Minutes of the Federal Open Market Committee
December 18–19, 2018

A joint meeting of the Federal Open Market Committee and the Board of Governors was held in the offices of the Board of Governors of the Federal Reserve System in Washington, D.C., on Tuesday, December 18, 2018, at 1:00 p.m. and continued on Wednesday, December 19, 2018, at 9:00 a.m.[1]

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

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

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

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

David Altig, Kartik B. Athreya, Thomas A. Connors, David E. Lebow, Trevor A. Reeve, William Wascher, and Beth Anne Wilson, Associate Economists

Simon Potter, Manager, System Open Market Account

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

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

Matthew J. Eichner,[2] Director, Division of Reserve Bank Operations and Payment Systems, Board of Governors; Michael S. Gibson, Director, Division of Supervision and Regulation, Board of Governors; Andreas Lehnert, Director, Division of Financial Stability, Board of Governors

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

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

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

Brian M. Doyle, Joseph W. Gruber, Ellen E. Meade, and John M. Roberts, Special Advisers to the Board, Office of Board Members, Board of Governors

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

Shaghil Ahmed and Christopher J. Erceg, Senior Associate Directors, Division of International Finance, Board of Governors; Eric M. Engen, Senior Associate Director, Division of Research and Statistics, Board of Governors; Gretchen C. Weinbach,[3] Senior Associate Director, Division of Monetary Affairs, Board of Governors

[1] The Federal Open Market Committee is referenced as the "FOMC" and the "Committee" in these minutes.
[2] Attended through the discussion of developments in financial markets and open market operations.

Edward Nelson, Senior Adviser, Division of Monetary Affairs, Board of Governors

Marnie Gillis DeBoer,[3] David López-Salido, and Min Wei, Associate Directors, Division of Monetary Affairs, Board of Governors; John J. Stevens, Associate Director, Division of Research and Statistics, Board of Governors

Steven A. Sharpe, Deputy Associate Director, Division of Research and Statistics, Board of Governors; Jeffrey D. Walker,[2] Deputy Associate Director, Division of Reserve Bank Operations and Payment Systems, Board of Governors

Andrew Figura and John Sabelhaus, Assistant Directors, Division of Research and Statistics, Board of Governors; Christopher J. Gust,[4] Laura Lipscomb,[3] and Zeynep Senyuz,[3] Assistant Directors, Division of Monetary Affairs, Board of Governors

Don Kim, Adviser, Division of Monetary Affairs, Board of Governors

Penelope A. Beattie,[5] Assistant to the Secretary, Office of the Secretary, Board of Governors

Michele Cavallo,[5] Section Chief, Division of Monetary Affairs, Board of Governors

Mark A. Carlson,[2] Senior Economic Project Manager, Division of Monetary Affairs, Board of Governors

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

Andrea Ajello and Alyssa G. Anderson,[3] Principal Economists, Division of Monetary Affairs, Board of Governors

Arsenios Skaperdas,[3] Economist, Division of Monetary Affairs, Board of Governors

Donielle A. Winford, Information Management Analyst, Division of Monetary Affairs, Board of Governors

Michael Dotsey, Sylvain Leduc, Daniel G. Sullivan, Geoffrey Tootell, and Christopher J. Waller, Executive Vice Presidents, Federal Reserve Banks of Philadelphia, San Francisco, Chicago, Boston, and St. Louis, respectively

Todd E. Clark, Evan F. Koenig, Antoine Martin, and Julie Ann Remache,[3] Senior Vice Presidents, Federal Reserve Banks of Cleveland, Dallas, New York, and New York, respectively

Roc Armenter,[3] Kathryn B. Chen,[3] Jonathan L. Willis, and Patricia Zobel,[3] Vice Presidents, Federal Reserve Banks of Philadelphia, New York, Kansas City, and New York, respectively

Gara Afonso[3] and William E. Riordan,[3] Assistant Vice Presidents, Federal Reserve Bank of New York.

Suraj Prasanna[3] and Lisa Stowe,[3] Markets Officers, Federal Reserve Bank of New York.

Samuel Schulhofer-Wohl,[2] Senior Economist and Research Advisor, Federal Reserve Bank of Chicago

Fabrizio Perri, Monetary Advisor, Federal Reserve Bank of Minneapolis

Long-Run Monetary Policy Implementation Frameworks

Committee participants resumed their discussion from the November 2018 FOMC meeting of potential long-run frameworks for monetary policy implementation. At the December meeting, the staff provided a set of briefings that considered various issues related to the transition to a long-run operating regime with lower levels of excess reserves than at present and to a long-run composition of the balance sheet.

The staff noted that during the transition to a long-run operating regime with excess reserves below current levels, the effective federal funds rate (EFFR) could begin to rise a little above the interest on excess reserves (IOER) rate as reserves in the banking system declined gradually to a level that the Committee judges to be most appropriate for efficient and effective implementation of policy. This upward movement in the federal funds rate

[3] Attended through the discussion of the long-run monetary policy implementation frameworks.

[4] Attended the discussion of financial developments and open market operations through the close of the meeting.

[5] Attended Tuesday session only.

could be gradual. However, the staff noted that the federal funds rate and other money market rates could possibly become somewhat volatile at times as banks and financial markets adjusted to lower levels of reserve balances. Were upward pressures on the federal funds rate to emerge, it could be challenging to distinguish between pressures that were transitory and likely to abate as financial institutions adjust and those that were more persistent and associated with aggregate reserve scarcity. The staff reported on the monitoring of conditions in money markets as well as various survey and market outreach activities that could assist in detecting reserve scarcity. The staff reviewed a number of steps that the Federal Reserve could take to ensure effective monetary policy implementation were upward pressures on the federal funds rate and other money market rates to emerge. These steps included lowering the IOER rate further within the target range, using the discount window to support the efficient distribution of reserves, and slowing or smoothing the pace of reserve decline through open market operations or through slowing portfolio redemptions. The staff also discussed new ceiling tools that could help keep the EFFR within the Committee's target range, including options that would add new counterparties for the Open Market Desk's operations. The staff also provided a review of the liabilities on the Federal Reserve's balance sheet; the review described the factors that influence the size of reserve and nonreserve liabilities and discussed the increase in the size of these liabilities since the financial crisis. Additionally, the staff outlined various issues related to the long-run composition of the System Open Market Account (SOMA) portfolio, including the maturity composition of the portfolio's Treasury securities and the management of residual holdings of agency mortgage-backed securities (MBS) after the Committee has normalized the size of the balance sheet.

In discussing the transition to a long-run operating regime, participants commented on the advantages and disadvantages of allowing reserves to decline to a level that could put noticeable upward pressure on the federal funds rate, at least for a time. Reducing reserves close to the lowest level that still corresponded to the flat portion of the reserve demand curve would be one approach consistent with the Committee's previously stated intention, in the Policy Normalization Principles and Plans that it issued in 2014, to "hold no more securities than necessary to implement monetary policy efficiently and effectively." However, reducing reserves to a point very close to the level at which the reserve demand curve begins to slope upward could lead to a significant increase in the volatility in short-term interest rates and require frequent sizable open market operations or new ceiling facilities to maintain effective interest rate control. These considerations suggested that it might be appropriate to instead provide a buffer of reserves sufficient to ensure that the Federal Reserve operates consistently on the flat portion of the reserve demand curve so as to promote the efficient and effective implementation of monetary policy.

Participants discussed options for maintaining control of interest rates should upward pressures on money market rates emerge during the transition to a regime with lower excess reserves. Several participants commented on options that rely on existing or currently used tools, such as further technical adjustments to the IOER rate to keep the federal funds rate within the target range or using the discount window, although such options were recognized to have limitations in some situations. Some participants commented on the possibility of slowing the pace of the decline in reserves in approaching the longer-run level of reserves. Standard temporary open market operations could be used for this purpose. In addition, participants discussed options such as ending portfolio redemptions with a relatively high level of reserves still in the system and then either maintaining that level of reserves or allowing growth in nonreserve liabilities to very gradually reduce reserves further. These approaches could allow markets and banks more time to adjust to lower reserve levels while maintaining effective control of interest rates. Several participants, however, expressed concern that a slowing of redemptions could be misinterpreted as a signal about the stance of monetary policy. Some participants expressed an interest in learning more about possible options for new ceiling tools to provide firmer control of the policy rate.

Participants commented on the role that the Federal Reserve's nonreserve liabilities have played in the expansion of the Federal Reserve's balance sheet since the financial crisis. Many participants noted that the magnitudes of these nonreserve liabilities—most significantly currency but also liabilities to the Treasury through the Treasury General Account and liabilities to foreign official institutions through their accounts at the Federal Reserve—are not closely related to Federal Reserve monetary policy decisions. They also remarked that the size of the Federal Reserve's balance sheet was expected to increase over time as the growth of these liabilities roughly tracks the growth of nominal gross domestic product (GDP). Additionally, participants cited the social benefits provided by these liabilities to the economy.

Participants considered it important to present information on the Federal Reserve's balance sheet to the public in ways that communicated these facts. In discussing the long-run level of reserve liabilities, participants noted that it might be useful to explore ways to encourage banks to reduce their demand for reserves and to provide information to banks and the public about the likely long-run level of reserves.

Participants commented on a number of issues related to the long-run composition of the SOMA portfolio. With regard to the portfolio of Treasury securities, participants discussed the advantages of different portfolio maturity compositions. Several participants noted that a portfolio of holdings weighted toward shorter maturities would provide greater flexibility to lengthen maturity if warranted by an economic downturn, while a couple of others noted that a portfolio with maturities that matched the outstanding Treasury market would have a more neutral effect on the market. With regard to the MBS portfolio, participants noted that the passive run-off of MBS holdings through principal paydowns would continue for many years after the size of the balance sheet had been normalized. Several participants commented on the possibility of reducing agency MBS holdings somewhat more quickly than the passive approach by implementing a program of very gradual MBS sales sometime after the size of the balance sheet had been normalized.

Participants expected to continue their discussion of long-run implementation frameworks and related issues at upcoming meetings. They reiterated the importance of communicating clearly on the rationale for any decision made on the implementation framework.

Developments in Financial Markets and Open Market Operations

The SOMA manager reviewed developments in financial markets over the intermeeting period. Asset prices were volatile in recent weeks, reportedly reflecting a pullback from risk-taking by investors. In part, the deterioration in risk sentiment appeared to stem importantly from uncertainty about the state of trade negotiations between China and the United States. In addition, investors pointed to concerns about the global growth outlook, the unsettled state of Brexit negotiations, and uncertainties about the political situation in Europe.

Against this backdrop, U.S. stock prices were down nearly 8 percent on the period. Risk spreads on corporate bonds widened appreciably, with market participants reportedly focusing on the potential implications of downside risks to the U.S. economic outlook for the financial condition of companies, particularly for companies at the lower end of the investment-grade spectrum. Treasury yields declined significantly, especially at longer maturities, contributing to some flattening of the Treasury yield curve. Based on readings from Treasury Inflation-Protected Securities (TIPS), the decline in nominal Treasury yields was associated with a notable drop in inflation compensation. A sizable decline in oil prices was cited as an important factor contributing to the drop in measures of inflation compensation.

The deterioration in market sentiment was accompanied by a significant downward revision in the expected path of the federal funds rate based on federal funds futures quotes. In addition, futures-based measures of policy expectations moved lower in response to speeches by Federal Reserve officials. The revision in the expected policy path was less noticeable in the Desk's survey-based measures of the expected path of the federal funds rate. Desk surveys indicated that respondents placed high odds on a further quarter-point firming in the stance of monetary policy at the December meeting, but lower than the near certainty of a rate increase reported just before previous policy firmings in 2018; survey responses anticipated that the median projected path of the federal funds rate in the Summary of Economic Projections (SEP) would show only two additional quarter-point policy firmings next year—down from the three policy firmings in the median path in the September SEP results.

The deputy manager followed with a discussion of money market developments and open market operations. After a fast narrowing of the spread between the IOER rate and the EFFR before the November meeting, the EFFR had remained stable at, or just 1 basis point below the level of the IOER rate since then. Some upward pressures on overnight rates were evident in the repurchase agreement (repo) market, apparently from higher issuance of Treasury bills and an associated expansion of primary dealer inventories over the intermeeting period. Banks expanded their lending in repo markets in light of higher repo rates relative to the IOER rate; the willingness of banks to lend in repo markets suggested that the reserve supply was still ample. The deputy manager noted the results of the recent Desk surveys of primary dealers and market participants indicating an increase in the median respondent's estimate of the long-run level of reserve balances to a level closer to that implied by banks' responses in the Senior Financial Officer Survey conducted in advance of the November FOMC meeting. The deputy manager also reported on paydowns on the SOMA securities holdings. Under the baseline outlook, prepayments of principal on agency MBS would remain below the $20 billion redemption cap for the foreseeable future. However, if longer-term interest rates moved substantively lower than assumed in the baseline, some modest reinvestments in MBS could occur for a few months next year concurrent with the pickup in seasonal turnover.

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

Staff Review of the Economic Situation

The information reviewed for the December 18–19 meeting indicated that labor market conditions continued to strengthen in recent months and that real GDP growth was strong. Consumer price inflation, as measured by the 12-month percentage change in the price index for personal consumption expenditures (PCE), was 2 percent in October. Survey-based measures of longer-run inflation expectations were little changed on balance.

Total nonfarm payroll employment expanded further in November, and job gains were strong, on average, over recent months. The national unemployment rate remained at a very low level of 3.7 percent, and both the labor force participation rate and the employment-to-population ratio also stayed flat in November. The unemployment rates for African Americans, Asians, and Hispanics in November were below their levels at the end of the previous economic expansion. The share of workers employed part time for economic reasons was still close to the lows reached in late 2007. The rates of private-sector job openings and quits were both still at high levels in October; initial claims for unemployment insurance benefits in early December were still close to historically low levels. Total labor compensation per hour in the nonfarm business sector—a volatile measure even on a four-quarter change basis—increased 2.2 percent over the four quarters ending in the third quarter. Average hourly earnings for all employees rose 3.1 percent over the 12 months ending in November.

Industrial production expanded, on net, over October and November. Output increased in the mining and utilities sectors, while manufacturing production edged down on balance. Automakers' assembly schedules suggested that production of light motor vehicles would rise in December, and new orders indexes from national and regional manufacturing surveys pointed to moderate gains in total factory output in the coming months.

Household spending continued to increase at a strong pace in recent months. Real PCE growth was brisk in October, and the components of the nominal retail sales used by the Bureau of Economic Analysis to construct its estimate of PCE rose considerably in November. The pace of light motor vehicle sales edged down in November but stayed near its recent elevated level. Key factors that influence consumer spending—including ongoing gains in real disposable personal income and the effects of earlier increases in equity prices and home values on households' net worth—continued to be supportive of solid real PCE growth in the near term. Consumer sentiment, as measured by the University of Michigan Surveys of Consumers, remained relatively upbeat through early December.

Real residential investment appeared to be declining further in the fourth quarter, likely reflecting in part the effects of the rise in mortgage interest rates over the past year on the affordability of housing. Starts of new single-family homes decreased in October and November, although starts of multifamily units rose sharply in November. Building permit issuance for new single-family homes, which tends to be a good indicator of the underlying trend in construction of such homes, moved down modestly over recent months. Sales of new homes declined markedly in October, although existing home sales increased modestly.

Growth in real private expenditures for business equipment and intellectual property looked to be picking up solidly in the fourth quarter after moderating in the previous quarter. Nominal shipments of nondefense capital goods excluding aircraft moved up in October. Forward-looking indicators of business equipment spending—such as a rising backlog of unfilled orders for nondefense capital goods excluding aircraft and upbeat readings on business sentiment—pointed to further spending gains in the near term. Nominal business expenditures for nonresidential structures outside of the drilling and mining sector declined modestly in October, while the number of crude oil and natural gas rigs in operation—an indicator of business spending for structures in the drilling and mining sector—held about steady in November through early December.

Total real government purchases appeared to be rising moderately in the fourth quarter. Nominal defense spending in October and November pointed to solid growth in real federal purchases. Real purchases by state and local governments looked to be only edging up, as nominal construction spending by these governments rose solidly in October but their payrolls declined a little in October and November.

The nominal U.S. international trade deficit widened slightly in October. Exports declined a little, with decreases in exports of agricultural products and capital goods, although exports of industrial supplies increased. Imports rose a bit, with increases in imports of consumer goods and automotive products, but imports of capital goods declined sharply from September's elevated level. Available trade data suggested that the contribution of the change in net exports to the rate of real GDP growth in the fourth quarter would be much less negative than the drag of nearly 2 percentage points in the third quarter.

Total U.S. consumer prices, as measured by the PCE price index, increased 2 percent over the 12 months ending in October. Core PCE price inflation, which excludes changes in consumer food and energy prices, was 1.8 percent over that same period. The consumer price index (CPI) rose 2.2 percent over the 12 months ending in November, and core CPI inflation was also 2.2 percent. Recent readings on survey-based measures of longer-run inflation expectations—including those from the Michigan survey, the Survey of Professional Forecasters, and the Desk's Survey of Primary Dealers and Survey of Market Participants—were little changed on balance.

Foreign economic growth continued at a moderate pace in the third quarter, as a pickup in emerging market economies (EMEs) roughly offset slowing growth in advanced foreign economies (AFEs). Among EMEs, growth in Mexico and Brazil bounced back from transitory second-quarter weakness, more than offsetting a slowdown in China and India. The softness in AFE growth partly reflected temporary factors, including disruptions from natural disasters in Japan and the adoption of new car emissions testing in Germany. Indicators for economic activity in the fourth quarter were consistent with continued moderate foreign economic growth. Foreign inflation fell in recent months, largely reflecting a significant drag from lower oil prices. Underlying inflation pressures, especially in some AFEs, remained muted.

Staff Review of the Financial Situation

Investors' perceptions of downside risks to the domestic and global outlook appeared to increase over the intermeeting period, reportedly driven in part by signs of slowing in foreign economies and growing concerns over escalating trade frictions. Both nominal U.S. Treasury yields and U.S. equity prices declined notably over the period. Financing conditions for businesses and households tightened a bit but generally remained supportive of economic growth.

Remarks by Federal Reserve officials over the intermeeting period were interpreted by market participants as signaling a shift in the stance of policy toward a more gradual path of federal funds rate increases. The market-implied path for the federal funds rate for 2019 and 2020 shifted down markedly, while the market-implied probability for a rate hike at the December FOMC meeting declined slightly though remained high.

Nominal Treasury yields fell considerably over the period, with the declines most pronounced in longer-dated maturities and contributing to a flattening of the yield curve. The spread between 10- and 2-year nominal Treasury yields narrowed to near the 20th percentile of its distribution since 1971. Investor perceptions of increased downside risks to the outlooks for domestic and foreign economic growth, including growing concerns over trade frictions between the United States and China, reportedly weighed on yields. Measures of inflation compensation derived from TIPS also decreased notably over the period along with the declines in oil prices.

Concerns over escalating trade tensions, global growth prospects, and the sustainability of corporate earnings growth were among the factors that appeared to contribute to a significant drop in U.S. equity prices. The declines were largest in the technology and retail sectors. One-month option-implied volatility on the S&P 500 index—the VIX—increased over the period and corporate credit spreads widened, consistent with the selloff in equities.

Over the intermeeting period, foreign financial markets were affected by perceived increases in downside risks to the global growth outlook and ongoing uncertainty about trade relations between the United States and China. Investors also focused on the state of negotiations over Brexit and the Italian government budget deficit. Equity markets in AFEs posted notable declines, and Europe-dedicated bond and equity funds reported strong outflows. Equity declines in EMEs were more modest, and emerging market funds received modest inflows on net.

AFE sovereign yields declined significantly, reflecting decreases in U.S. bond yields and weaker-than-expected euro-area and U.K. economic data. Measures of inflation compensation generally fell, partly reflecting sharp decreases in oil prices. Spreads of Italian sovereign yields over German counterparts narrowed amid progress on budget negotiations between the Italian government and the European Commission. The U.S. dollar appreciated modestly; although declines in U.S. yields weighed on the dollar, deteriorating global risk sentiment provided support. Ongoing uncertainty about the passage of a Brexit withdrawal agreement put downward pressure on the exchange value of the British pound.

Short-term funding markets functioned smoothly over the intermeeting period. Elevated levels of Treasury bills outstanding have continued to put upward pressure on money market rates. The EFFR held steady at or very close to the level of the IOER rate, while take-up in the overnight reverse repo facility remained near historically low levels. In offshore funding markets, the one-month foreign exchange swap basis for most major currencies increased, consistent with typical year-end pressures.

Financing conditions for nonfinancial firms remained accommodative, on net, though funding conditions for capital markets tightened somewhat as spreads on nonfinancial corporate bonds widened to near the middle of their historical distribution. Gross issuance of corporate bonds also moderated in November, driven by a significant step-down in speculative-grade bond issuance, while institutional leveraged loan issuance also slowed in November. Small business credit market conditions were little changed, and credit conditions in municipal bond markets stayed accommodative on net.

Private-sector analysts revised down their projections for year-ahead corporate earnings a bit. In many cases, nonfinancial firms' earnings reports suggested that tariffs were a salient concern in the changed outlook for corporate earnings. The pace of gross equity issuance through both seasoned and initial offerings moderated, consistent with the weakness and volatility in the stock market.

In the commercial real estate (CRE) sector, financing conditions remained accommodative. Commercial mortgage-backed securities (CMBS) spreads widened slightly over the intermeeting period but remained near post-crisis lows. Issuance of non-agency CMBS was stable while CRE loan growth remained strong at banks. Financing conditions in the residential mortgage market also remained accommodative for most borrowers, but the demand for mortgage credit softened. Purchase mortgage origination activity declined modestly, while refinance activity remained muted.

Financing conditions in consumer credit markets also remained accommodative. Broad consumer credit grew at a solid pace through September, though October and November saw credit card growth at banks edge a bit lower on average. Conditions in the consumer asset-backed securities market remained stable over the intermeeting period with slightly higher spreads and robust issuance.

Staff Economic Outlook

With some stronger-than-expected incoming data on economic activity and the recent tightening in financial conditions, particularly the decline in equity prices, the U.S. economic forecast prepared by the staff for the December FOMC meeting was little revised on balance. The staff continued to expect that real GDP growth would be strong in the fourth quarter of 2018, although somewhat slower than the rapid pace of growth in the previous two quarters. Over the 2018–20 period, real GDP was forecast to rise at a rate above the staff's estimate of potential output growth and then slow to a pace below it in 2021. The unemployment rate was projected to decline further below the staff's estimate of its longer-run natural rate but to bottom out by 2020 and begin to edge up in 2021. With labor market conditions already tight, the staff continued to assume that projected employment gains would manifest in smaller-than-usual downward pressure on the unemployment rate and in larger-than-usual upward pressure on the labor force participation rate.

The staff expected both total and core PCE price inflation to be just a touch below 2 percent in 2018, with total inflation revised down a bit because of recent declines in consumer energy prices. Core PCE price inflation was forecast to move up to 2 percent in 2019 and remain at that level through the medium term; total inflation was forecast to be a little below core inflation in 2019, reflecting projected declines in energy prices, and then to run at the same level as core inflation over the following two years. The staff's medium-term projections for both total and core PCE price inflation were little revised on net.

The staff viewed the uncertainty around its projections for real GDP growth, the unemployment rate, and inflation as similar to the average of the past 20 years. The staff also saw the risks to the forecasts for real GDP growth and the unemployment rate as balanced. On the upside, household spending and business investment could expand faster than the staff projected, supported in part by the tax cuts enacted last year. On the downside, trade policies and foreign economic developments could move in directions that have significant negative effects on U.S. economic growth. Risks to the inflation projection also were seen as balanced. The upside risk that inflation could increase more than expected in an economy that was projected to move further above its potential was counterbalanced by the downside risk that longer-term inflation expectations may be lower than was assumed in the staff forecast.

Participants' Views on Current Conditions and the Economic Outlook

In conjunction with this FOMC meeting, members of the Board of Governors and Federal Reserve Bank presidents submitted their projections of the most likely outcomes for real GDP growth, the unemployment rate, and inflation for each year from 2018 through 2021 and over the longer run, based on their individual assessments of the appropriate path for the federal funds rate. The longer-run projections represented 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 projections and policy assessments are described in the SEP, which is an addendum to these minutes.

In their discussion of the economic situation and the outlook, meeting participants agreed that information received since the FOMC met in November indicated that the labor market had continued to strengthen and that economic activity had been rising at a strong rate. Job gains had been strong, on average, in recent months, and the unemployment rate had remained low. Household spending had continued to grow strongly, while growth of business fixed investment had moderated from its rapid pace earlier in the year. On a 12-month basis, both overall inflation and inflation for items other than food and energy remained near 2 percent. Indicators of longer-term inflation expectations were little changed on balance.

In assessing the economic outlook, participants noted the contrast between the strength of incoming data on economic activity and the concerns about downside risks evident in financial markets and in reports from business contacts. Recent readings on household and business spending, inflation, and labor market conditions were largely in line with participants' expectations and indicated continued strength of the economy. By contrast, financial markets were volatile and conditions had tightened over the intermeeting period, with sizable declines in equity prices and notably wider corporate credit spreads coinciding with a continued flattening of the Treasury yield curve; in part, these changes in financial conditions appeared to reflect greater concerns about the global economic outlook. Participants also reported hearing more frequent concerns about the global economic outlook from business contacts.

After taking into account incoming economic data, information from business contacts, and the tightening of financial conditions, participants generally revised down their individual assessments of the appropriate path for monetary policy and indicated either no material change or only a modest downward revision in their assessment of the economic outlook. Economic growth was expected to remain above trend in 2019 and then slow to a pace closer to trend over the medium term. Participants who downgraded their assessment of the economic outlook pointed to a variety of factors underlying their assessment, including recent financial market developments, some softening in the foreign economic growth outlook, or a more pessimistic outlook for housing-sector activity.

In their discussion of the household sector, participants generally characterized real PCE growth as remaining strong. Participants pointed to a number of factors that were supporting consumer spending, including further gains in wages and household income reflecting a strong labor market, expansionary federal tax policies, still-upbeat readings on consumer sentiment, recent declines in oil prices, and household balance sheets that generally remained healthy despite tighter financial conditions. Although household spending overall was seen as strong, several participants noted continued weakness in residential investment. This weakness was attributed to a variety of factors, including increased mortgage rates and rising home prices. Reports from District contacts in the auto sector were mixed.

Several participants noted that business fixed investment remained solid despite a slowdown in the third quarter, as more recent data pointed to a rebound in investment spending. Business contacts in several Districts reported robust activity through the end of 2018 and planned to follow through or expand on their current capital expenditure projects. However, contacts in a number of Districts appeared less upbeat than at the time of the November meeting, as concerns about a variety of factors—including trade policy, waning fiscal stimulus, slowing global economic growth, or financial market volatility—were reportedly beginning to weigh on business sentiment. A couple of participants commented that the recent decline in oil prices could be a sign of a weakening in global demand that could weigh on capital spending by oil production companies and affect companies providing services to the oil industry. However, a couple of participants noted that the recent oil price decline could also be associated with increasing oil supply rather than softening global demand.

Contacts in the agricultural sector reported that conditions remained depressed, in part because of the effects of trade policy actions on exports and farm incomes, uncertainty about future trade agreements, and continued low commodity prices. Banks continued to report a gradual increase in agricultural loan delinquencies in recent months. Nonetheless, participants cited a few recent favorable developments, including new trade mitigation payments as well as legislative action to maintain crop insurance that was seen as reducing uncertainty.

Participants agreed that labor market conditions had remained strong. Payrolls continued to grow at an above-trend rate in November, and measures of labor market tightness such as rates of job openings and quits continued to be elevated. The unemployment rate remained at a historically low level in November, and the labor force participation rate stayed steady, which represented an improvement relative to its gradual downward-sloping underlying trend. Several participants observed that labor force participation had been improving for low-skilled workers and for prime-age workers. A couple of participants saw scope for further improvements in the labor force participation rate relative to its historical downward trend, while a couple of others judged that there was little scope for significant further improvements.

Contacts in many Districts continued to report tight labor markets with difficulties finding qualified workers. In some cases, firms were responding to these difficulties by using various types of nonwage incentives to attract and retain workers, while in other cases, firms were responding by raising wages. Many participants observed that, at the national level, most measures of nominal wage growth had risen and were currently at levels that were broadly in line with trends in productivity growth and inflation.

Participants observed that both overall and core PCE price inflation remained near 2 percent on a 12-month basis, but that core inflation had edged lower in recent months. A few participants noted that the recent declines in energy prices would likely only temporarily weigh on headline inflation. Several participants remarked that longer-term TIPS-based inflation compensation had declined notably since November, concurrent with both falling oil prices and a deterioration in investor risk sentiment. A few participants pointed to the decline in longer-term inflation compensation as an indication that longer-run inflation expectations may have edged lower, while several others cited survey-based measures as suggesting that longer-run expectations likely remained anchored. Participants generally continued to view recent price developments as consistent with their expectation that inflation would remain near the Committee's symmetric 2 percent objective on a sustained basis. Although a few participants pointed to anecdotal and survey evidence indicating rising input costs and pass-through of these higher costs to consumer prices, reports from business contacts and surveys in some other Districts suggested some moderation in inflationary pressure.

In their discussion of financial developments, participants agreed that financial markets had been volatile and financial conditions had tightened over the intermeeting period, as equity prices declined, corporate credit spreads widened, and the Treasury yield curve continued to flatten. Some participants commented that these developments may reflect an increased focus among market participants on tail risks such as a sharp escalation of trade tensions or could be a signal of a significant slowdown in the pace of economic growth in the future. A couple of participants noted that the tightening in financial conditions so far did not appear to be restraining real activity, although a more persistent tightening would undoubtedly weigh on business and household spending. Participants agreed to continue to monitor financial market developments and assess the implications of these developments for the economic outlook.

Participants commented on a number of risks associated with their outlook for economic activity, the labor market, and inflation over the medium term. Various factors that could pose downside risks for domestic economic growth and inflation were mentioned, including the possibilities of a sharper-than-expected slowdown in global economic growth, a more rapid waning of fiscal stimulus, an escalation in trade tensions, a further tightening of financial conditions, or greater-than-anticipated negative effects from the monetary policy tightening to date. A few participants expressed concern that longer-run inflation expectations would remain low, particularly if economic growth slowed more than expected. With regard to upside risks, participants noted that the effects of fiscal stimulus could turn out to be greater than expected and the uncertainties surrounding trade tensions or the global growth outlook could be resolved favorably, leading to stronger-than-expected economic outcomes, while a couple of participants suggested that tightening resource utilization in conjunction with an increase in the ability of firms to pass through increases in input costs to consumer prices could generate undesirable upward pressure on inflation. A couple of participants pointed to risks to financial stability stemming from high levels of corporate borrowing, especially by riskier firms, and elevated CRE prices. In general, participants agreed that risks to the outlook appeared roughly balanced, although some noted that downside risks may have increased of late.

In their consideration of monetary policy at this meeting, participants generally judged that the economy was evolving about as anticipated, with real economic activity rising at a strong rate, labor market conditions continuing to strengthen, and inflation near the Committee's objective. Based on their current assessments, most participants expressed the view that it would be appropriate for the Committee to raise the target range for the federal funds rate 25 basis points at this meeting. A few participants, however, favored no change in the target range at this meeting, judging that the absence of signs of upward inflation pressure afforded the Committee some latitude to wait and see how the data would develop amid the recent rise in financial market volatility and increased uncertainty about the global economic growth outlook.

With regard to the outlook for monetary policy beyond this meeting, participants generally judged that some further gradual increases in the target range for the federal funds rate would most likely be consistent with a sustained economic expansion, strong labor market conditions, and inflation near 2 percent over the medium term. With an increase in the target range at this meeting, the federal funds rate would be at or close to the lower end of the range of estimates of the longer-run neutral interest rate, and participants expressed that recent developments, including the volatility in financial markets and the increased concerns about global growth, made the appropriate extent and timing of future policy firming less clear than earlier. Against this backdrop, many participants expressed the view that, especially in an environment of muted inflation pressures, the Committee could afford to be patient about further policy firming. A number of participants noted that, before making further changes to the stance of policy, it was important for the Committee to assess factors such as how the risks that had become more pronounced in recent months might unfold and to what extent they would affect economic activity, and the effects of past actions to remove policy accommodation, which were likely still working their way through the economy.

Participants emphasized that the Committee's approach to setting the stance of policy should be importantly guided by the implications of incoming data for the economic outlook. They noted that their expectations for the path of the federal funds rate were based on their current assessment of the economic outlook. Monetary policy was not on a preset course; neither the pace nor the ultimate endpoint of future rate increases was known. If incoming information prompted meaningful reassessments of the economic outlook and attendant risks, either to the upside or the downside, their policy outlook would change. Various factors, such as the recent tightening in financial conditions and risks to the global outlook, on the one hand, and further indicators of tightness in labor markets and possible risks to financial stability from a prolonged period of tight resource utilization, on the other hand, were noted in this context.

Participants discussed ideas for effectively communicating to the public the Committee's data-dependent approach, including options for transitioning away from forward guidance language in future postmeeting statements. Several participants expressed the view that it might be appropriate over upcoming meetings to remove forward guidance entirely and replace it with language emphasizing the data-dependent nature of policy decisions.

Participants supported a plan to implement another technical adjustment to the IOER rate that would place it 10 basis points below the top of the target range for the federal funds rate. This adjustment would foster trading in the federal funds market at rates well within the FOMC's target range.

Committee Policy Action

In their discussion of monetary policy for the period ahead, members judged that information received since the Committee met in November indicated that the labor market had continued to strengthen and that economic activity had been rising at a strong rate. Job gains had been strong, on average, in recent months, and the unemployment rate had remained low. Household spending had continued to grow strongly, while growth of business fixed investment had moderated from its rapid pace earlier in the year. On a 12-month basis, both overall inflation and inflation for items other than food and energy remained near 2 percent. Indicators of longer-term inflation expectations were little changed, on balance.

Members generally judged that the economy had been evolving about as they had anticipated at the previous meeting. Though financial conditions had tightened and global growth had moderated, members generally anticipated that growth would remain above trend and the labor market would remain strong. Members judged that some further gradual increases in the target range for the federal funds rate would be consistent with sustained expansion of economic activity, strong labor market conditions, and inflation near the Committee's symmetric 2 percent objective over the medium term.

After assessing current conditions and the outlook for economic activity, the labor market, and inflation, members decided to raise the target range for the federal funds rate to 2¼ to 2½ percent. Members agreed that the timing and size of future adjustments to the target range for the federal funds rate would depend on their assessment of realized and expected economic conditions relative to the Committee's maximum employment and symmetric 2 percent inflation objectives. They reiterated that this assessment 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. More generally, members noted that decisions regarding near-term adjustments of the stance of monetary policy would appropriately remain dependent on the evolution of the outlook as informed by incoming data.

With regard to the postmeeting statement, members agreed to modify the phrase "the Committee expects that further gradual increases" to read "the Committee judges that some further gradual increases." The use of the word "judges" in the revised phrase was intended to better convey the data-dependency of the Committee's decisions regarding the future stance of policy; the reference to "some" further gradual increases was viewed as helping indicate that, based on current information, the Committee judged that a relatively limited amount of additional tightening likely would be appropriate. While members judged that the risks to the economic outlook were roughly balanced, they decided that recent developments warranted emphasizing that the Committee would "continue to monitor global economic and financial developments and assess their implications for the economic outlook."

At the conclusion of the discussion, the Committee voted to authorize and direct the Federal Reserve Bank of New York, until instructed otherwise, to execute transactions in the SOMA in accordance with the following domestic policy directive, to be released at 2:00 p.m.:

> "Effective December 20, 2018, the Federal Open Market Committee directs the Desk to undertake open market operations as necessary to maintain the federal funds rate in a target range of 2¼ to 2½ percent, including overnight reverse repurchase operations (and reverse repurchase operations with maturities of more than one day when necessary to accommodate weekend, holiday, or similar trading conventions) at an offering rate of 2.25 percent, in amounts limited only by the value of Treasury securities held outright in the System Open Market Account that are available for such operations and by a per-counterparty limit of $30 billion per day.
>
> The Committee directs the Desk to continue rolling over at auction the amount of principal payments from the Federal Reserve's holdings of Treasury securities maturing during each calendar month that exceeds $30 billion, and to continue reinvesting in agency mortgage-backed securities the amount of principal payments from the Federal Reserve's holdings of agency debt and agency mortgage-backed securities received during each calendar month that exceeds $20 billion. Small deviations from these amounts for operational reasons are acceptable.
>
> 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 vote also encompassed approval of the statement below to be released at 2:00 p.m.:

> "Information received since the Federal Open Market Committee met in November indicates that the labor market has continued to strengthen and that economic activity has been rising at a strong rate. Job gains have been strong, on average, in recent months, and the unemployment rate has remained low. Household spending has continued to grow strongly, while growth of business fixed investment has moderated from its rapid pace earlier in the year. On a 12-month basis, both overall inflation and inflation for items other than food and energy remain near 2 percent. Indicators of longer-term inflation expectations are little changed, on balance.

> Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee judges that some further gradual increases in the target range for the federal funds rate will be consistent with sustained expansion of economic activity, strong labor market conditions, and inflation near the Committee's symmetric 2 percent objective over the medium term. The Committee judges that risks to the economic outlook are roughly balanced, but will continue to monitor global economic and financial developments and assess their implications for the economic outlook.
>
> In view of realized and expected labor market conditions and inflation, the Committee decided to raise the target range for the federal funds rate to 2¼ to 2½ percent.
>
> In determining the timing and size of future adjustments to the target range for the federal funds rate, the Committee will assess realized and expected economic conditions relative to its maximum employment objective and its symmetric 2 percent inflation objective. 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."

Voting for this action: Jerome H. Powell, John C. Williams, Thomas I. Barkin, Raphael W. Bostic, Michelle W. Bowman, Lael Brainard, Richard H. Clarida, Mary C. Daly, Loretta J. Mester, and Randal K. Quarles.

Voting against this action: None.

To support the Committee's decision to raise the target range for the federal funds rate, the Board of Governors voted unanimously to raise the interest rates on required and excess reserve balances to 2.40 percent, effective December 20, 2018. The Board of Governors also voted unanimously to approve a ¼ percentage point increase in the primary credit rate (discount rate) to 3.00 percent, effective December 20, 2018.[6]

It was agreed that the next meeting of the Committee would be held on Tuesday–Wednesday, January 29–30, 2019. The meeting adjourned at 10:50 a.m. on December 19, 2018.

Notation Vote

By notation vote completed on November 28, 2018, the Committee unanimously approved the minutes of the Committee meeting held on November 7–8, 2018.

James A. Clouse
Secretary

[6] In taking this action, the Board approved requests to establish that rate submitted by the boards of directors of the Federal Reserve Banks of Boston, Cleveland, Richmond, Atlanta, Chicago, and San Francisco. This vote also encompassed approval by the Board of Governors of the establishment of a 3.00 percent primary credit rate by the remaining Federal Reserve Banks, effective on the later of December 20, 2018, and the date such Reserve Banks informed the Secretary of the Board of such a request. (Secretary's note: Subsequently, the Federal Reserve Banks of New York, Philadelphia, St. Louis, Minneapolis, Kansas City, and Dallas were informed by the Secretary of the Board's approval of their establishment of a primary credit rate of 3.00 percent, effective December 20, 2018.) The second vote of the Board also encompassed approval of the establishment of the interest rates for secondary and seasonal credit under the existing formulas for computing such rates.

Summary of Economic Projections

In conjunction with the Federal Open Market Committee (FOMC) meeting held on December 18–19, 2018, meeting participants submitted their projections of the most likely outcomes for real gross domestic product (GDP) growth, the unemployment rate, and inflation for each year from 2018 to 2021 and over the longer run.[1] Each participant's projections were based on information available at the time of the meeting, together with his or her assessment of appropriate monetary policy—including a path for the federal funds rate and its longer-run value—and assumptions about other 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.[2] "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 statutory mandate to promote maximum employment and price stability.

All participants who submitted longer-run projections expected that, under appropriate monetary policy, growth in real GDP in 2019 would run somewhat above their individual estimate of its longer-run rate. Most participants continued to expect real GDP growth to slow throughout the projection horizon, with a majority of participants projecting growth in 2021 to be a little below their estimate of its longer-run rate. Almost all participants who submitted longer-run projections continued to expect that the unemployment rate would run below their estimate of its longer-run level through 2021. Most participants projected that inflation, as measured by the four-quarter percentage change in the price index for personal consumption expenditures (PCE), would increase slightly over the next two years, and nearly all participants expected that it would be at or slightly above the Committee's 2 percent objective in 2020 and 2021. Compared with the Summary of Economic Projections (SEP) from September, many participants marked down slightly their projections for real GDP growth and inflation in 2019. Table 1 and figure 1 provide summary statistics for the projections.

As shown in figure 2, participants generally continued to expect that the evolution of the economy, relative to their objectives of maximum employment and 2 percent inflation, would likely warrant some further gradual increases in the federal funds rate. Compared with the September submissions, the median projections for the federal funds rate for the end of 2019 through 2021 and over the longer run were a little lower. Most participants expected that the federal funds rate at the end of 2020 and 2021 would be modestly higher than their estimate of its level over the longer run; however, many marked down the extent to which it would exceed their estimate of the longer-run level relative to their September projections.

On balance, participants continued to view the uncertainty around their projections as broadly similar to the average of the past 20 years. While most participants viewed the risks to the outlook as balanced, a couple more participants than in September saw risks to real GDP growth as weighted to the downside, and one less participant viewed the risks to inflation as weighted to the upside.

The Outlook for Economic Activity

The median of participants' projections for the growth rate of real GDP for 2019, conditional on their individual assessment of appropriate monetary policy, was 2.3 percent, slower than the 3.0 percent pace expected for 2018. Most participants continued to expect GDP growth to slow throughout the projection horizon, with the median projection at 2.0 percent in 2020 and at 1.8 percent in 2021, a touch lower than the median estimate of its longer-run rate of 1.9 percent. Relative to the September SEP, the medians of the projections for real GDP growth for 2018 and 2019 were slightly lower, while the median for the longer-run rate of growth was a bit higher. Several participants mentioned tighter financial conditions or a softer global economic outlook as factors behind the downward revisions to their near-term growth estimates.

The median of projections for the unemployment rate in the fourth quarter of 2019 was 3.5 percent, unchanged from the September SEP and almost 1 percentage point below the median assessment of its longer-run normal level. With participants generally continuing to expect

[1] Five members of the Board of Governors, one more than in September 2018, were in office at the time of the December 2018 meeting and submitted economic projections.

[2] One participant did not submit longer-run projections for real GDP growth, the unemployment rate, or the federal funds rate.

Table 1. Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents, under their individual assessments of projected appropriate monetary policy, December 2018

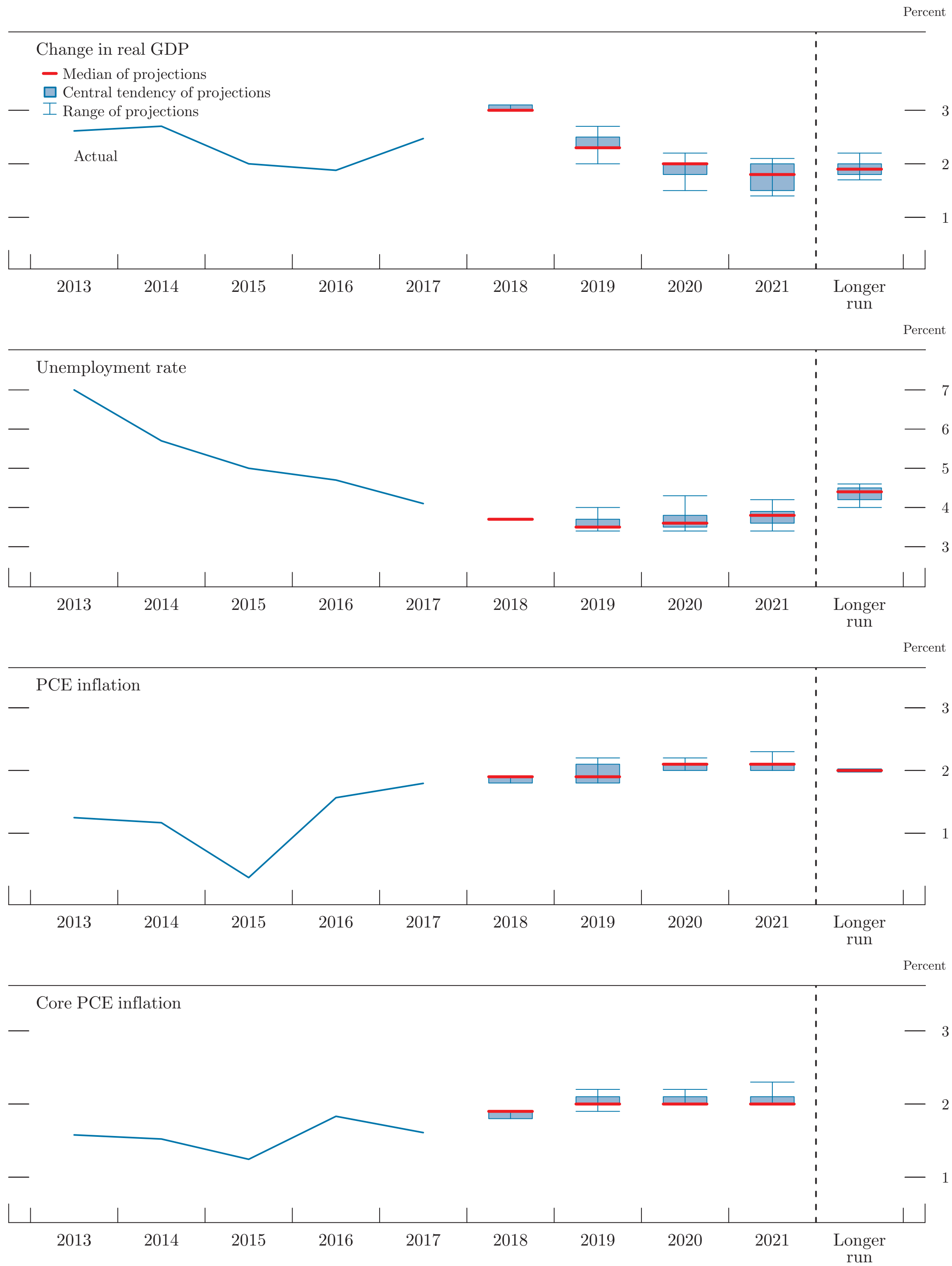
Percent

Variable	Median[1]					Central tendency[2]					Range[3]				
	2018	2019	2020	2021	Longer run	2018	2019	2020	2021	Longer run	2018	2019	2020	2021	Longer run
Change in real GDP	3.0	2.3	2.0	1.8	1.9	3.0 – 3.1	2.3 – 2.5	1.8 – 2.0	1.5 – 2.0	1.8 – 2.0	3.0 – 3.1	2.0 – 2.7	1.5 – 2.2	1.4 – 2.1	1.7 – 2.2
September projection	3.1	2.5	2.0	1.8	1.8	3.0 – 3.2	2.4 – 2.7	1.8 – 2.1	1.6 – 2.0	1.8 – 2.0	2.9 – 3.2	2.1 – 2.8	1.7 – 2.4	1.5 – 2.1	1.7 – 2.1
Unemployment rate	3.7	3.5	3.6	3.8	4.4	3.7	3.5 – 3.7	3.5 – 3.8	3.6 – 3.9	4.2 – 4.5	3.7	3.4 – 4.0	3.4 – 4.3	3.4 – 4.2	4.0 – 4.6
September projection	3.7	3.5	3.5	3.7	4.5	3.7	3.4 – 3.6	3.4 – 3.8	3.5 – 4.0	4.3 – 4.6	3.7 – 3.8	3.4 – 3.8	3.3 – 4.0	3.4 – 4.2	4.0 – 4.6
PCE inflation	1.9	1.9	2.1	2.1	2.0	1.8 – 1.9	1.8 – 2.1	2.0 – 2.1	2.0 – 2.1	2.0	1.8 – 1.9	1.8 – 2.2	2.0 – 2.2	2.0 – 2.3	2.0
September projection	2.1	2.0	2.1	2.1	2.0	2.0 – 2.1	2.0 – 2.1	2.1 – 2.2	2.0 – 2.2	2.0	1.9 – 2.2	2.0 – 2.3	2.0 – 2.2	2.0 – 2.3	2.0
Core PCE inflation[4]	1.9	2.0	2.0	2.0		1.8 – 1.9	2.0 – 2.1	2.0 – 2.1	2.0 – 2.1		1.8 – 1.9	1.9 – 2.2	2.0 – 2.2	2.0 – 2.3	
September projection	2.0	2.1	2.1	2.1		1.9 – 2.0	2.0 – 2.1	2.1 – 2.2	2.0 – 2.2		1.9 – 2.0	2.0 – 2.3	2.0 – 2.2	2.0 – 2.3	
Memo: Projected appropriate policy path															
Federal funds rate	2.4	2.9	3.1	3.1	2.8	2.4	2.6 – 3.1	2.9 – 3.4	2.6 – 3.1	2.5 – 3.0	2.1 – 2.4	2.4 – 3.1	2.4 – 3.6	2.4 – 3.6	2.5 – 3.5
September projection	2.4	3.1	3.4	3.4	3.0	2.1 – 2.4	2.9 – 3.4	3.1 – 3.6	2.9 – 3.6	2.8 – 3.0	2.1 – 2.4	2.1 – 3.6	2.1 – 3.9	2.1 – 4.1	2.5 – 3.5

NOTE: Projections of change in real gross domestic product (GDP) and projections for both measures of inflation are percent changes 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 projections for the federal funds rate are the value of the midpoint of the projected appropriate target range for the federal funds rate or the projected appropriate target level for the federal funds rate at the end of the specified calendar year or over the longer run. The September projections were made in conjunction with the meeting of the Federal Open Market Committee on September 25–26, 2018. One participant did not submit longer-run projections for the change in real GDP, the unemployment rate, or the federal funds rate in conjunction with the September 25–26, 2018, meeting, and one participant did not submit such projections in conjunction with the December 18–19, 2018, meeting.

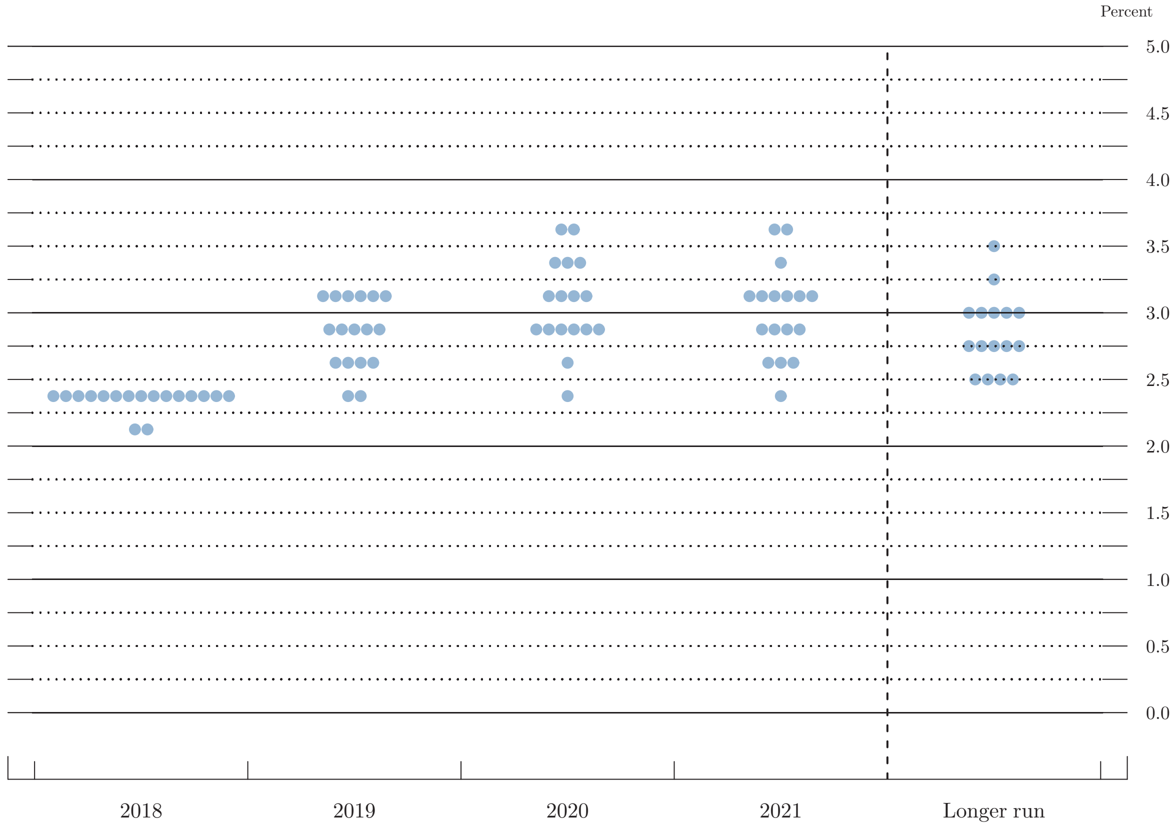
1. For each period, the median is the middle projection when the projections are arranged from lowest to highest. When the number of projections is even, the median is the average of the two middle projections.
2. The central tendency excludes the three highest and three lowest projections for each variable in each year.
3. The range for a variable in a given year includes all participants' projections, from lowest to highest, for that variable in that year.
4. Longer-run projections for core PCE inflation are not collected.

Figure 1. Medians, central tendencies, and ranges of economic projections, 2018–21 and over the longer run



NOTE: Definitions of variables and other explanations are in the notes to table 1. The data for the actual values of the variables are annual.

Figure 2. FOMC participants' assessments of appropriate monetary policy: Midpoint of target range or target level for the federal funds rate



Note: 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. One participant did not submit longer-run projections for the federal funds rate.

the unemployment rate to bottom out in 2019 or 2020, the median projections for 2020 and 2021 edged back up to 3.6 percent and 3.8 percent, respectively. Nevertheless, most participants continued to project that the unemployment rate in 2021 would still be well below their estimates of its longer-run level. The median estimate of the longer-run normal rate of unemployment was slightly lower than in September.

Figures 3.A and 3.B show the distributions of participants' projections for real GDP growth and the unemployment rate from 2018 to 2021 and in the longer run. The distributions of individual projections for real GDP growth for 2019 and 2020 shifted down relative to those in the September SEP, while the distributions for 2021 and for the longer-run rate of GDP growth were little changed. The distribution of individual projections for the unemployment rate in 2019 was a touch more dispersed relative to the distribution of the September projections; the distribution moved slightly higher for 2020, while the distribution for the longer-run normal rate shifted toward the lower end of its range.

The Outlook for Inflation

The median of projections for total PCE price inflation was 1.9 percent in 2019, a bit lower than in the September SEP, while the medians for 2020 and 2021 were 2.1 percent, the same as in the previous projections. The medians of projections for core PCE price inflation over the 2019–21 period were 2.0 percent, a touch lower than in September. Some participants pointed to softer incoming data or recent declines in oil prices as reasons for shaving their projections for inflation.

Figures 3.C and 3.D provide information on the distributions of participants' views about the outlook for inflation. On the whole, the distributions of projections for total PCE price inflation and core PCE price inflation beyond this year either shifted slightly to the left or were unchanged relative to the September SEP. Most participants revised down slightly their projections of total PCE price inflation for 2019. All participants expected that total PCE price inflation would be in a range from 2.0 to 2.3 percent in 2020 and 2021. Most participants projected that core PCE inflation would run at 2.0 to 2.1 percent throughout the projection horizon.

Appropriate Monetary Policy

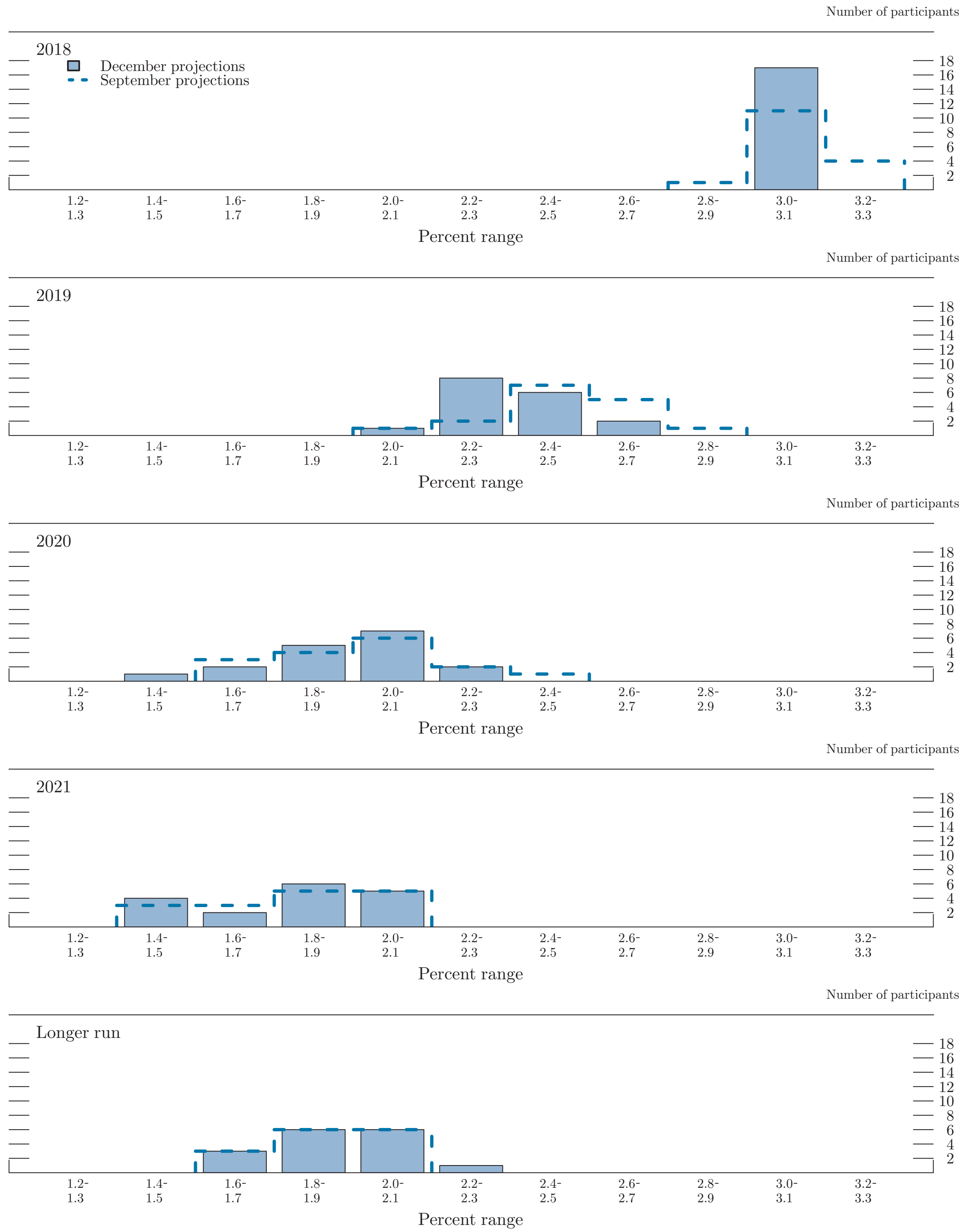
Figure 3.E shows distributions of participants' judgments regarding the appropriate target—or midpoint of the target range—for the federal funds rate at the end of each year from 2018 to 2021 and over the longer run. The distributions for 2019 through 2021 were less dispersed and shifted slightly toward lower values. Compared with the projections prepared for the September SEP, the median federal funds rate was 25 basis points lower over the 2019–21 period. For the end of 2019, the median of federal funds rate projections was 2.88 percent, consistent with two 25 basis point rate increases over the course of 2019. Thereafter, the medians of the projections were 3.13 percent at the end of 2020 and 2021. Most participants expected that the federal funds rate at the end of 2020 and 2021 would be modestly higher than their estimate of its level over the longer run; however, many marked down the extent to which it would exceed their estimate of the longer-run level relative to their September projections. The median of the longer-run projections of the federal funds rate was 2.75 percent, 25 basis points lower than in September.

In discussing their projections, many participants continued to express the view that any further increases in the federal funds rate over the next few years would likely be gradual. That anticipated pace reflected a few factors, such as a short-term neutral real interest rate that is currently low and an inflation rate that has been rising only gradually to the Committee's 2 percent objective. Some participants cited a weaker near-term trajectory for economic growth or a muted response of inflation to tight labor market conditions as factors contributing to the downward revisions in their assessments of the appropriate path for the policy rate.

Uncertainty and Risks

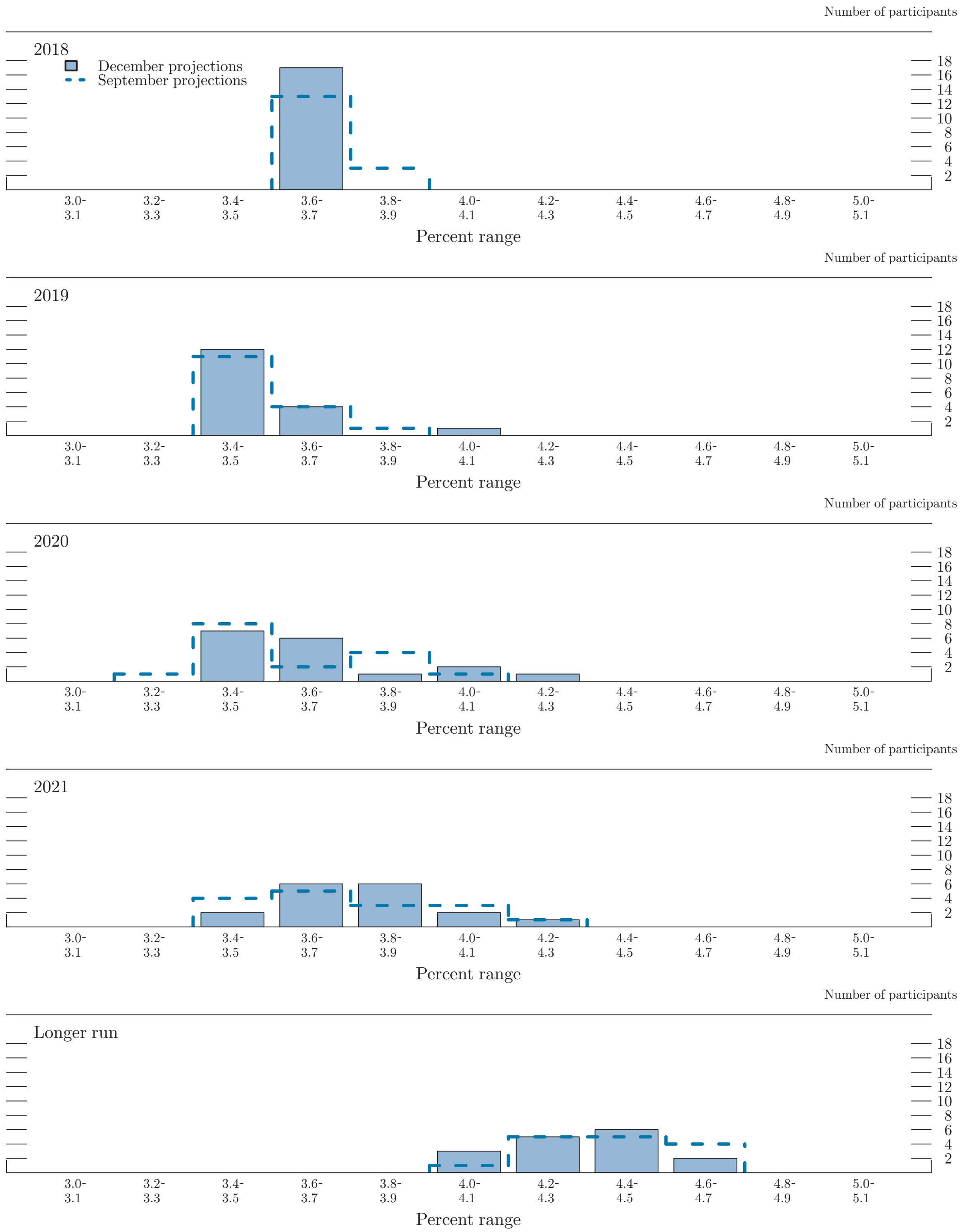
In assessing the appropriate path of the federal funds rate, FOMC participants take account of the range of possible economic outcomes, the likelihood of those outcomes, and the potential benefits and costs should they occur. As a reference, table 2 provides measures of forecast uncertainty—based on the forecast errors of various private and government forecasts over the past 20 years—for real GDP growth, the unemployment rate, and total PCE price inflation. Those measures are represented graphically in the "fan charts" shown in the top panels of figures 4.A, 4.B, and 4.C. The fan charts display the median SEP projections for the three variables surrounded by symmetric confidence intervals derived from the forecast errors reported in table 2. If the degree of uncertainty attending these projections is similar to the typical magnitude of past forecast errors and the risks around the projections are broadly balanced, then future outcomes of these variables would have about a 70 percent probability of being within these confidence intervals. For all three variables, this measure of

Figure 3.A. Distribution of participants' projections for the change in real GDP, 2018–21 and over the longer run



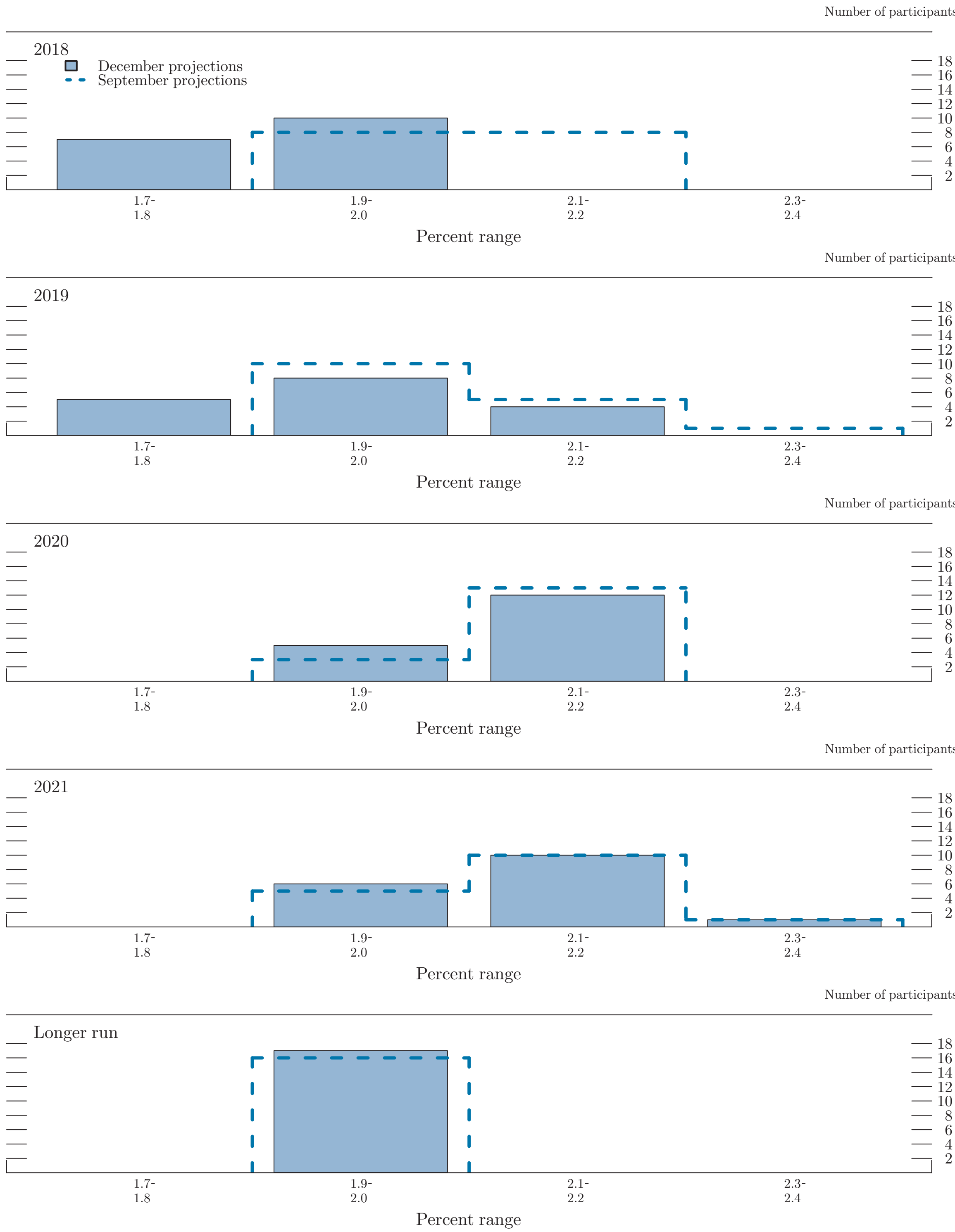
Note: Definitions of variables and other explanations are in the notes to table 1.

Figure 3.B. Distribution of participants' projections for the unemployment rate, 2018–21 and over the longer run



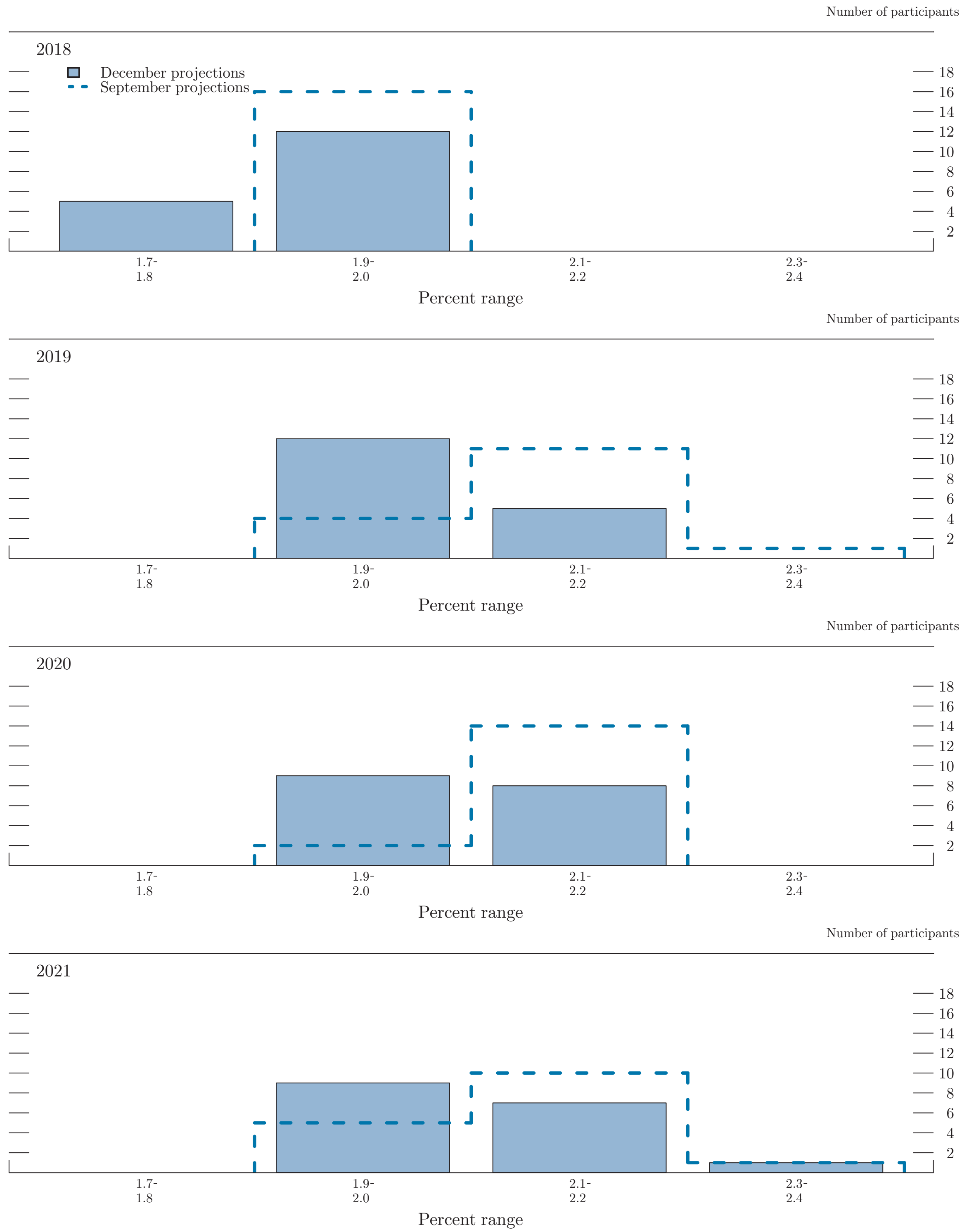
NOTE: Definitions of variables and other explanations are in the notes to table 1.

Figure 3.C. Distribution of participants' projections for PCE inflation, 2018–21 and over the longer run



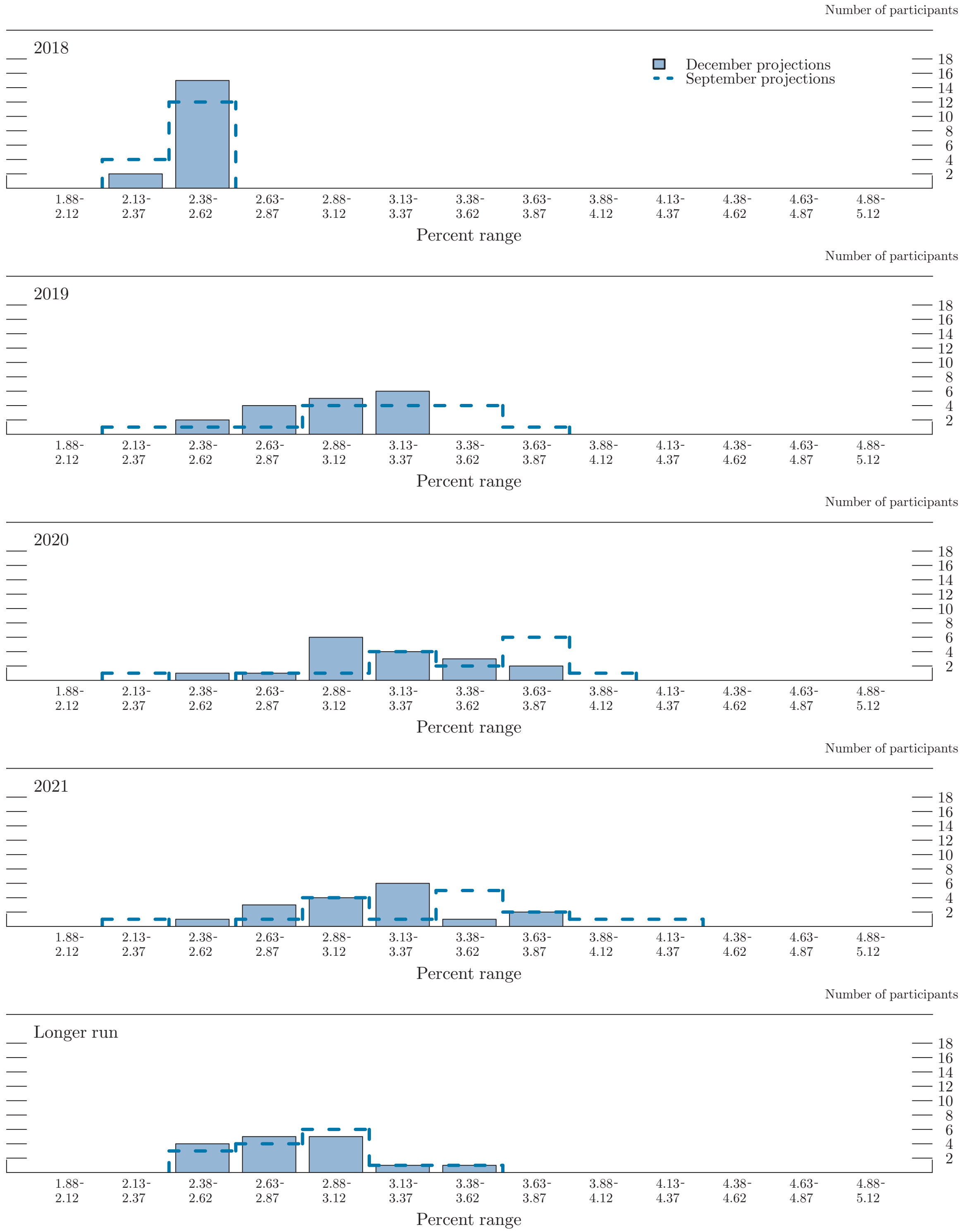
Note: Definitions of variables and other explanations are in the notes to table 1.

Figure 3.D. Distribution of participants' projections for core PCE inflation, 2018–21



NOTE: Definitions of variables and other explanations are in the notes 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, 2018–21 and over the longer run



NOTE: Definitions of variables and other explanations are in the notes to table 1.

Table 2. Average historical projection error ranges
Percentage points

Variable	2018	2019	2020	2021
Change in real GDP[1]	±0.8	±1.6	±2.1	±2.1
Unemployment rate[1]	±0.1	±0.8	±1.5	±1.9
Total consumer prices[2]	±0.2	±1.0	±1.0	±1.0
Short-term interest rates[3]	±0.1	±1.4	±2.0	±2.4

NOTE: Error ranges shown are measured as plus or minus the root mean squared error of projections for 1998 through 2017 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, consumer prices, and the federal funds rate 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 (2017), "Gauging the Uncertainty of the Economic Outlook Using Historical Forecasting Errors: The Federal Reserve's Approach," Finance and Economics Discussion Series 2017-020 (Washington: Board of Governors of the Federal Reserve System, February), https://dx.doi.org/10.17016/FEDS.2017.020.

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. Projections are percent changes on a fourth quarter to fourth quarter basis.

3. For Federal Reserve staff forecasts, measure is the federal funds rate. For other forecasts, measure is the rate on 3-month Treasury bills. Projection errors are calculated using average levels, in percent, in the fourth quarter.

uncertainty is substantial and generally increases as the forecast horizon lengthens.

Participants' assessments of the level of uncertainty surrounding their individual economic projections are shown in the bottom-left panels of figures 4.A, 4.B, and 4.C. Participants generally continued to view the degree of uncertainty attached to their economic projections for real GDP growth and inflation as broadly similar to the average of the past 20 years.[3] A couple more participants than in September viewed the uncertainty around the unemployment rate as higher than average.

Because the fan charts are constructed to be symmetric around the median projections, they do not reflect any asymmetries in the balance of risks that participants may see in their economic projections. Participants' assessments of the balance of risks to their economic projections are shown in the bottom-right panels of figures 4.A, 4.B, and 4.C. Most participants generally judged the risks to the outlook for real GDP growth, the unemployment rate, headline inflation, and core inflation as broadly balanced—in other words, as broadly consistent with a symmetric fan chart. Two more participants than in September saw the risks to real GDP growth as weighted to the downside, and one less judged the risks as weighted to the upside. The balance of risks to the projection for the unemployment rate was unchanged, with three participants judging the risks to the unemployment rate as weighted to the downside and two participants viewing the risks as weighted to the upside. In addition, the balance of risks to the inflation projections shifted down slightly relative to September, as one less participant judged the risks to both total and core inflation as weighted to the upside and one more participant viewed the risks as weighted to the downside.

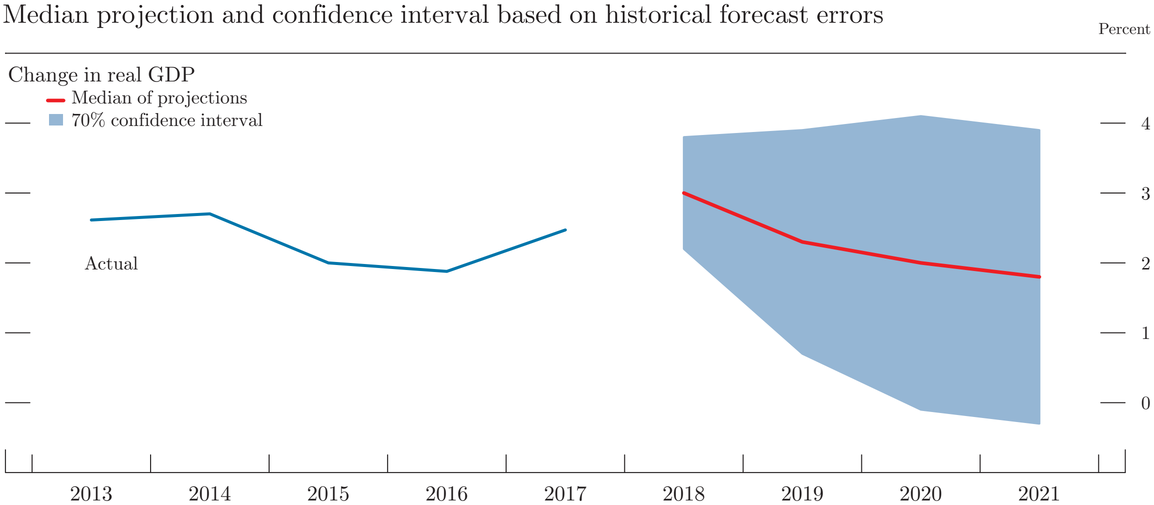
In discussing the uncertainty and risks surrounding their economic projections, participants mentioned trade tensions as well as financial and foreign economic developments as sources of uncertainty or downside risk to the growth outlook. For the inflation outlook, the effects of trade restrictions were cited as upside risks and lower energy prices and the stronger dollar as downside risks. Those who commented on U.S. fiscal policy viewed it as an additional source of uncertainty and noted that it might present two-sided risks to the outlook, as its effects could be waning faster than expected or turn out to be more stimulative than anticipated.

Participants' assessments of the appropriate future path of the federal funds rate were also subject to considerable uncertainty. Because the Committee adjusts the federal funds rate in response to actual and prospective developments over time in real GDP growth, the unemployment rate, and inflation, uncertainty surrounding the projected path for the federal funds rate importantly reflects the uncertainties about the paths for those key economic variables along with other factors. Figure 5 provides a graphical representation of this uncertainty, plotting the median SEP projection for the federal funds rate surrounded by confidence intervals derived from the results presented in table 2. As with the macroeconomic variables, the forecast uncertainty surrounding the appropriate path of the federal funds rate is substantial and increases for longer horizons.

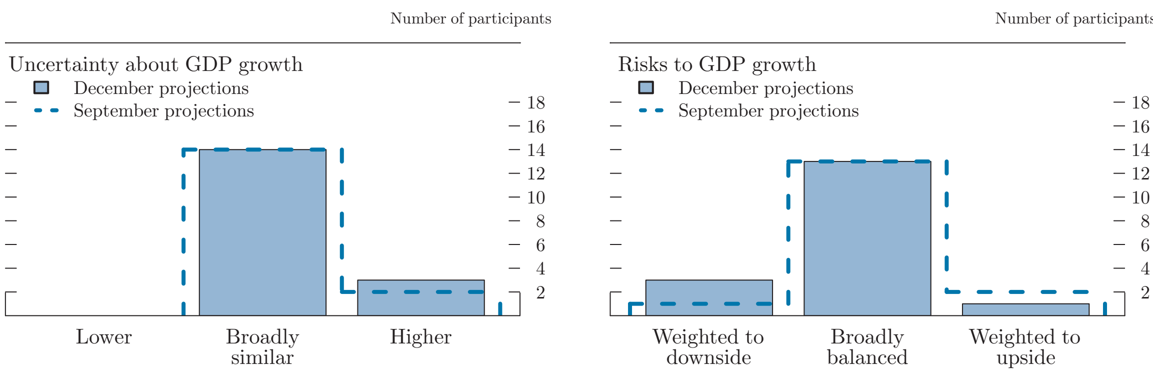
[3] At the end of this summary, the box "Forecast Uncertainty" discusses the sources and interpretation of uncertainty surrounding the economic forecasts and explains the approach used to assess the uncertainty and risks attending the participants' projections.

Figure 4.A. Uncertainty and risks in projections of GDP growth

Median projection and confidence interval based on historical forecast errors



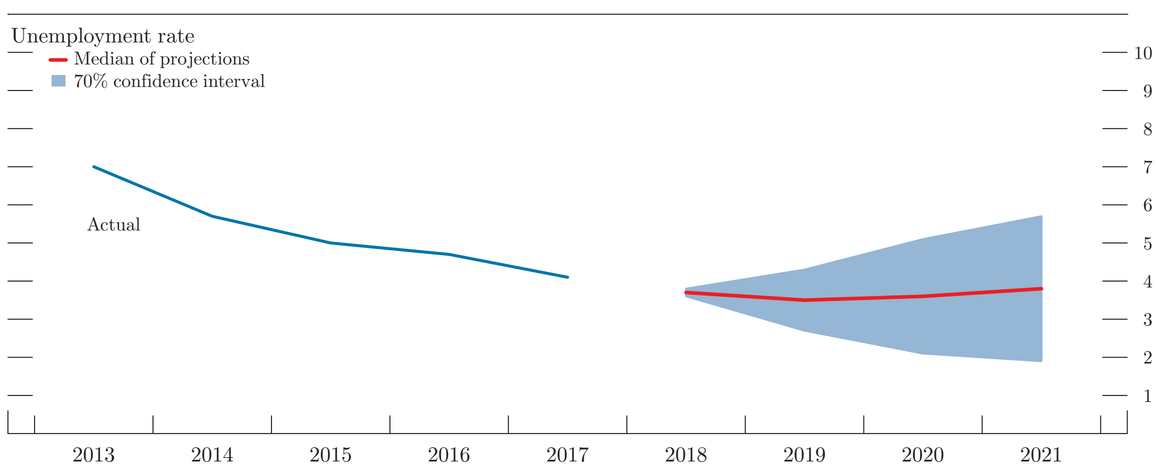
FOMC participants' assessments of uncertainty and risks around their economic projections



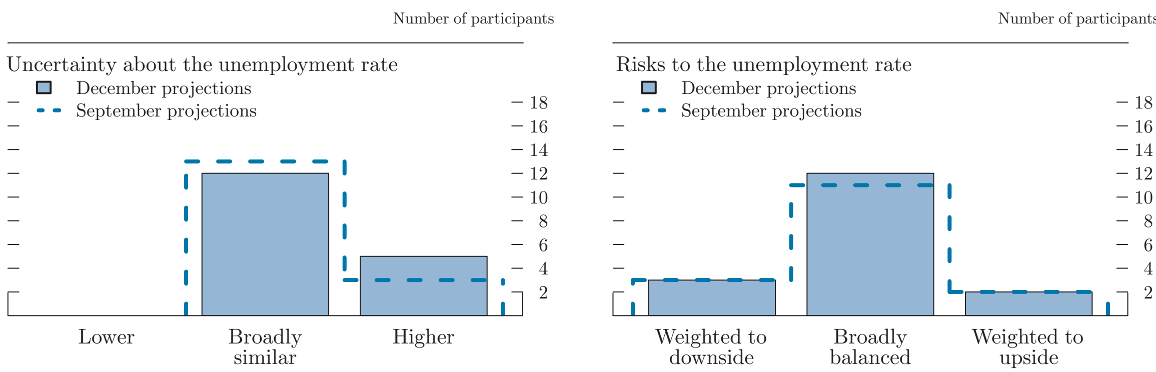
NOTE: The blue and red lines in the top panel show actual values and median projected values, respectively, of the percent change in real gross domestic product (GDP) from the fourth quarter of the previous year to the fourth quarter of the year indicated. The confidence interval around the median projected values is assumed to be symmetric and is based on root mean squared errors of various private and government forecasts made over the previous 20 years; more information about these data is available in table 2. Because current conditions may differ from those that prevailed, on average, over the previous 20 years, the width and shape of the confidence interval estimated on the basis of the historical forecast errors may not reflect FOMC participants' current assessments of the uncertainty and risks around their projections; these current assessments are summarized in the lower panels. Generally speaking, participants who judge the uncertainty about their projections as "broadly similar" to the average levels of the past 20 years would view the width of the confidence interval shown in the historical fan chart as largely consistent with their assessments of the uncertainty about their projections. Likewise, participants who judge the risks to their projections as "broadly balanced" would view the confidence interval around their projections as approximately symmetric. For definitions of uncertainty and risks in economic projections, see the box "Forecast Uncertainty."

Figure 4.B. Uncertainty and risks in projections of the unemployment rate

Median projection and confidence interval based on historical forecast errors

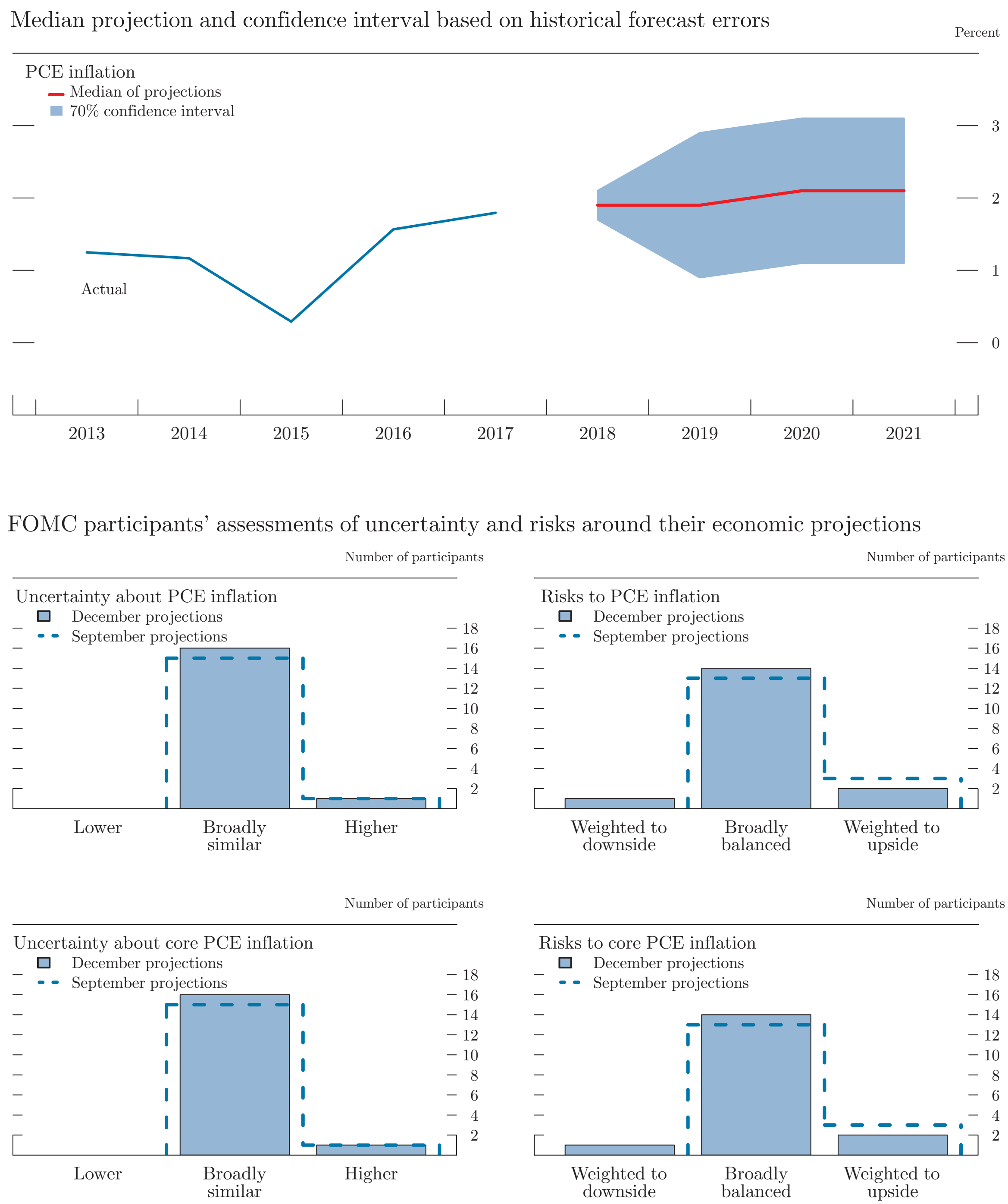


FOMC participants' assessments of uncertainty and risks around their economic projections



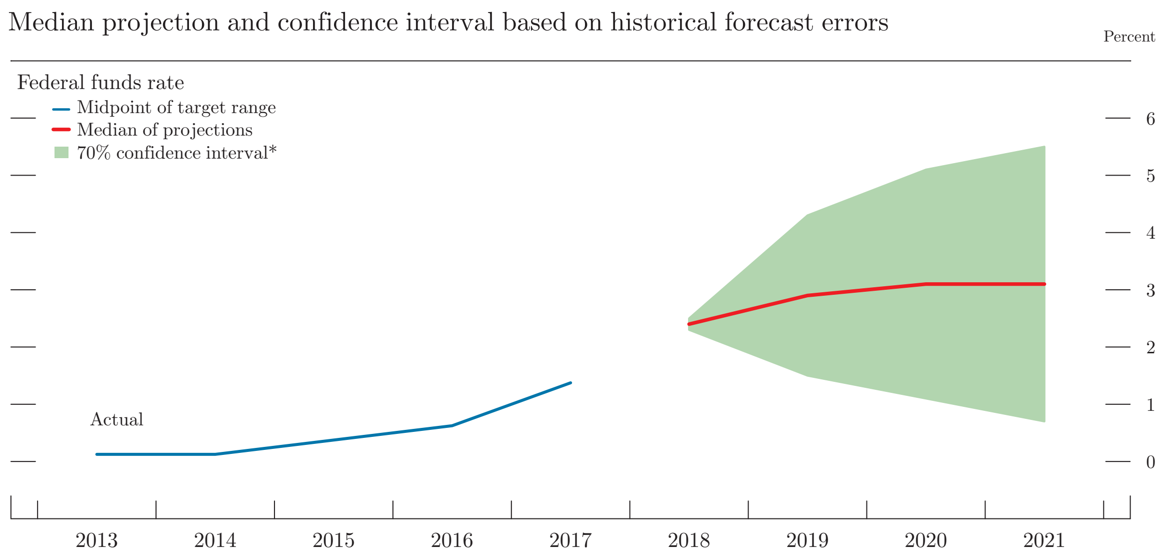
Note: The blue and red lines in the top panel show actual values and median projected values, respectively, of the average civilian unemployment rate in the fourth quarter of the year indicated. The confidence interval around the median projected values is assumed to be symmetric and is based on root mean squared errors of various private and government forecasts made over the previous 20 years; more information about these data is available in table 2. Because current conditions may differ from those that prevailed, on average, over the previous 20 years, the width and shape of the confidence interval estimated on the basis of the historical forecast errors may not reflect FOMC participants' current assessments of the uncertainty and risks around their projections; these current assessments are summarized in the lower panels. Generally speaking, participants who judge the uncertainty about their projections as "broadly similar" to the average levels of the past 20 years would view the width of the confidence interval shown in the historical fan chart as largely consistent with their assessments of the uncertainty about their projections. Likewise, participants who judge the risks to their projections as "broadly balanced" would view the confidence interval around their projections as approximately symmetric. For definitions of uncertainty and risks in economic projections, see the box "Forecast Uncertainty."

Figure 4.C. Uncertainty and risks in projections of PCE inflation



NOTE: The blue and red lines in the top panel show actual values and median projected values, respectively, of the percent change in the price index for personal consumption expenditures (PCE) from the fourth quarter of the previous year to the fourth quarter of the year indicated. The confidence interval around the median projected values is assumed to be symmetric and is based on root mean squared errors of various private and government forecasts made over the previous 20 years; more information about these data is available in table 2. Because current conditions may differ from those that prevailed, on average, over the previous 20 years, the width and shape of the confidence interval estimated on the basis of the historical forecast errors may not reflect FOMC participants' current assessments of the uncertainty and risks around their projections; these current assessments are summarized in the lower panels. Generally speaking, participants who judge the uncertainty about their projections as "broadly similar" to the average levels of the past 20 years would view the width of the confidence interval shown in the historical fan chart as largely consistent with their assessments of the uncertainty about their projections. Likewise, participants who judge the risks to their projections as "broadly balanced" would view the confidence interval around their projections as approximately symmetric. For definitions of uncertainty and risks in economic projections, see the box "Forecast Uncertainty."

Figure 5. Uncertainty in projections of the federal funds rate



Note: The blue and red lines are based on actual values and median projected values, respectively, of the Committee's target for the federal funds rate at the end of the year indicated. The actual values are the midpoint of the target range; the median projected values are based on either the midpoint of the target range or the target level. The confidence interval around the median projected values is based on root mean squared errors of various private and government forecasts made over the previous 20 years. The confidence interval is not strictly consistent with the projections for the federal funds rate, primarily because these projections are not forecasts of the likeliest outcomes for the federal funds rate, but rather projections of participants' individual assessments of appropriate monetary policy. Still, historical forecast errors provide a broad sense of the uncertainty around the future path of the federal funds rate generated by the uncertainty about the macroeconomic variables as well as additional adjustments to monetary policy that may be appropriate to offset the effects of shocks to the economy.

The confidence interval is assumed to be symmetric except when it is truncated at zero—the bottom of the lowest target range for the federal funds rate that has been adopted in the past by the Committee. This truncation would not be intended to indicate the likelihood of the use of negative interest rates to provide additional monetary policy accommodation if doing so was judged appropriate. In such situations, the Committee could also employ other tools, including forward guidance and large-scale asset purchases, to provide additional accommodation. Because current conditions may differ from those that prevailed, on average, over the previous 20 years, the width and shape of the confidence interval estimated on the basis of the historical forecast errors may not reflect FOMC participants' current assessments of the uncertainty and risks around their projections.

* The confidence interval is derived from forecasts of the average level of short-term interest rates in the fourth quarter of the year indicated; more information about these data is available in table 2. The shaded area encompasses less than a 70 percent confidence interval if the confidence interval has been truncated at zero.

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 Report*s and those prepared by the Federal Reserve Board's staff in advance of meetings of the Federal Open Market Committee (FOMC). 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 2.2 to 3.8 percent in the current year, 1.4 to 4.6 percent in the second year, and 0.9 to 5.1 percent in the third and fourth years. The corresponding 70 percent confidence intervals for overall inflation would be 1.8 to 2.2 percent in the current year and 1.0 to 3.0 percent in the second, third, and fourth years. Figures 4.A through 4.C illustrate these confidence bounds in "fan charts" that are symmetric and centered on the medians of FOMC participants' projections for GDP growth, the unemployment rate, and inflation. However, in some instances, the risks around the projections may not be symmetric. In particular, the unemployment rate cannot be negative; furthermore, the risks around a particular projection might be tilted to either the upside or the downside, in which case the corresponding fan chart would be asymmetrically positioned around the median projection.

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 economic variable is greater than, smaller than, or broadly similar to typical levels of forecast uncertainty seen in the past 20 years, as presented in table 2 and reflected in the widths of the confidence intervals shown in the top panels of figures 4.A through 4.C. Participants' current assessments of the uncertainty surrounding their projections are summarized in the bottom-left panels of those figures. 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, while the symmetric historical fan charts shown in the top panels of figures 4.A through 4.C imply that the risks to participants' projections are balanced, participants may judge that there is a greater risk that a given variable will be above rather than below their projections. These judgments are summarized in the lower-right panels of figures 4.A through 4.C.

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. The final line in table 2 shows the error ranges for forecasts of short-term interest rates. They suggest that the historical confidence intervals associated with projections of the federal funds rate are quite wide. It should be noted, however, that these confidence intervals are not strictly consistent with the projections for the federal funds rate, as these projections are not forecasts of the most likely quarterly outcomes but rather are projections of participants' individual assessments of appropriate monetary policy and are on an end-of-year basis. However, the forecast errors should provide a sense of the uncertainty around the future path of the federal funds rate generated by the uncertainty about the macroeconomic variables as well as additional adjustments to monetary policy that would be appropriate to offset the effects of shocks to the economy.

If at some point in the future the confidence interval around the federal funds rate were to extend below zero, it would be truncated at zero for purposes of the fan chart shown in figure 5; zero is the bottom of the lowest target range for the federal funds rate that has been adopted by the Committee in the past. This approach to the construction of the federal funds rate fan chart would be merely a convention; it would not have any implications for possible future policy decisions regarding the use of negative interest rates to provide additional monetary policy accommodation if doing so were appropriate. In such situations, the Committee could also employ other tools, including forward guidance and asset purchases, to provide additional accommodation.

While figures 4.A through 4.C provide information on the uncertainty around the economic projections, figure 1 provides information on the range of views across FOMC participants. A comparison of figure 1 with figures 4.A through 4.C shows that the dispersion of the projections across participants is much smaller than the average forecast errors over the past 20 years.