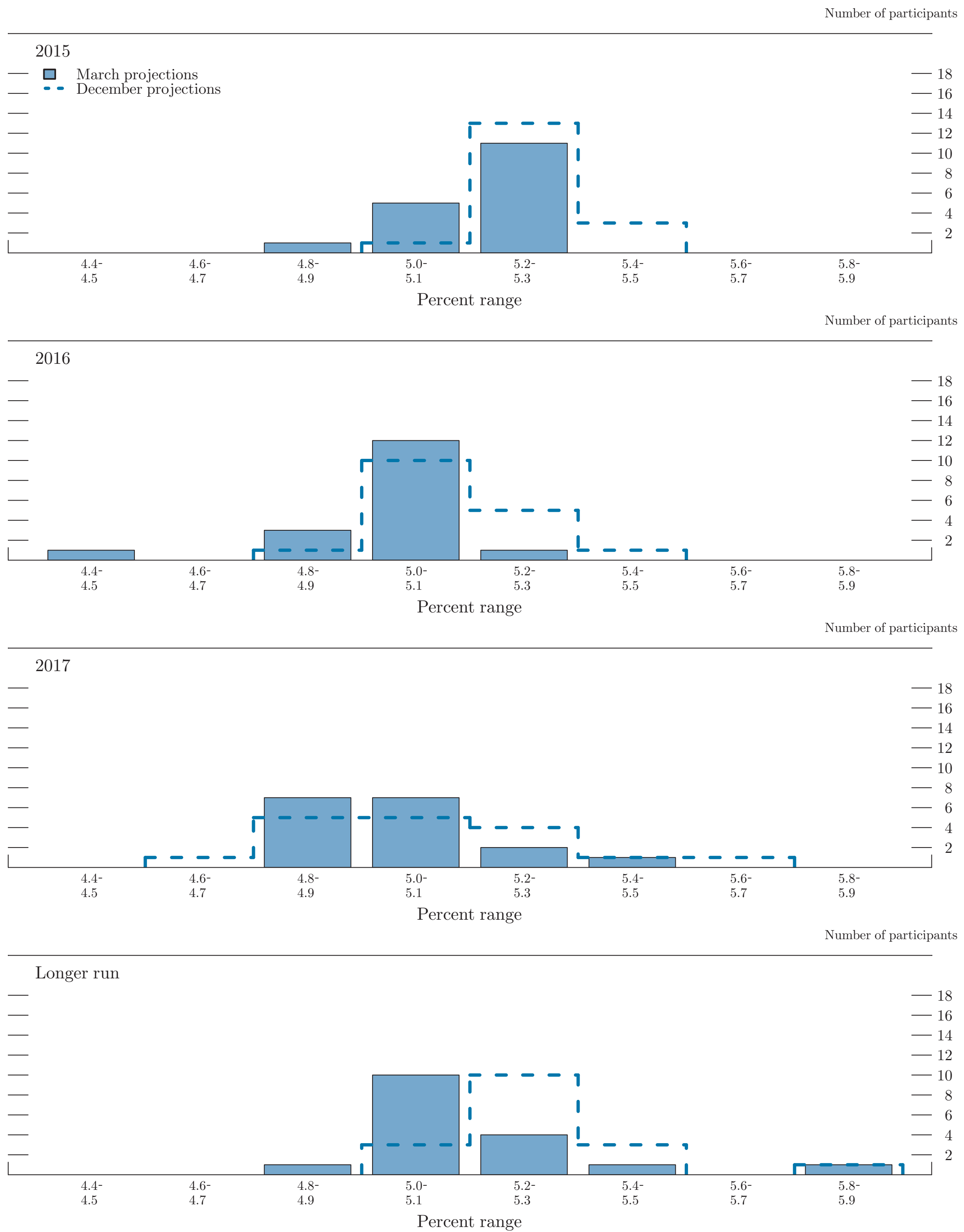
Compared with the December SEP, all participants marked down their projections for PCE inflation this year, noting that inflation had been running below their earlier projections and that significant declines in energy prices and import prices were putting temporary downward pressure on inflation. All participants saw PCE inflation picking up in 2016, and almost all saw inflation at or close to the Committee's 2 percent longer-run objective in 2017. All of the participants also marked down their projections for core PCE inflation this year, and nearly half revised down their projections for core PCE inflation in 2016 by 0.2 percentage point or more, with many noting that core inflation had run below their earlier projections in recent months and several citing declines in non-oil import prices and pass-through of de-

Figure 3.A. Distribution of participants' projections for the change in real GDP, 2015–17 and over the longer run



Note: Definitions of variables are in the general note to table 1.

Figure 3.B. Distribution of participants' projections for the unemployment rate, 2015–17 and over the longer run



NOTE: Definitions of variables are in the general note to table 1.

clines in energy prices. Almost all expected core inflation to rise gradually over the projection period and to reach a level at or near 2 percent in 2017. The central tendencies for PCE inflation were 0.6 to 0.8 percent in 2015, 1.7 to 1.9 percent in 2016, and 1.9 to 2.0 percent in 2017, and the central tendencies for core PCE inflation were 1.3 to 1.4 percent in 2015, 1.5 to 1.9 percent in 2016, and 1.8 to 2.0 percent in 2017. Factors cited by participants as likely to contribute to a rise of inflation toward 2 percent included stable longer-term inflation expectations, steadily diminishing resource slack, a pickup in wage growth, the waning effects of declines in energy prices, and still-accommodative monetary policy.

Figures 3.C and 3.D provide information on the distribution of participants' views about the outlook for inflation. The range of participants' projections for PCE inflation in 2015 narrowed somewhat compared with December. The range for PCE inflation in 2016 widened slightly, likely reflecting in part differences in participants' assessments of the effects of the declines in energy and import prices on the outlook for inflation. Similarly, the ranges for core PCE inflation narrowed in 2015 and widened slightly in 2016. The range for both measures in 2017 was relatively little changed and continued to show a very substantial concentration near the Committee's 2 percent longer-run objective by that time.

Appropriate Monetary Policy

Participants judged that it would be appropriate to raise the target range for the federal funds rate over the projection period as labor market conditions and inflation move toward values the Committee judges consistent with the attainment of its mandated objectives of maximum employment and price stability. As shown in figure 2, all but two participants anticipated that it would be appropriate to begin raising the target range for the federal funds rate during 2015. However, a large majority projected that the appropriate level of the federal funds rate would remain below their individual estimates of its longer-run normal level through 2017.

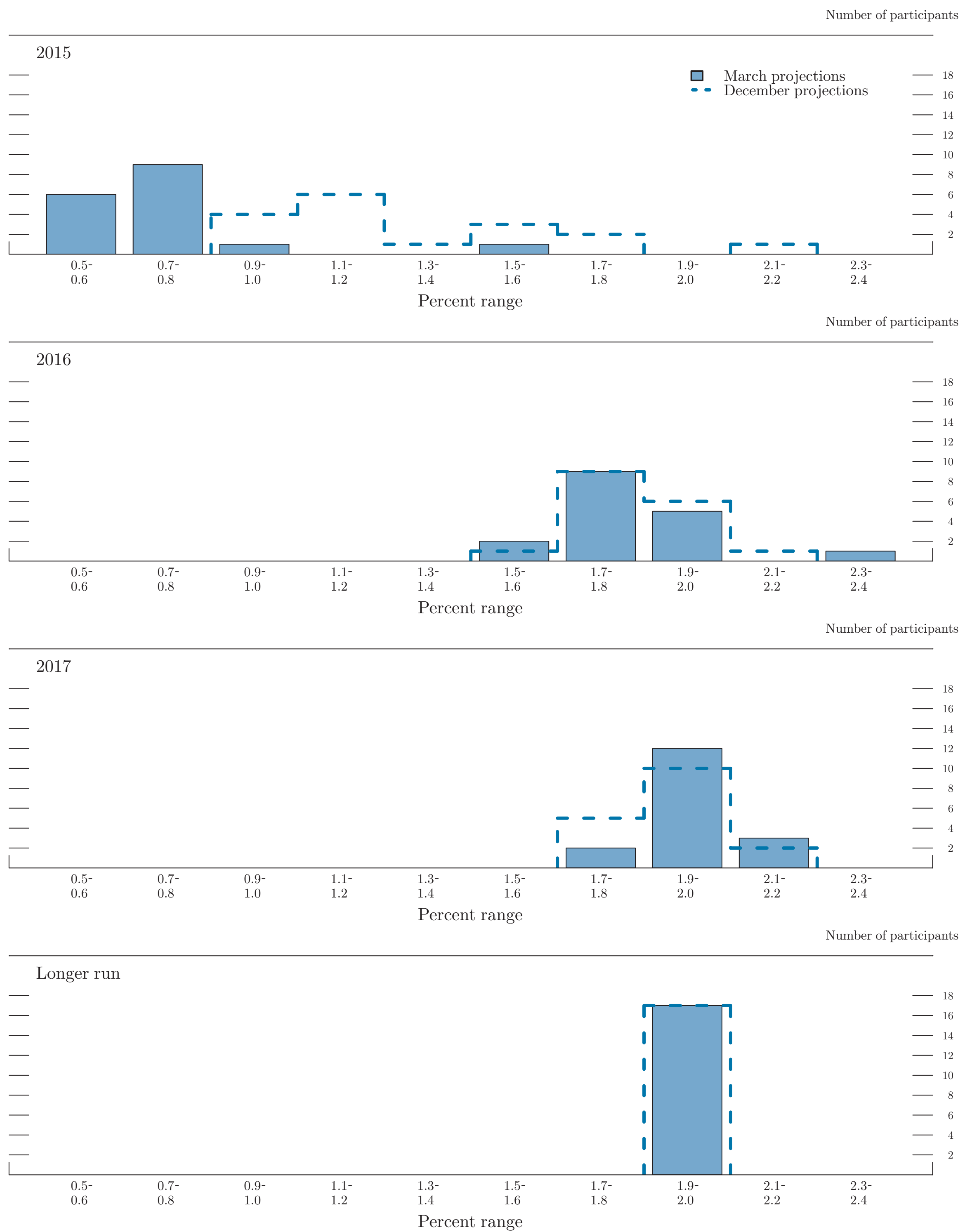
Most participants projected that the unemployment rate would be at or somewhat above their estimates of its longer-run normal level at the end of the year in which they judged the initial increase in the target range for the federal funds rate would be warranted. Almost all participants projected that inflation would be below the Committee's 2 percent objective that year, but they also saw inflation rising substantially closer to 2 percent in the following year.

Figure 3.E provides the distribution of participants' judgments regarding the appropriate level of the target federal funds rate at the end of each calendar year from 2015 to 2017 and over the longer run. The median values of the federal funds rate at the end of 2015, 2016, and 2017 decreased 50, 62, and 50 basis points, respectively, relative to December, to 0.63, 1.88, and 3.13 percent, while the mean values for those years declined 35, 52, and 32 basis points, respectively, to 0.78, 2.03, and 3.19 percent. Compared with December, the dispersion of the projections for the appropriate level of the federal funds rate was a bit narrower over the projection period.

Most participants judged that it would be appropriate for the federal funds rate in 2017 to remain below its longer-run normal level, with nearly half of them projecting the federal funds rate in 2017 to be more than ½ percentage point lower than their estimates of its longer-run value. Participants provided a number of reasons why they thought it would be appropriate for the federal funds rate to remain below its longer-run normal level for some time after inflation and the unemployment rate were near mandate-consistent levels. These reasons included an assessment that the headwinds that have been holding back the recovery will continue to exert some restraint on economic activity at that time, that weak real activity abroad and the recent appreciation of the dollar are likely to continue to restrain U.S. net exports for some time, that residual slack in the labor market will still be evident in measures of labor utilization other than the unemployment rate, and that the risks to the economic outlook are asymmetric as a result of the constraints on monetary policy associated with the effective lower bound on the federal funds rate.

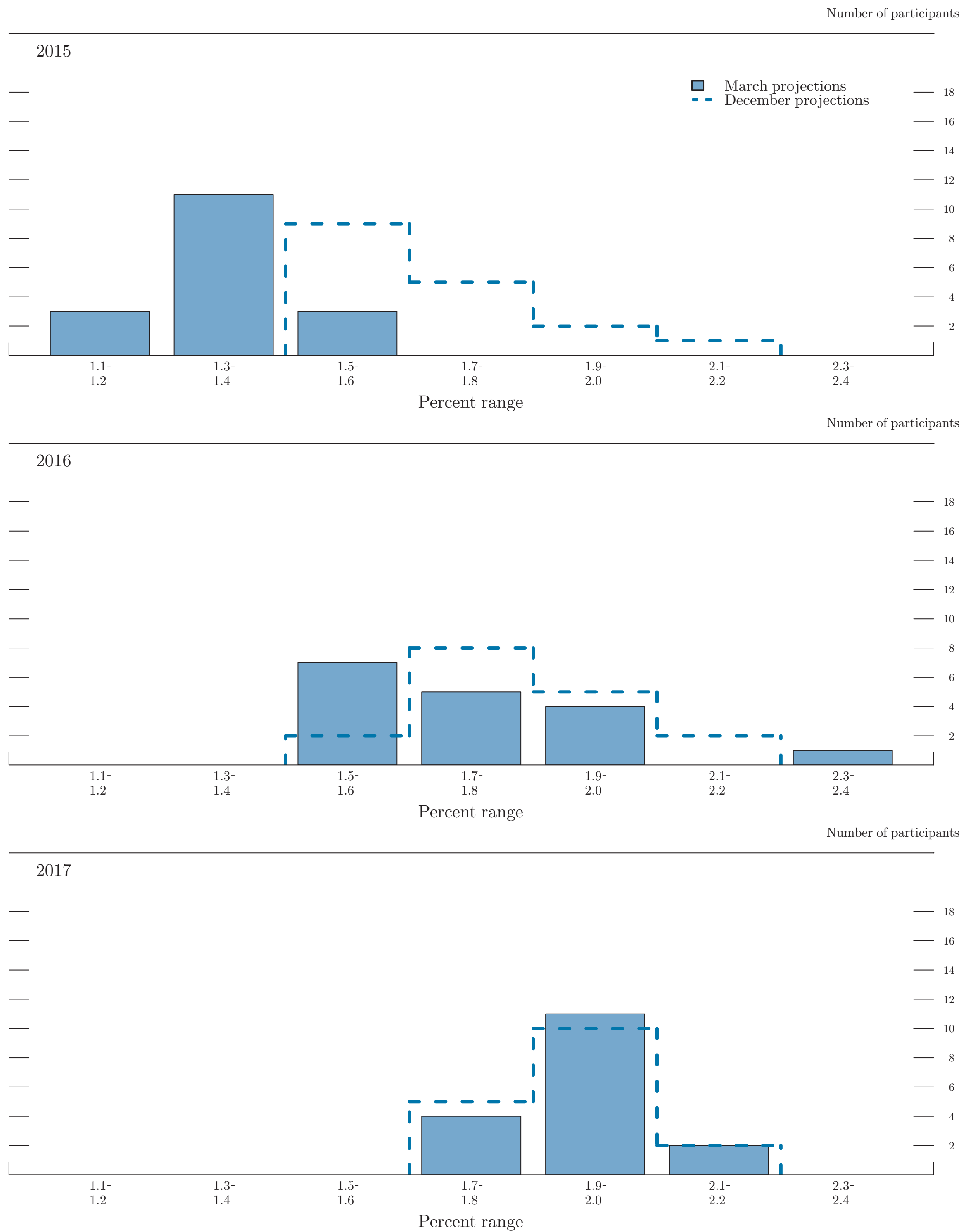
Relative to the December SEP, almost half of the participants revised down their estimates of the longer-run level of the federal funds rate, typically by ¼ percentage point, with a lower assessment of the economy's longer-run potential growth rate generally cited as a contributing factor for those revisions. Though the median estimate of the longer-run normal federal funds rate was unchanged from December, the central tendency narrowed to 3.5 to 3.75 percent from 3.5 to 4.0 percent in December, and the range moved down a bit to 3.0 to 4.25 percent from 3.25 to 4.25 percent in December. All participants judged that inflation in the longer run would be equal to the Committee's inflation objective of 2 percent, implying that their individual judgments regarding the appropriate longer-run level of the real federal funds rate in the absence of further shocks to the economy ranged from 1.0 to 2.25 percent.

Figure 3.C. Distribution of participants' projections for PCE inflation, 2015–17 and over the longer run



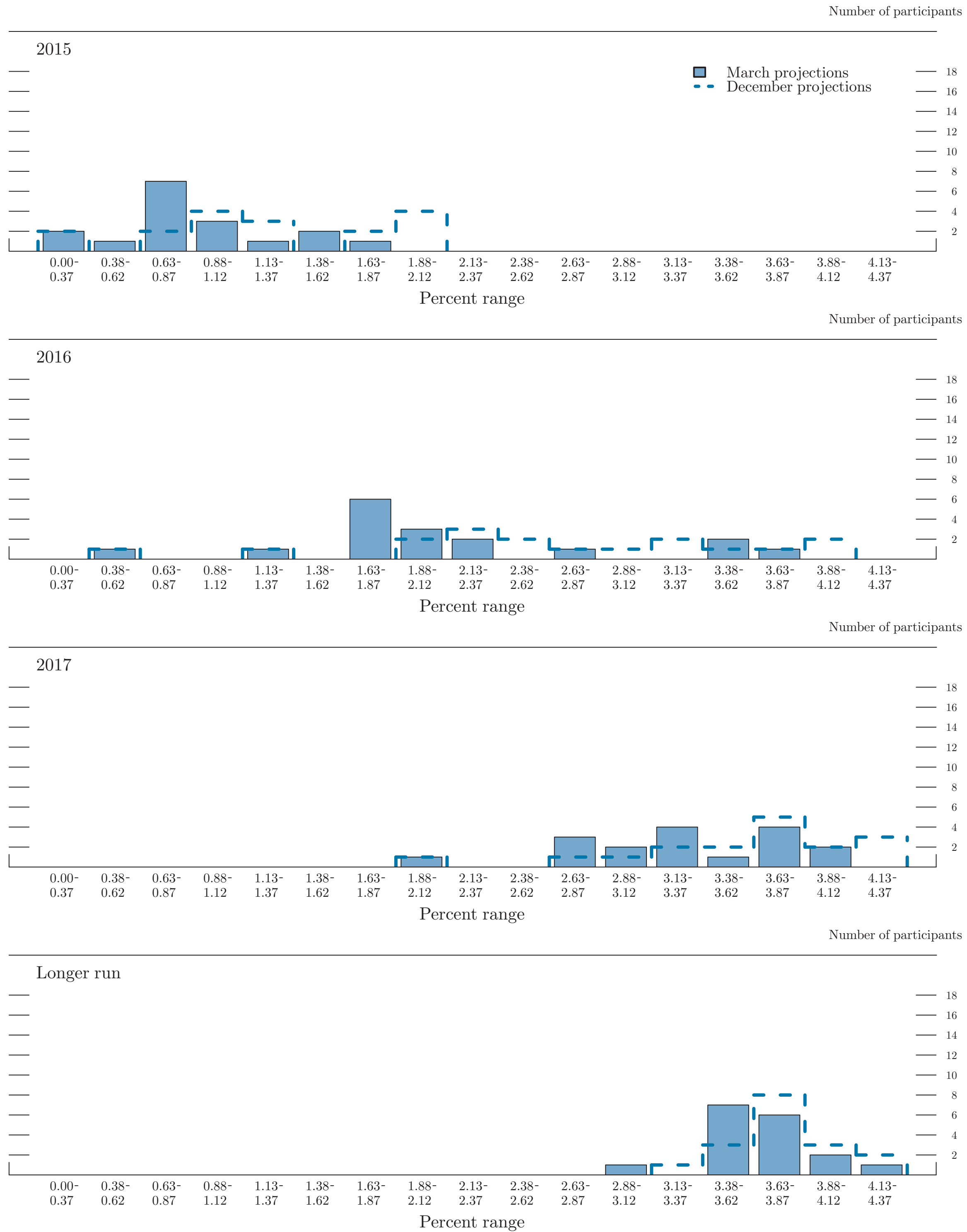
Note: Definitions of variables are in the general note to table 1.

Figure 3.D. Distribution of participants' projections for core PCE inflation, 2015–17



NOTE: Definitions of variables are in the general note to table 1.

Figure 3.E. Distribution of participants' judgments of the midpoint of the appropriate target range for the federal funds rate or the appropriate target level for the federal funds rate, 2015–17 and over the longer run



NOTE: The midpoints of the target ranges for the federal funds rate and the target levels for the federal funds rate are measured at the end of the specified calendar year or over the longer run.

Table 2. Average historical projection error ranges

Percentage points

Variable	2015	2016	2017
Change in real GDP[1]	±1.6	±2.1	±2.0
Unemployment rate[1]	±0.5	±1.2	±1.7
Total consumer prices[2]	±0.9	±1.0	±1.0

NOTE: Error ranges shown are measured as plus or minus the root mean squared error of projections for 1995 through 2014 that were released in the winter by various private and government forecasters. As described in the box "Forecast Uncertainty," under certain assumptions, there is about a 70 percent probability that actual outcomes for real GDP, unemployment, and consumer prices will be in ranges implied by the average size of projection errors made in the past. For more information, see David Reifschneider and Peter Tulip (2007), "Gauging the Uncertainty of the Economic Outlook from Historical Forecasting Errors," Finance and Economics Discussion Series 2007-60 (Washington: Board of Governors of the Federal Reserve System, November), available at www.federalreserve.gov/pubs/feds/ 2007/200760/200760abs.html; and Board of Governors of the Federal Reserve System, Division of Research and Statistics (2014), "Updated Historical Forecast Errors," memorandum, April 9, www.federalreserve.gov/foia/files/20140409-historical-forecast-errors.pdf.

1. Definitions of variables are in the general note to table 1.

2. Measure is the overall consumer price index, the price measure that has been most widely used in government and private economic forecasts. Projection is percent change, fourth quarter of the previous year to the fourth quarter of the year indicated.

Participants' views of the appropriate path for monetary policy were informed by their judgments about the state of the economy, including the values of the unemployment rate and other labor market indicators that would be consistent with maximum employment, the extent to which the economy was currently falling short of maximum employment, the prospects for inflation to return to the Committee's longer-term objective of 2 percent, the implications of international developments for the domestic economy, the desire to minimize potential disruptions in financial markets, and the balance of risks around the outlook. Some participants also mentioned the prescriptions of various monetary policy rules as factors they considered in judging the appropriate path for the federal funds rate.

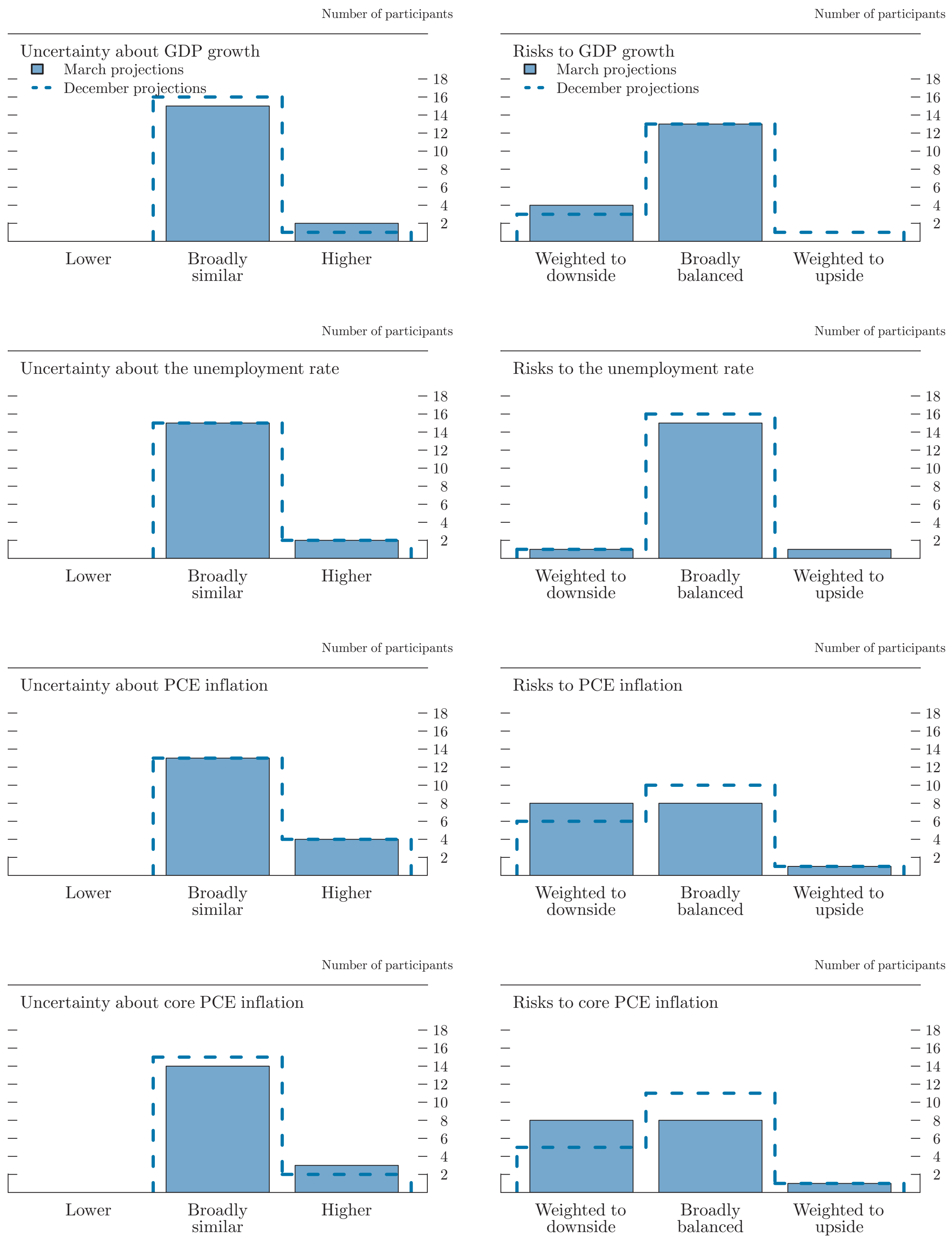
Uncertainty and Risks

Nearly all participants continued to judge the levels of uncertainty attending their projections for real GDP growth and the unemployment rate as broadly similar to the norms during the previous 20 years (figure 4).[2] Most participants continued to see the risks to their outlooks for real GDP growth as broadly balanced, though some participants viewed the risks to real GDP growth as weighted to the downside. Those participants who viewed the risks as weighted to the downside cited, for example, concern about the limited ability of monetary policy at the effective lower bound to respond to further negative shocks to the economy or about the trajectory for economic growth abroad. Nearly all participants again judged the risks to the outlook for the unemployment rate to be broadly balanced.

As in the December SEP, participants generally agreed that the levels of uncertainty associated with their inflation forecasts were broadly similar to historical norms. Almost half of participants viewed the risks to their inflation forecast as balanced. However, the risks were seen as tilted to the downside by an equal number of participants, an increase since the December SEP. These participants cited the possibility that the recent low levels of inflation could prove more persistent than anticipated or that the upward pressure on prices from inflation expectations might be weaker than assumed, or the judgment that, in current circumstances, it would be difficult for the Committee to respond effectively to low-inflation outcomes. Conversely, one participant saw upside risks to inflation, citing uncertainty about the timing and efficacy of the Committee's withdrawal of monetary policy accommodation.

[2] Table 2 provides estimates of the forecast uncertainty for the change in real GDP, the unemployment rate, and total consumer price inflation over the period from 1995 through 2014. At the end of this summary, the box "Forecast Uncertainty" discusses the sources and interpretation of uncertainty in the economic forecasts and explains the approach used to assess the uncertainty and risks attending the participants' projections.

Figure 4. Uncertainty and risks in economic projections



NOTE: For definitions of uncertainty and risks in economic projections, see the box "Forecast Uncertainty." Definitions of variables are in the general note to table 1.

Forecast Uncertainty

The economic projections provided by the members of the Board of Governors and the presidents of the Federal Reserve Banks inform discussions of monetary policy among policymakers and can aid public understanding of the basis for policy actions. Considerable uncertainty attends these projections, however. The economic and statistical models and relationships used to help produce economic forecasts are necessarily imperfect descriptions of the real world, and the future path of the economy can be affected by myriad unforeseen developments and events. Thus, in setting the stance of monetary policy, participants consider not only what appears to be the most likely economic outcome as embodied in their projections, but also the range of alternative possibilities, the likelihood of their occurring, and the potential costs to the economy should they occur.

Table 2 summarizes the average historical accuracy of a range of forecasts, including those reported in past *Monetary Policy Reports* and those prepared by the Federal Reserve Board's staff in advance of meetings of the Federal Open Market Committee. The projection error ranges shown in the table illustrate the considerable uncertainty associated with economic forecasts. For example, suppose a participant projects that real gross domestic product (GDP) and total consumer prices will rise steadily at annual rates of, respectively, 3 percent and 2 percent. If the uncertainty attending those projections is similar to that experienced in the past and the risks around the projections are broadly balanced, the numbers reported in table 2 would imply a probability of about 70 percent that actual GDP would expand within a range of 1.4 to 4.6 percent in the current year, 0.9 to 5.1 percent in the second year, and 1.0 to 5.0 percent in the third year. The corresponding 70 percent confidence intervals for overall inflation would be 1.1 to 2.9 percent in the current year and 1.0 to 3.0 percent in the second and third years.

Because current conditions may differ from those that prevailed, on average, over history, participants provide judgments as to whether the uncertainty attached to their projections of each variable is greater than, smaller than, or broadly similar to typical levels of forecast uncertainty in the past, as shown in table 2. Participants also provide judgments as to whether the risks to their projections are weighted to the upside, are weighted to the downside, or are broadly balanced. That is, participants judge whether each variable is more likely to be above or below their projections of the most likely outcome. These judgments about the uncertainty and the risks attending each participant's projections are distinct from the diversity of participants' views about the most likely outcomes. Forecast uncertainty is concerned with the risks associated with a particular projection rather than with divergences across a number of different projections.

As with real activity and inflation, the outlook for the future path of the federal funds rate is subject to considerable uncertainty. This uncertainty arises primarily because each participant's assessment of the appropriate stance of monetary policy depends importantly on the evolution of real activity and inflation over time. If economic conditions evolve in an unexpected manner, then assessments of the appropriate setting of the federal funds rate would change from that point forward.