Minutes of the Federal Open Market Committee
June 13–14, 2017

A joint meeting of the Federal Open Market Committee and the Board of Governors was held in the offices of the Board of Governors of the Federal Reserve System in Washington, D.C., on Tuesday, June 13, 2017, at 1:00 p.m. and continued on Wednesday, June 14, 2017, at 9:00 a.m.[1]

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

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

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

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

Beth Anne Wilson, James A. Clouse, Thomas A. Connors, Eric M. Engen, Evan F. Koenig, Jonathan P. McCarthy, William Wascher, and Mark L.J. Wright, Associate Economists

Simon Potter, Manager, System Open Market Account

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

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

Matthew J. Eichner,[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

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

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

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

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

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

Christopher J. Erceg, Senior Associate Director, Division of International Finance, Board of Governors; Joshua Gallin, Senior Associate Director, Division of Research and Statistics, Board of Governors; Gretchen C. Weinbach,[2] Senior Associate Director, Division of Monetary Affairs, Board of Governors

Antulio N. Bomfim, Ellen E. Meade, and Edward Nelson, Senior Advisers, Division of Monetary Affairs, Board of Governors; Jeremy B. Rudd, Senior Adviser, Division of Research and Statistics, Board of Governors

Rochelle M. Edge, Associate Director, Division of Financial Stability, 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 System Open Market Account reinvestment policy.

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

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

Christopher J. Gust, Assistant Director, Division of Monetary Affairs, Board of Governors; Norman J. Morin and Karen M. Pence, Assistant Directors, Division of Research and Statistics, Board of Governors

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

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

Giovanni Favara and Rebecca Zarutskie, Section Chiefs, Division of Monetary Affairs, Board of Governors

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

Kimberly Bayard, Group Manager, Division of Research and Statistics, Board of Governors

Stephen Lin, Principal Economist, Division of International Finance, Board of Governors; Lubomir Petrasek, Principal Economist, Division of Monetary Affairs, Board of Governors

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

Marie Gooding, First Vice President, Federal Reserve Bank of Atlanta

David Altig, Kartik B. Athreya, Mary Daly, Jeff Fuhrer, and Christopher J. Waller, Executive Vice Presidents, Federal Reserve Banks of Atlanta, Richmond, San Francisco, Boston, and St. Louis, respectively

Spencer Krane and Ellis W. Tallman, Senior Vice Presidents, Federal Reserve Banks of Chicago and Cleveland, respectively

Roc Armenter and Kathryn B. Chen,[3] Vice Presidents, Federal Reserve Banks of Philadelphia and New York, respectively

Andrew T. Foerster, Senior Economist, Federal Reserve Bank of Kansas City

Selection of Committee Officer

By unanimous vote, the Committee selected Mark L.J. Wright to serve as Associate Economist, effective June 13, 2017, until the selection of his successor at the first regularly scheduled meeting of the Committee in 2018.

Developments in Financial Markets and Open Market Operations

The manager of the System Open Market Account (SOMA) reported on developments in domestic and foreign financial markets over the period since the May FOMC meeting. Yields on Treasury securities and the foreign exchange value of the dollar had declined modestly, while equity prices had continued to rise, contributing to a further easing of financial conditions according to some measures. Moreover, realized and implied volatility in financial markets remained low. Meanwhile, inflation compensation edged lower. Survey results and market pricing suggested that market participants saw a high probability of an increase in the FOMC's target range for the federal funds rate at this meeting.

The deputy manager reviewed survey results on market expectations for SOMA reinvestment policy and for the evolution of the System's balance sheet over coming years. The deputy manager also commented on money market developments. Over the intermeeting period, the federal funds rate remained well within the FOMC's target range, and take-up at the System's overnight reverse repurchase agreement facility was little changed from the previous period. The spread between the three-month London interbank offered rate and the overnight index swap (OIS) rate had narrowed markedly in recent months after rising noticeably in advance of the implementation of money market fund reform in the fall of 2016. The deputy manager also summarized details of the operational approach that the Open Market Desk

[3] Attended through the staff report on the economic and financial situation.

planned to follow if the Committee adopted the proposal for SOMA reinvestment policy to be considered at this meeting.

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.

System Open Market Account Reinvestment Policy
The Chair observed that, starting with the March 2017 FOMC meeting, Committee participants had been discussing approaches to reducing the Federal Reserve's securities holdings in a gradual and predictable manner. She noted that participants appeared to have reached a consensus on an approach that involved specifying caps on the monthly amount of principal payments from securities holdings that would not be reinvested; these caps would rise over the period of a year, after which they would remain constant. Given this consensus, the Chair proposed that participants approve the plan and that it be published as an addendum to the Committee's Policy Normalization Principles and Plans; the addendum would be released at the conclusion of this meeting so as to inform the public well in advance of implementing the reinvestment policy. It was anticipated that when the Committee determined that economic conditions warranted implementation of the program, that step would be communicated through the Committee's postmeeting statement. Participants unanimously supported the proposal.

POLICY NORMALIZATION PRINCIPLES AND PLANS
(Addendum adopted June 13, 2017)

All participants agreed to augment the Committee's Policy Normalization Principles and Plans by providing the following additional details regarding the approach the FOMC intends to use to reduce the Federal Reserve's holdings of Treasury and agency securities once normalization of the level of the federal funds rate is well under way.[1]

- The Committee intends to gradually reduce the Federal Reserve's securities holdings by decreasing its reinvestment of the principal payments it receives from securities held in the System Open Market Account. Specifically, such payments will be reinvested only to the extent that they exceed gradually rising caps.
  - ○ For payments of principal that the Federal Reserve receives from maturing Treasury securities, the Committee anticipates that the cap will be $6 billion per month initially and will increase in steps of $6 billion at three-month intervals over 12 months until it reaches $30 billion per month.
  - ○ For payments of principal that the Federal Reserve receives from its holdings of agency debt and mortgage-backed securities, the Committee anticipates that the cap will be $4 billion per month initially and will increase in steps of $4 billion at three-month intervals over 12 months until it reaches $20 billion per month.
  - ○ The Committee also anticipates that the caps will remain in place once they reach their respective maximums so that the Federal Reserve's securities holdings will continue to decline in a gradual and predictable manner until the Committee judges that the Federal Reserve is holding no more securities than necessary to implement monetary policy efficiently and effectively.
- Gradually reducing the Federal Reserve's securities holdings will result in a declining supply of reserve balances. The Committee currently anticipates reducing the quantity of reserve balances, over time, to a level appreciably below that seen in recent years but larger than before the financial crisis; the level will reflect the banking system's demand for reserve balances and the Committee's decisions about how to implement monetary policy most efficiently and effectively in the future. The Committee expects to learn more about the underlying demand for reserves during the process of balance sheet normalization.
- The Committee affirms that changing the target range for the federal funds rate is its primary means of adjusting the stance of monetary policy. However, the Committee would be prepared to resume reinvestment of principal payments received on securities held by the Federal Reserve if a material deterioration in the economic outlook were to warrant a sizable reduction in the Committee's target for the federal funds rate. Moreover, the Committee would be prepared to use its full range of tools, including altering the size and composition of its balance sheet, if future economic conditions were to warrant a more accommodative monetary policy than can be achieved solely by reducing the federal funds rate.

[1] The Committee's Policy Normalization Principles and Plans were adopted on September 16, 2014, and are available at www.federalreserve.gov/monetarypolicy/files/FOMC_PolicyNormalization.pdf. On March 18, 2015, the Committee adopted an addendum to the

Policy Normalization Principles and Plans, which is available at www.federalreserve.gov/monetarypolicy/files/FOMC_PolicyNormalization.20150318.pdf.

Staff Review of the Economic Situation

The information reviewed for the June 13–14 meeting showed that labor market conditions continued to strengthen in recent months and suggested that real gross domestic product (GDP) was expanding at a faster pace in the second quarter than in the first quarter. The 12-month change in overall consumer prices, as measured by the price index for personal consumption expenditures (PCE), slowed a bit further in April; total consumer price inflation and core inflation, which excludes consumer food and energy prices, were both running somewhat below 2 percent. Survey-based measures of longer-run inflation expectations were little changed on balance.

Total nonfarm payroll employment expanded further in April and May, and the average pace of job gains over the first five months of the year was solid. The unemployment rate moved down to 4.3 percent in May; the unemployment rates for African Americans and for Hispanics stepped down but remained above the unemployment rates for Asians and for whites. The overall labor force participation rate declined somewhat, and the share of workers employed part time for economic reasons decreased a little. The rate of private-sector job openings increased in March and April, while the quits rate was little changed and the hiring rate moved down. The four-week moving average of initial claims for unemployment insurance benefits remained at a very low level through early June. Measures of labor compensation continued to rise at moderate rates. Compensation per hour in the nonfarm business sector increased 2¼ percent over the four quarters ending in the first quarter, a bit slower than over the same period a year earlier. Average hourly earnings for all employees increased 2½ percent over the 12 months ending in May, about the same as over the comparable period a year earlier.

Total industrial production rose considerably in April, reflecting gains in manufacturing, mining, and utilities output. Automakers' assembly schedules suggested that motor vehicle production would slow in subsequent months, but broader indicators of manufacturing production, such as the new orders indexes from national and regional manufacturing surveys, pointed to modest gains in factory output over the near term.

Real PCE rose solidly in April after increasing only modestly in the first quarter. Light motor vehicle sales picked up in April but then moved down somewhat in May. The components of the nominal retail sales data used by the Bureau of Economic Analysis to construct its estimate of PCE were flat in May, but estimated increases in these components of sales for the previous two months were revised up. In addition, recent readings on key factors that influence consumer spending pointed to further solid growth in total real PCE in the near term, including continued gains in employment, real disposable personal income, and households' net worth. Moreover, consumer sentiment, as measured by the University of Michigan Surveys of Consumers, remained upbeat in May.

Residential investment appeared to be slowing after increasing briskly in the first quarter. The first-quarter strength may have reflected housing activity shifting earlier in response to unseasonably warm weather last quarter, to an anticipation of higher future interest rates, or to both. Starts of new single-family homes edged up in April, but the issuance of building permits for these homes declined somewhat. Meanwhile, starts of multifamily units fell. Moreover, sales of both new and existing homes decreased in April.

Real private expenditures for business equipment and intellectual property seemed to be increasing further after rising at a solid pace in the first quarter. Both nominal shipments and new orders of nondefense capital goods excluding aircraft rose in April, and new orders continued to exceed shipments, pointing to further gains in shipments in the near term. In addition, indicators of business sentiment were upbeat in recent months. Although firms' nominal spending for nonresidential structures excluding drilling and mining declined in April, the number of oil and gas rigs in operation, an indicator of spending for structures in the drilling and mining sector, continued to rise through early June.

Nominal federal government spending data for April and May pointed to essentially flat real federal purchases in the second quarter. Real state and local government purchases appeared to be moving down, as state and local government payrolls declined, on net, in April and May, and nominal construction expenditures by these governments decreased in April.

The nominal U.S. international trade deficit widened slightly in March, with a small decline in exports and a small increase in imports. The March data, together with revised estimates for earlier months, indicated that real exports grew briskly in the first quarter and at a faster pace than in the second half of 2016. Real imports also increased in the first quarter but at a slower pace than in the second half of 2016. In April, the nominal trade deficit widened, as imports picked up while exports declined slightly. Net exports were estimated to have made a small positive contribution to real GDP growth in the first quarter. However, the April trade data suggested that net exports might be a slight drag on real GDP growth in the second quarter.

Total U.S. consumer prices, as measured by the PCE price index, increased 1¾ percent over the 12 months ending in April. Core PCE price inflation was 1½ percent over those same 12 months. Over the 12 months ending in May, the consumer price index (CPI) rose a little less than 2 percent, while core CPI inflation was 1¾ percent. The median of inflation expectations over the next 5 to 10 years from the Michigan survey was unchanged in May, and the median expectation for PCE price inflation over the next 10 years from the Survey of Professional Forecasters also held steady in the second quarter. Likewise, the medians of longer-run inflation expectations from the Desk's Survey of Primary Dealers and Survey of Market Participants were essentially unchanged in June.

The economic expansions in Canada and the euro area as well as in China and many other emerging market economies (EMEs) continued to firm in the first quarter. In contrast, economic growth in the United Kingdom slowed sharply. Recent indicators suggested that real GDP growth in most foreign economies remained solid in the second quarter. Headline inflation across the advanced foreign economies (AFEs) generally appeared to moderate from the pace registered over the first quarter, as the effects of earlier increases in energy prices started to fade; core inflation continued to be subdued in many AFEs. Among the EMEs, inflation in China rose while inflation in Latin America fell. In Mexico, the effects of fuel price hikes in January and the pass-through from earlier currency depreciation to prices started to wane, but inflation remained above the central bank's target.

Staff Review of the Financial Situation

Domestic financial market conditions remained generally accommodative over the intermeeting period. U.S. equity prices increased over the period, longer-term Treasury yields declined, and the dollar depreciated. A decline in the perceived likelihood of a significant fiscal expansion and the below-expectations reading on the April CPI reportedly contributed to lower yields on longer-tenor Treasury securities. Market participants' perceptions of an improved global economic outlook appeared to provide some support to prices of risk assets.

FOMC communications over the intermeeting period were viewed as broadly in line with investors' expectations that the Committee would continue to remove policy accommodation at a gradual pace. Market participants interpreted the May FOMC statement and the meeting minutes as indicating that the Committee had not materially changed its economic outlook. In response to the discussion of SOMA reinvestment policy in the minutes, a number of market participants reportedly pulled forward their expectations for the most likely timing of a change to the Committee's reinvestment policy, a shift that was evident in the responses to the Desk's Survey of Primary Dealers and Survey of Market Participants. However, investors also reportedly viewed the Committee's planning as mitigating the risk that the process of reducing the size of the Federal Reserve's balance sheet would lead to outsized movements in interest rates or have adverse effects on market functioning.

The probability of an increase in the target range for the federal funds rate occurring at the June meeting, as implied by quotes on federal funds futures contracts, rose to a high level. However, the expected federal funds rate from late 2018 to the end of 2020 implied by OIS quotes declined slightly. Immediately following the May FOMC meeting, nominal Treasury yields rose at short and intermediate maturities, reportedly reflecting the response of investors to a passage in the postmeeting statement indicating the Committee's view that the slowing in real GDP growth during the first quarter was likely to be transitory. Later in the intermeeting period, yields declined in reaction to the release of weaker-than-expected April CPI data and the somewhat disappointing May employment report. On balance, the Treasury yield curve flattened, with short-term yields rising modestly and the 10-year yield declining. Both 5-year and 5-to-10-year-forward TIPS-based inflation compensation declined, in part reflecting the below-expectations inflation data.

Broad U.S. equity price indexes increased. One-month-ahead option-implied volatility on the S&P 500 index—the VIX—was little changed, on net, and remained near the lower end of its historical range.

Conditions in short-term funding markets were stable over the intermeeting period. Yields on a broad set of money market instruments remained in the ranges observed since the FOMC increased the target range for the federal funds rate in March. Term OIS rates rose as expectations firmed for an increase in the federal funds rate target at this meeting.

Financing conditions for nonfinancial businesses continued to be accommodative. Commercial and industrial loans outstanding increased in April and May after being weak in the first quarter, although the growth of these loans remained well below the pace seen a year ago. Issuance of both corporate debt and equity was strong. Gross issuance of institutional leveraged loans was solid in April and May, although it receded from the near-record levels seen over the previous two months.

Commercial real estate (CRE) loans on banks' books grew robustly in April and May, with nonfarm nonresidential loans leading the expansion. However, recent CRE loan growth was a bit slower than that during the first quarter, in part reflecting a slowdown in lending for both construction and multifamily units. Issuance of commercial mortgage-backed securities (CMBS) through the first five months of this year was similar to the issuance over the same period a year earlier. While delinquency rates on CRE loans held by banks edged down further in the first quarter, the delinquency rates on loans in CMBS pools continued to increase. The rise in CMBS delinquency rates was mostly confined to loans that were originated during the period of weak underwriting before the financial crisis. The increase in those delinquencies had generally been expected by market participants and was not anticipated to have a material effect on credit availability or market conditions.

Residential mortgage rates declined slightly, in line with yields on longer-term Treasury and mortgage-backed securities, but remained elevated relative to the third quarter of 2016. Despite the higher level of mortgage rates, growth in mortgage lending for home purchases remained near the upper end of its recent range during the first quarter. Delinquency rates on residential mortgage loans continued to edge down amid robust house price growth and still-tight lending standards for households with low credit scores and hard-to-document incomes.

Financing conditions in consumer credit markets remained generally accommodative, although some indicators pointed to modest reductions in credit availability in recent months. Tighter conditions for credit card borrowing were especially apparent within the subprime segment, where there had been some further deterioration of credit performance. On a year-over-year basis, overall credit card balances continued to grow in April at a robust rate, although the pace had moderated a bit from that of 2016.

Growth in auto loans remained solid through the first quarter. Overall delinquency rates on auto loans continued to be relatively low, but the delinquency rate among subprime borrowers remained elevated, reflecting easier lending standards in 2015 and 2016. Recent evidence suggested that these lending standards had tightened; the credit rating of the average borrower had trended higher, and new extensions of subprime auto loans had declined.

Over the period since the May FOMC meeting, foreign financial markets were influenced by incoming economic data and by political developments both abroad and in the United States. Most AFE and EME equity indexes edged higher, supported by robust first-quarter earnings reports and generally positive data releases overseas. The broad U.S. dollar depreciated about 1¾ percent over the intermeeting period, weakening against both AFE and EME currencies. In particular, the dollar depreciated against the Canadian dollar following communications by the Bank of Canada suggesting that the removal of policy accommodation could occur sooner than previously expected by market participants. The dollar also depreciated against the euro, which was supported by the results of the French presidential election and by stronger-than-expected macroeconomic releases. Those data releases prompted the European Central Bank at its June 8 meeting to change its assessment of risks to the economic outlook from "tilted to the downside" to "balanced." U.S. developments, including mixed economic data reports, also weighed on the dollar. In contrast, the dollar strengthened against sterling following the U.K. parliamentary election. Changes in longer-dated AFE sovereign bond yields were mixed, while shorter-dated yields moved slightly higher. EME sovereign spreads were little changed, while flows into EME mutual funds remained robust. However, Brazilian sovereign spreads widened and the Brazilian *real* depreciated notably amid increased political uncertainty.

Staff Economic Outlook

In the U.S. economic projection prepared by the staff for the June FOMC meeting, real GDP growth was forecast to step up to a solid pace in the second quarter following its weak reading in the first quarter, primarily reflecting faster real PCE growth. On balance, the incoming data on aggregate spending were a little stronger than the staff had expected, and the forecast of real GDP growth for the current year was a bit higher than in the previous projection. Beyond this year, the projection for real GDP growth was essentially unchanged. The staff continued to project that real GDP would expand at a modestly faster pace than potential output in 2017 through 2019, supported in part by the staff's maintained assumption that fiscal policy would become more expansionary in the coming years. The unemployment rate was projected to decline gradually over the next couple of years and to continue running below the staff's estimate of its longer-run natural rate over this period.

The staff's forecast for consumer price inflation, as measured by the change in the PCE price index, was revised down slightly for 2017 because of the weaker-than-expected incoming data for inflation. However, the projection was little changed thereafter, as the recent weakness in inflation was viewed as transitory. Inflation was still expected to be somewhat higher this year than last year, largely reflecting an upturn in the prices for food and non-energy imports. The staff projected that inflation would increase further in the next couple of years, and that it would be close to the Committee's longer-run objective in 2018 and at 2 percent in 2019.

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. Many financial market indicators of uncertainty were subdued, and the uncertainty associated with the foreign outlook appeared to have subsided further, on balance, since late last year; these developments were judged as counterweights to elevated measures of economic policy uncertainty. The staff saw the risks to the forecasts for real GDP and the unemployment rate as balanced; the staff's assessment was that the downside risks associated with monetary policy not being well positioned to respond to adverse shocks had diminished since its previous forecast. The risks to the projection for inflation also were seen as roughly balanced. The downside risks from the possibility that longer-term inflation expectations may have edged down or that the dollar could appreciate substantially were seen as essentially counterbalanced by the upside risk that inflation could increase more than expected in an economy that was projected to continue operating above its longer-run potential.

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 output growth, the unemployment rate, and inflation for each year from 2017 through 2019 and over the longer run, based on their individual assessments of the appropriate path for the federal funds rate.[4] 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.[5] These projections and policy assessments are described in the Summary of Economic Projections (SEP), which is an addendum to these minutes.

In their discussion of the economic situation and the outlook, meeting participants agreed that the information received over the intermeeting period indicated that the labor market had continued to strengthen and that economic activity had been rising moderately, on average, so far this year. Job gains had moderated since the beginning of the year but had remained solid, on average, and the unemployment rate had declined. Household spending had picked up in recent months, and business fixed investment had continued to expand. Inflation measured on a 12-month basis had declined recently and, like the measure excluding food and energy prices, had been running somewhat below 2 percent. Market-based measures of inflation compensation remained low; survey-based measures of longer-term inflation expectations were little changed on balance.

Participants generally saw the incoming information on spending and labor market indicators as consistent, overall, with their expectations and indicated that their views of the outlook for economic growth and the labor market had changed only slightly since the May FOMC meeting. As anticipated, growth in consumer spending seemed to have bounced back from a weak first quarter, and participants continued to expect that, with further gradual adjustments in the stance of monetary policy, economic activity would expand at a moderate pace and labor market conditions would strengthen somewhat further. In light of surprisingly low recent readings on inflation, participants expected that inflation on a 12-month basis would remain somewhat below 2 percent in the near term. However, participants judged that

[4] Four members of the Board of Governors, one fewer than in March 2017, were in office at the time of the June 2017 meeting and submitted economic projections. The office of the president of the Federal Reserve Bank of Richmond was vacant at the time of this FOMC meeting; First Vice President Mark L. Mullinix submitted economic projections.

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

inflation would stabilize around the Committee's 2 percent objective over the medium term.

Growth in consumer spending appeared to be rebounding after slowing in the first quarter of this year. Participants generally continued to expect that ongoing job gains, rising household income and wealth, and improved household balance sheets would support moderate growth in household spending over the medium term. However, District contacts reported that automobile sales had slowed recently; some contacts expected sales to slow further, while others believed that sales were leveling out.

Participants generally agreed that business fixed investment had continued to expand in recent months, supported in particular by a rebound in the energy sector. District contacts suggested that an expansion in oil production capacity was likely to continue in the near term, though the longer-term outlook was more uncertain. Conditions in the manufacturing sector in several Districts were reportedly strong, but activity in a couple of them had slowed in recent months from a high level, and some contacts in the automobile industry reported declines in production that they expected to continue in the near term. District reports regarding the service sector were generally positive. In contrast, contacts in a couple of Districts indicated that conditions in the agricultural sector remained weak. Contacts in many Districts remained optimistic about business prospects, which were supported in part by improving global conditions. However, this optimism appeared to have recently abated somewhat, partly because contacts viewed the likelihood of significant fiscal stimulus as having diminished. Contacts at some large firms indicated that they had curtailed their capital spending, in part because of uncertainty about changes in fiscal and other government policies; some contacts at smaller firms, however, indicated that their capital spending plans had not been appreciably affected by news about government policy. Reports regarding housing construction from District contacts were mixed.

Labor market conditions continued to strengthen in recent months. The unemployment rate fell from 4.5 percent in March to 4.3 percent in May and was below levels that participants judged likely to be normal over the longer run. Monthly increases in nonfarm payrolls averaged 160,000 since the beginning of the year, down from 187,000 per month in 2016 but still well above estimates of the pace necessary to absorb new entrants in the labor force. A few participants interpreted this slowing in payroll growth as an expected development that reflected a tight labor market. Other labor market indicators, such as the number of job openings and broader measures of unemployment, were also seen as consistent with labor market conditions having strengthened in recent months. Moreover, contacts in several Districts reported shortages of workers in selected occupations and in some cases indicated that firms were significantly increasing salaries and benefits in order to attract or keep workers. However, other contacts reported only modest wage gains, and participants observed that measures of labor compensation for the overall economy continued to rise only moderately despite strengthening labor market conditions. A couple of participants saw the restrained increases in labor compensation as consistent with the low productivity growth and moderate inflation experienced in recent years. In light of the recent behavior of labor compensation and consumer prices as well as demographic trends, a number of participants lowered their estimate of the longer-run normal level of the unemployment rate.

Recent readings on headline and core PCE price inflation had come in lower than participants had expected. On a 12-month basis, headline PCE price inflation was running somewhat below the Committee's 2 percent objective in April, partly because of factors that appeared to be transitory. Core PCE price inflation—which historically has been a more useful predictor of future inflation, although it, too, can be affected by transitory factors—moved down from 1.8 percent in March to 1.5 percent in April. In addition, CPI inflation in May came in lower than expected. Most participants viewed the recent softness in these price data as largely reflecting idiosyncratic factors, including sharp declines in prices of wireless telephone services and prescription drugs, and expected these developments to have little bearing on inflation over the medium run. Participants continued to expect that, as the effects of transitory factors waned and labor market conditions strengthened further, inflation would stabilize around the Committee's 2 percent objective over the medium term. Several participants suggested that recent increases in import prices were consistent with this expectation. However, several participants expressed concern that progress toward the Committee's 2 percent longer-run inflation objective might have slowed and that the recent softness in inflation might persist. Such persistence might occur in part because upward pressure on inflation from resource utilization may be limited, as the relationship between these two variables appeared to be weaker than in previous decades. However, a couple of other participants raised the concern that a tighter relationship between inflation and resource utilization could reemerge if the unemployment rate ran significantly below its longer-run normal level, which could result in inflation running persistently above the Committee's 2 percent objective.

Overall, participants continued to see the near-term risks to the economic outlook as roughly balanced. Participants again noted the uncertainty regarding the possible enactment, timing, and nature of changes to fiscal and other government policies and saw both upside and downside risks to the economic outlook associated with such changes. A number of participants, pointing to improved prospects for foreign economic growth, viewed the downside risks to the U.S. economic outlook stemming from international developments as having receded further over the intermeeting period. With regard to the outlook for inflation, some participants emphasized downside risks, particularly in light of the recent low readings on inflation along with measures of inflation compensation and some survey measures of inflation expectations that were still low. However, a couple of participants expressed concern that a substantial undershooting of the longer-run normal rate of unemployment could pose an appreciable upside risk to inflation or give rise to macroeconomic or financial imbalances that eventually could lead to a significant economic downturn. Participants agreed that the Committee should continue to monitor inflation developments closely.

In their discussion of recent developments in financial markets, participants observed that, over the intermeeting period, equity prices rose, longer-term interest rates declined, and volatility in financial markets was generally low. They also noted that, according to some measures, financial conditions had eased even as the Committee reduced policy accommodation and market participants continued to expect further steps to tighten monetary policy. Participants discussed possible reasons why financial conditions had not tightened. Corporate earnings growth had been robust; nevertheless, in the assessment of a few participants, equity prices were high when judged against standard valuation measures. Longer-term Treasury yields had declined since earlier in the year and remained low. Participants offered various explanations for low bond yields, including the prospect of sluggish longer-term economic growth as well as the elevated level of the Federal Reserve's longer-term asset holdings. Some participants suggested that increased risk tolerance among investors might be contributing to elevated asset prices more broadly; a few participants expressed concern that subdued market volatility, coupled with a low equity premium, could lead to a buildup of risks to financial stability.

In their discussion of monetary policy, participants generally saw the outlook for economic activity and the medium-term outlook for inflation as little changed and viewed a continued gradual removal of monetary policy accommodation as being appropriate. Based on this assessment, almost all 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. These participants agreed that, even after an increase in the target range for the federal funds rate at this meeting, the stance of monetary policy would remain accommodative, supporting additional strengthening in labor market conditions and a sustained return to 2 percent inflation. A few participants also judged that the case for a policy rate increase at this meeting was strengthened by the easing, by some measures, in overall financial conditions over the previous six months. One participant did not believe it was appropriate to raise the federal funds rate target range at this meeting; this participant suggested that the Committee should maintain the target range for the federal funds rate at ¾ to 1 percent until the inflation rate was actually moving toward the Committee's 2 percent longer-run objective.

Participants noted that, with the process of normalization of the level of the federal funds rate continuing, it would likely become appropriate this year for the Committee to announce and implement a specific timetable for its program of reducing reinvestment of the Federal Reserve's securities holdings. It was observed that the ensuing reduction in securities holdings would be gradual and would follow an extended period of Committee communications on balance sheet normalization policy, including the information that would be released at the conclusion of this meeting. Consequently, the effect on financial market conditions of the eventual announcement of the beginning of the Federal Reserve's balance sheet normalization was expected to be limited.

Participants expressed a range of views about the appropriate timing of a change in reinvestment policy. Several preferred to announce a start to the process within a couple of months; in support of this approach, it was noted that the Committee's communications had helped prepare the public for such a step. However, some others emphasized that deferring the decision until later in the year would permit additional time to assess the outlook for economic activity and inflation. A few of these participants also suggested that a near-term change to reinvestment policy could be misinterpreted as signifying that the Committee had shifted toward a less gradual approach to overall policy normalization.

Several participants indicated that the reduction in policy accommodation arising from the commencement of balance sheet normalization was one basis for believing that, if economic conditions evolved broadly as anticipated, the target range for the federal funds rate would follow a less steep path than it otherwise would. However, some other participants suggested that they did not see the balance sheet normalization program as a factor likely to figure heavily in decisions about the target range for the federal funds rate. A few of these participants judged that the degree of additional policy firming that would result from the balance sheet normalization program was modest.

Participants generally reiterated their support for continuing a gradual approach to raising the federal funds rate. Several participants expressed confidence that a series of further increases in the federal funds rate in coming years, along the lines implied by the medians of the projections for the federal funds rate in the June SEP, would contribute to a stabilization, over the medium term, of the inflation rate around the Committee's 2 percent objective, especially as this tightening of monetary policy would affect the economy only with a lag and would start from a point at which policy was still accommodative. However, a few participants who supported an increase in the target range at the present meeting indicated that they were less comfortable with the degree of additional policy tightening through the end of 2018 implied by the June SEP median federal funds rate projections. These participants expressed concern that such a path of increases in the policy rate, while gradual, might prove inconsistent with a sustained return of inflation to 2 percent.

Several participants endorsed a policy approach, such as that embedded in many participants' projections, in which the unemployment rate would undershoot their current estimates of the longer-term normal rate for a sustained period. They noted that the longer-run normal rate of unemployment is difficult to measure and that recent evidence suggested resource pressures generated only modest responses of nominal wage growth and inflation. Against this backdrop, possible benefits cited by policymakers of a period of tight labor markets included a further rise in nominal wage growth that would bolster inflation expectations and help push the inflation rate closer to the Committee's 2 percent longer-run goal, as well as a stimulus to labor market participation and business fixed investment. It was also suggested that the symmetry of the Committee's inflation goal might be underscored if inflation modestly exceeded 2 percent for a time, as such an outcome would follow a long period in which inflation had undershot the 2 percent longer-term objective. Several participants expressed concern that a substantial and sustained unemployment undershooting might make the economy more likely to experience financial instability or could lead to a sharp rise in inflation that would require a rapid policy tightening that, in turn, could raise the risk of an economic downturn. However, other participants noted that if a sharp rise in inflation or inflation expectations did occur, the Committee could readily respond using conventional monetary policy tools. With regard to financial stability, one participant emphasized the importance of remaining vigilant about financial developments but observed that previous episodes of elevated financial imbalances and low unemployment had limited relevance for the present situation, as the current system of financial regulation was likely more robust than that prevailing before the financial crisis.

Committee Policy Action

In their discussion of monetary policy for the period ahead, members judged that information received since the Federal Open Market Committee met in May indicated that the labor market had continued to strengthen and that economic activity had been rising moderately so far this year. Job gains had moderated but had been solid, on average, since the beginning of the year, and the unemployment rate had declined. Household spending had picked up in recent months, and business fixed investment had continued to expand.

Inflation on a 12-month basis had declined recently and was running somewhat below 2 percent. The measure of inflation excluding food and energy prices was likewise running somewhat below 2 percent. Market-based measures of inflation compensation remained low; survey-based measures of longer-term inflation expectations had changed little on balance.

With respect to the economic outlook and its implications for monetary policy, members continued to expect that, with gradual adjustments in the stance of monetary policy, economic activity would expand at a moderate pace, and labor market conditions would strengthen somewhat further. Inflation on a 12-month basis was expected to remain somewhat below 2 percent in the near term, but almost all members expected it to stabilize around 2 percent over the medium term, although they were monitoring inflation developments closely. Members continued to judge that there was significant uncertainty about the effects of possible changes in fiscal and other government policies but that near-term risks to the economic outlook appeared roughly balanced, especially as risks related to foreign economic and financial developments had diminished.

After assessing current conditions and the outlook for economic activity, the labor market, and inflation, all but one member agreed to raise the target range for the federal funds rate to 1 to 1¼ percent. They noted that the stance of monetary policy remained accommodative, thereby supporting some further strengthening in labor market conditions and a sustained return to 2 percent inflation.

Members agreed that, in determining the timing and size of future adjustments to the target range for the federal funds rate, the Committee would assess realized and expected economic conditions relative to its objectives of maximum employment and 2 percent inflation. 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. Members also agreed that they would carefully monitor actual and expected developments in inflation in relation to the Committee's symmetric inflation goal. They expected that economic conditions would evolve in a manner that would warrant gradual increases in the federal funds rate, and they agreed that the federal funds rate was likely to remain, for some time, below levels that are expected to prevail in the longer run. However, the actual path of the federal funds rate would depend on the economic outlook as informed by incoming data.

The Committee also decided to maintain its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at auction. The Committee expected to begin implementing a balance sheet normalization program in 2017, provided that the economy evolves broadly as anticipated. This program, which would gradually reduce the Federal Reserve's securities holdings by decreasing reinvestment of principal payments from those securities, was described in an addendum to the Committee's Policy Normalization Principles and Plans to be released after this meeting.

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

> "Effective June 15, 2017, 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 1 to 1¼ 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 1.00 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 maturing Treasury securities at auction and to continue reinvesting principal payments on all agency debt and agency mortgage-backed securities in agency mortgage-backed securities. The Committee also directs the Desk to engage in dollar roll and coupon swap transactions as necessary to facilitate settlement of the Federal Reserve's agency mortgage-backed securities transactions."

The 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 May indicates that the labor market has continued to strengthen and that economic activity has been rising moderately so far this year. Job gains have moderated but have been solid, on average, since the beginning of the year, and the unemployment rate has declined. Household spending has picked up in recent months, and business fixed investment has continued to expand. On a 12-month basis, inflation has declined recently and, like the measure excluding food and energy prices, is running somewhat below 2 percent. Market-based measures of inflation compensation remain low; survey-based measures 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 continues to expect that, with gradual adjustments in the stance of monetary policy, economic activity will expand at a moderate pace, and labor market conditions will strengthen somewhat further. Inflation on a 12-month basis is expected to remain somewhat below 2 percent in the near term but to stabilize around the Committee's 2 percent objective over the medium term. Near-term risks to the economic outlook appear roughly balanced, but the Committee is monitoring inflation developments closely.

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 1 to 1¼ percent. The stance of monetary policy remains accommodative, thereby supporting some further strengthening in labor market conditions and a sustained return to 2 percent inflation.

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 objectives of maximum employment and 2 percent inflation. This assessment will take into account a wide range of information, including measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial and international developments. The Committee will carefully monitor actual and expected inflation developments relative to its symmetric inflation goal. The Committee expects that economic conditions will evolve in a manner that will warrant gradual increases in the federal funds rate; the federal funds rate is likely to remain, for some time, below levels that are expected to prevail in the longer run. However, the actual path of the federal funds rate will depend on the economic outlook as informed by incoming data.

The Committee is maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at auction. The Committee currently expects to begin implementing a balance sheet normalization program this year, provided that the economy evolves broadly as anticipated. This program, which would gradually reduce the Federal Reserve's securities holdings by decreasing reinvestment of principal payments from those securities, is described in the accompanying addendum to the Committee's Policy Normalization Principles and Plans."

Voting for this action: Janet L. Yellen, William C. Dudley, Lael Brainard, Charles L. Evans, Stanley Fischer, Patrick Harker, Robert S. Kaplan, and Jerome H. Powell.

Voting against this action: Neel Kashkari.

Mr. Kashkari dissented because he preferred to maintain the existing target range for the federal funds rate at this meeting. In his view, recent data, while suggesting that the labor market had improved further, had increased doubts about achievement of the Committee's 2 percent longer-run inflation objective and thus had not provided a compelling basis on which to firm monetary policy at this meeting. He preferred to await additional evidence that the recent decline in inflation was temporary and that inflation was moving toward the Committee's symmetric 2 percent inflation objective. He was concerned that raising the federal funds rate target range too soon increased the likelihood that inflation expectations would decline and that inflation would continue to run below 2 percent.

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 ¼ percentage point, to 1¼ percent, effective June 15, 2017. The Board of Governors also voted unanimously to approve a ¼ percentage point increase in the primary credit rate (discount rate) to 1¾ percent, effective June 15, 2017.[6]

[6] In taking this action, the Board approved requests submitted by the boards of directors of the Federal Reserve Banks of Boston, Philadelphia, Cleveland, Richmond, Atlanta, Chicago, Kansas City, Dallas, and San Francisco. This vote also encompassed approval by the Board of Governors of the establishment of a 1¾ percent primary credit rate by the remaining Federal Reserve Banks, effective on the later of June 15, 2017, 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, St. Louis, and Minneapolis were informed by the Secretary of the Board of the

It was agreed that the next meeting of the Committee would be held on Tuesday–Wednesday, July 25–26, 2017. The meeting adjourned at 10:35 a.m. on June 14, 2017.

Notation Vote

By notation vote completed on May 23, 2017, the Committee unanimously approved the minutes of the Committee meeting held on May 2–3, 2017.

Brian F. Madigan
Secretary

Board's approval of their establishment of a primary credit rate of 1¾ percent, effective June 15, 2017.) 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 June 13–14, 2017, meeting participants submitted their projections of the most likely outcomes for real output growth, the unemployment rate, and inflation for each year from 2017 to 2019 and over the longer run.[1] Each participant's projection was 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.[2] 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.[3] "Appropriate monetary policy" is defined as the future path of policy that each participant deems most likely to foster outcomes for economic activity and inflation that best satisfy his or her individual interpretation of the Federal Reserve's objectives of maximum employment and stable prices.

All participants who submitted longer-run projections expected that, under appropriate monetary policy, growth in real gross domestic product (GDP) this year would run somewhat above their individual estimates of its longer-run rate. Over half of these participants expected that economic growth would slow a bit in 2018, and almost all of them expected that in 2019 economic growth would run at or near its longer-run level. All participants who submitted longer-run projections expected that the unemployment rate would run below their estimates of its longer-run normal level in 2017 and remain below that level through 2019. The majority of participants also lowered their estimates of the longer-run normal rate of unemployment by 0.1 to 0.2 percentage point. All participants projected that inflation, as measured by the four-quarter percentage change in the price index for personal consumption expenditures (PCE), would run below 2 percent in 2017 and then step up in the next two years; over half of them projected that inflation would be at the Committee's 2 percent objective in 2019, and all judged that inflation would be within a couple of tenths of a percentage point of the objective in that year. Table 1 and figure 1 provide summary statistics for the projections.

As shown in figure 2, participants generally expected that evolving economic conditions would likely warrant further gradual increases in the federal funds rate to achieve and sustain maximum employment and 2 percent inflation. Although some participants raised or lowered their federal funds rate projections since March, the median projections for the federal funds rate in 2017 and 2018 were essentially unchanged, and the median projection in 2019 was slightly lower; the median projection for the longer-run federal funds rate was unchanged. However, the economic outlook is uncertain, and participants noted that their economic projections and assessments of appropriate monetary policy could change in response to incoming information.

In general, participants viewed the uncertainty attached to their projections as broadly similar to the average of the past 20 years, although a couple of participants saw the uncertainty associated with their real GDP growth forecasts as higher than average. Most participants judged the risks around their projections for economic growth, the unemployment rate, and inflation as broadly balanced.

Figures 4.A through 4.C for real GDP growth, the unemployment rate, and inflation, respectively, present "fan charts" as well as charts of participants' current assessments of the uncertainty and risks surrounding the economic projections. The fan charts (the panels at the top of these three figures) show the median projections surrounded by confidence intervals that are computed from the forecast errors of various private and government projections made over the past 20 years. The width of the confidence interval for each variable at a given point is a measure of forecast uncertainty at that horizon. For all three macroeconomic variables, these charts illustrate that forecast uncertainty is substantial and generally increases as the forecast horizon lengthens.

[1] Four members of the Board of Governors, one fewer than in March 2017, were in office at the time of the June 2017 meeting and submitted economic projections. The office of the president of the Federal Reserve Bank of Richmond was vacant at the time of this FOMC meeting; First Vice President Mark L. Mullinix submitted economic projections.

[2] All participants submitted their projections in advance of the FOMC meeting; no projections were revised following the release of economic data on the morning of June 14.

[3] One participant did not submit longer-run projections for real output 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, June 2017

Percent

Variable	Median[1]				Central tendency[2]				Range[3]			
	2017	2018	2019	Longer run	2017	2018	2019	Longer run	2017	2018	2019	Longer run
Change in real GDP	2.2	2.1	1.9	1.8	2.1 – 2.2	1.8 – 2.2	1.8 – 2.0	1.8 – 2.0	2.0 – 2.5	1.7 – 2.3	1.4 – 2.3	1.5 – 2.2
March projection	2.1	2.1	1.9	1.8	2.0 – 2.2	1.8 – 2.3	1.8 – 2.0	1.8 – 2.0	1.7 – 2.3	1.7 – 2.4	1.5 – 2.2	1.6 – 2.2
Unemployment rate	4.3	4.2	4.2	4.6	4.2 – 4.3	4.0 – 4.3	4.1 – 4.4	4.5 – 4.8	4.1 – 4.5	3.9 – 4.5	3.8 – 4.5	4.5 – 5.0
March projection	4.5	4.5	4.5	4.7	4.5 – 4.6	4.3 – 4.6	4.3 – 4.7	4.7 – 5.0	4.4 – 4.7	4.2 – 4.7	4.1 – 4.8	4.5 – 5.0
PCE inflation	1.6	2.0	2.0	2.0	1.6 – 1.7	1.8 – 2.0	2.0 – 2.1	2.0	1.5 – 1.8	1.7 – 2.1	1.8 – 2.2	2.0
March projection	1.9	2.0	2.0	2.0	1.8 – 2.0	1.9 – 2.0	2.0 – 2.1	2.0	1.7 – 2.1	1.8 – 2.1	1.8 – 2.2	2.0
Core PCE inflation[4]	1.7	2.0	2.0		1.6 – 1.7	1.8 – 2.0	2.0 – 2.1		1.6 – 1.8	1.7 – 2.1	1.8 – 2.2	
March projection	1.9	2.0	2.0		1.8 – 1.9	1.9 – 2.0	2.0 – 2.1		1.7 – 2.0	1.8 – 2.1	1.8 – 2.2	
Memo: Projected appropriate policy path												
Federal funds rate	1.4	2.1	2.9	3.0	1.1 – 1.6	1.9 – 2.6	2.6 – 3.1	2.8 – 3.0	1.1 – 1.6	1.1 – 3.1	1.1 – 4.1	2.5 – 3.5
March projection	1.4	2.1	3.0	3.0	1.4 – 1.6	2.1 – 2.9	2.6 – 3.3	2.8 – 3.0	0.9 – 2.1	0.9 – 3.4	0.9 – 3.9	2.5 – 3.8

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 March projections were made in conjunction with the meeting of the Federal Open Market Committee on March 14–15, 2017. 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 March 14–15, 2017, meeting, and one participant did not submit such projections in conjunction with the June 13–14, 2017, meeting.

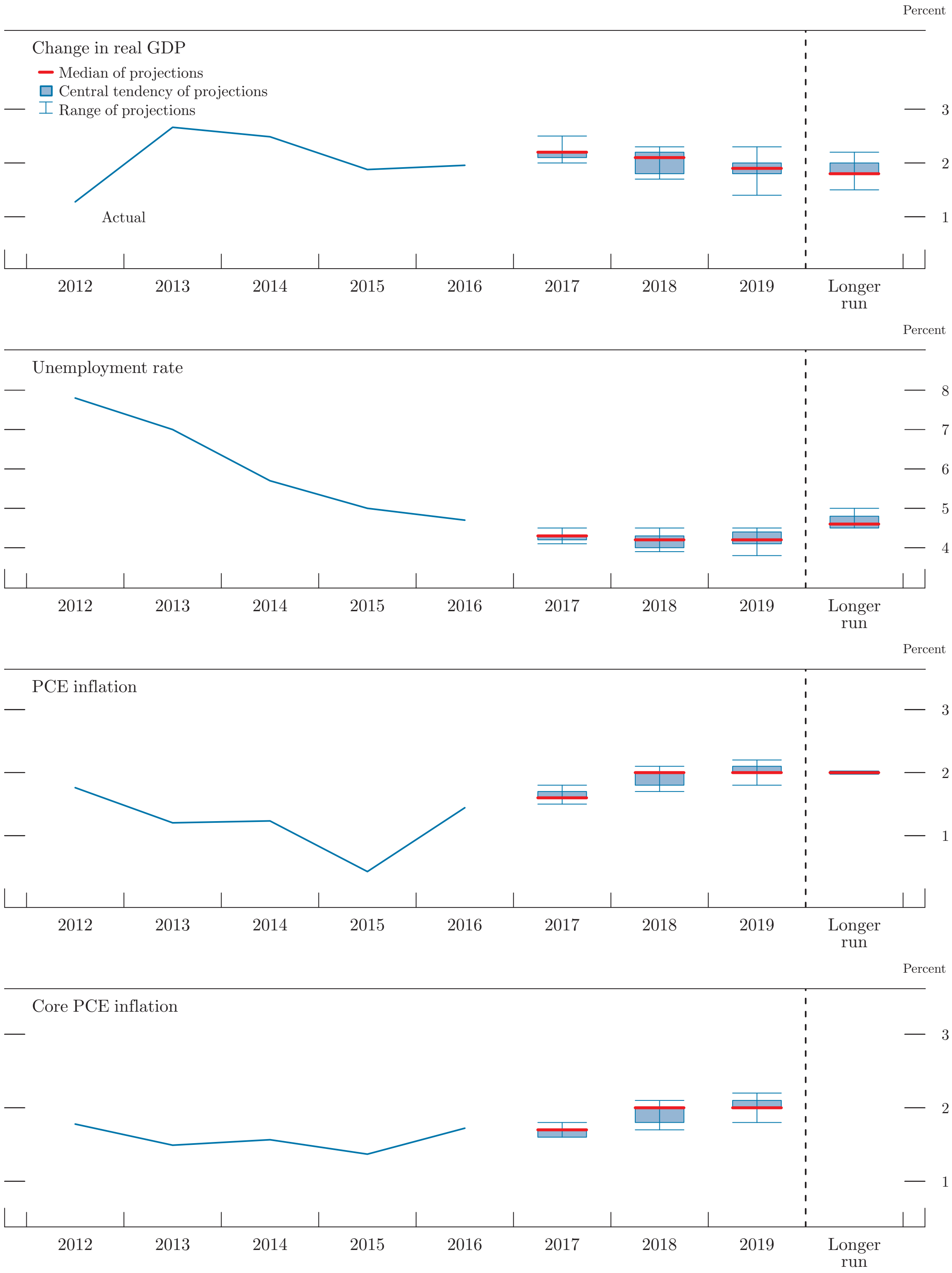
[1] For each period, the median is the middle projection when the projections are arranged from lowest to highest. When the number of projections is even, the median is the average of the two middle projections.

[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, 2017–19 and over the longer run



Change in real GDP

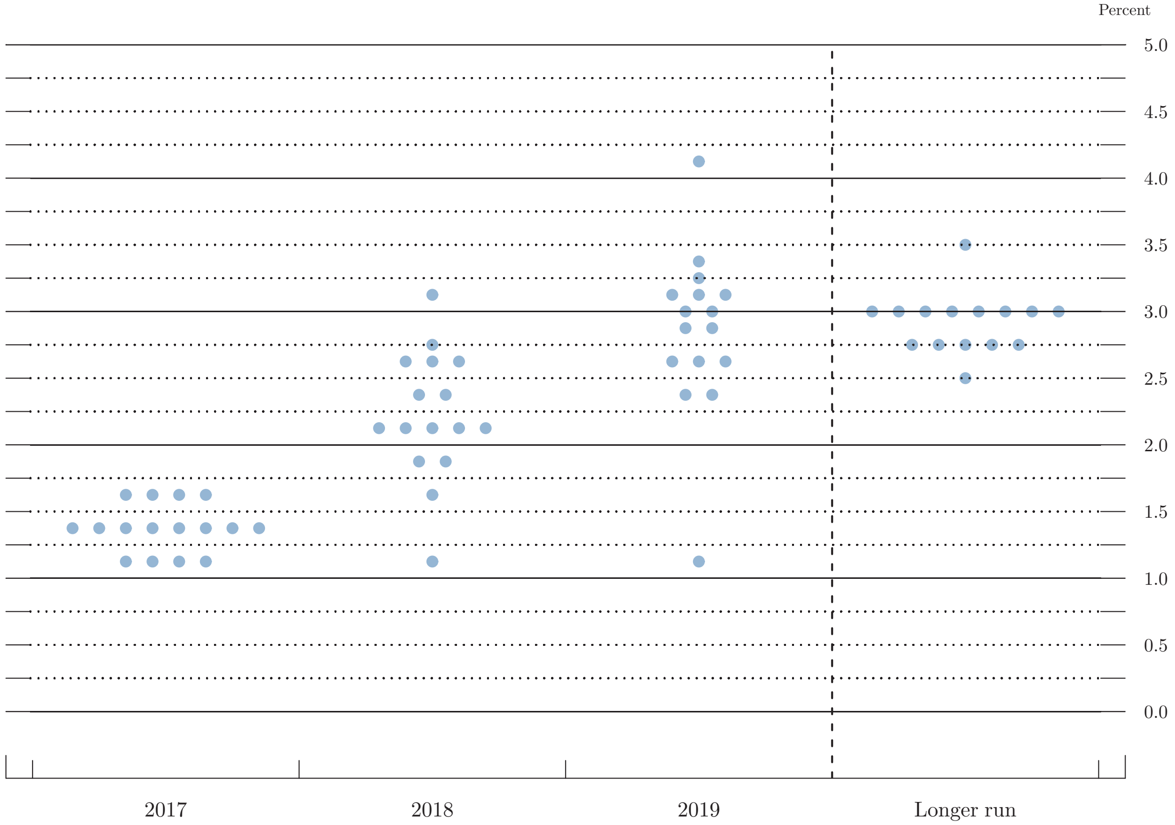
Unemployment rate

PCE inflation

Core PCE inflation

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.

Reflecting, in part, the uncertainty about the future evolution of GDP growth, the unemployment rate, and inflation, participants' assessments of appropriate monetary policy are also subject to considerable uncertainty. To illustrate the uncertainty regarding the appropriate path for monetary policy, figure 5 shows a comparable fan chart around the median projections for the federal funds rate.[4] As with the macroeconomic variables, forecast uncertainty for the federal funds rate is substantial and increases at longer horizons.

The Outlook for Economic Activity

The median of participants' projections for the growth rate of real GDP, conditional on their individual assumptions about appropriate monetary policy, was 2.2 percent in 2017, 2.1 percent in 2018, and 1.9 percent in 2019; the median of projections for the longer-run normal rate of real GDP growth was 1.8 percent. Compared with the March Summary of Economic Projections (SEP), the medians of the forecasts for real GDP growth over the period from 2017 to 2019, as well as the median assessment of the longer-run growth rate, were mostly unchanged. Fewer than half of the participants incorporated expectations of fiscal stimulus into their projections, and a couple indicated that they had marked down the magnitude of expected fiscal stimulus relative to March.

All participants revised down their projections for the unemployment rate in the fourth quarter of 2017 and of 2018, and almost all also revised down their projections for the unemployment rate in the fourth quarter of 2019. Many who did so cited recent lower-than-expected readings on unemployment. The median of the projections for the unemployment rate was 4.3 percent in 2017 and 4.2 percent in each of 2018 and 2019, 0.2 percentage point and 0.3 percentage point lower than in the March projections, respectively. The majority of participants also revised down their estimates of the longer-run normal rate of unemployment by 0.1 or 0.2 percentage point, and the median longer-run level was 4.6 percent, down 0.1 percentage point from March.

Figures 3.A and 3.B show the distributions of participants' projections for real GDP growth and the unemployment rate from 2017 to 2019 and in the longer run. The distribution of individual projections for real GDP growth for this year shifted up, with some participants now expecting real GDP growth between 2.4 and 2.5 percent and none seeing it below 2 percent. The distributions of projected real GDP growth in 2018, 2019, and in the longer run were broadly similar to the distributions of the March projections. The distributions of individual projections for the unemployment rate shifted down noticeably for 2017 and 2018. Most participants projected an unemployment rate of 4.2 or 4.3 percent at the end of this year, and the majority anticipated an unemployment rate between 4.0 and 4.3 percent at the end of 2018. Participants' projections also shifted down in 2019 but were more dispersed than the distributions of their projected unemployment rates in the two earlier years. The distribution of projections for the longer-run normal unemployment rate shifted down modestly.

The Outlook for Inflation

The median of projections for headline PCE price inflation this year was 1.6 percent, down 0.3 percentage point from March. As in March, median projected inflation was 2.0 percent in 2018 and 2019. About half of the participants anticipated that inflation would continue to run a bit below 2 percent in 2018, while only one participant expected inflation above 2 percent in that year—and, in that case, just modestly so. More than half projected that inflation would be equal to the Committee's objective in 2019. A few participants projected that inflation would run slightly below 2 percent in that year, while several projected that it would run a little above 2 percent. The median of projections for core PCE price inflation was 1.7 percent in 2017, a decline of 0.2 percentage point from March; the median projection for 2018 and 2019 was 2.0 percent, as in the March projections.

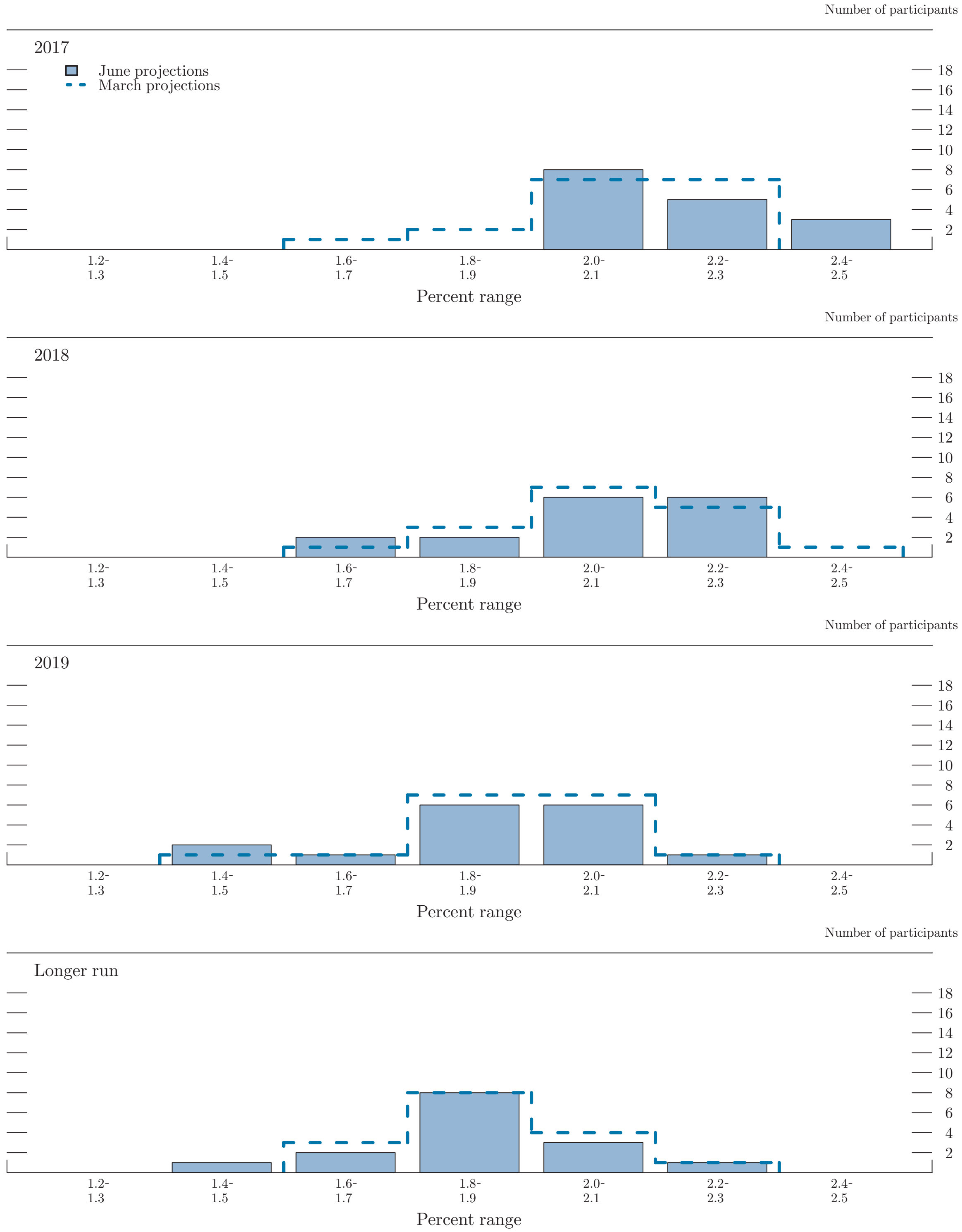
Figures 3.C and 3.D provide information on the distributions of participants' views about the outlook for inflation. The distributions of projections for headline PCE price inflation and for core PCE price inflation in 2017 shifted down noticeably from March, while the distributions for both measures of inflation in 2018 shifted down slightly. Many participants cited recent surprisingly low readings on inflation as a factor contributing to the revisions in their inflation forecasts.

Appropriate Monetary Policy

Figure 3.E provides the distribution of participants' judgments regarding the appropriate target or midpoint of the target range for the federal funds rate at the end

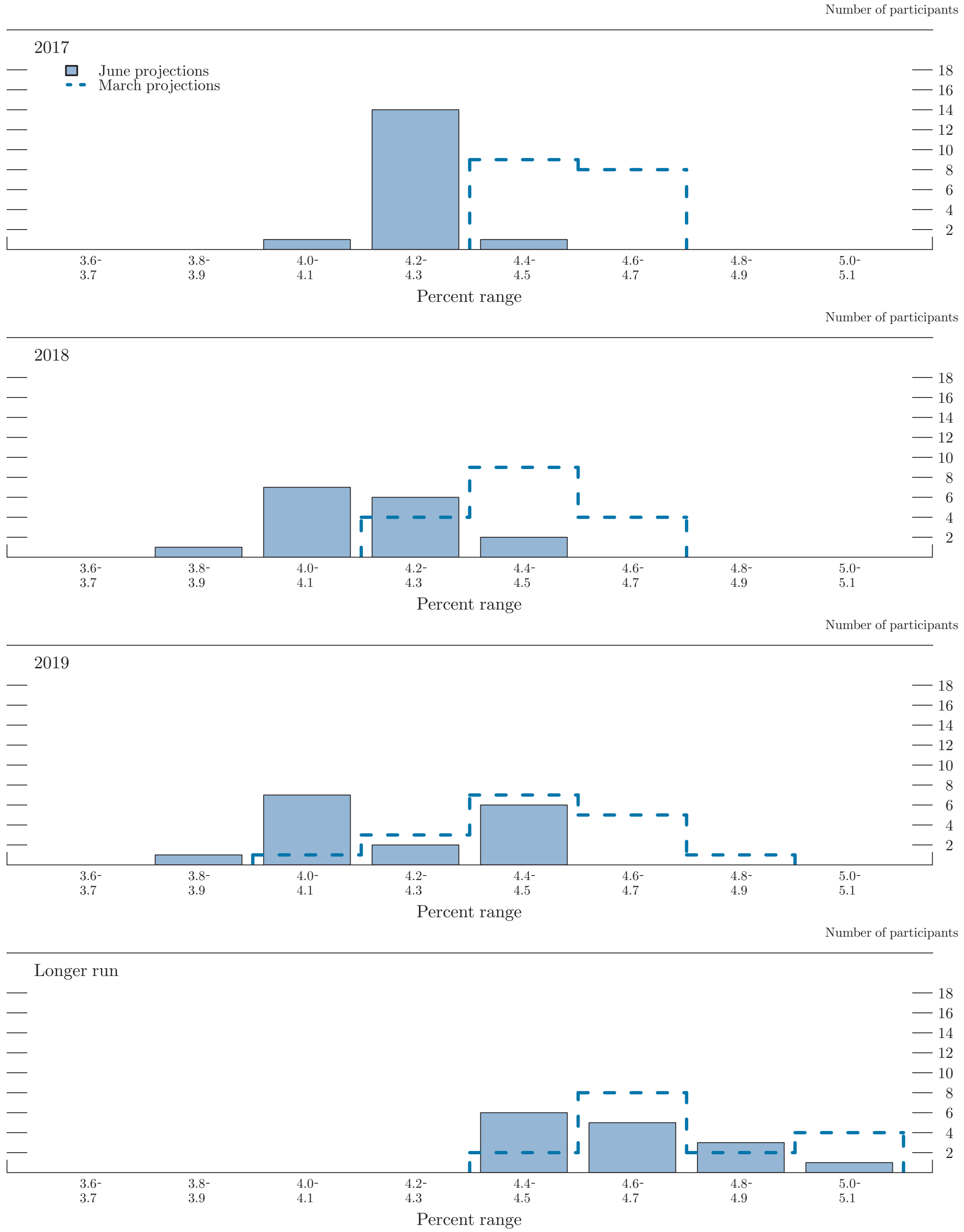
[4] The fan chart for the federal funds rate depicts the uncertainty about the future path of appropriate monetary policy and is closely connected with the uncertainty about the future value of economic variables. In contrast, the dot plot shown in figure 2 displays the dispersion of views across individual participants about the appropriate level of the federal funds rate.

Figure 3.A. Distribution of participants' projections for the change in real GDP, 2017–19 and over the longer run



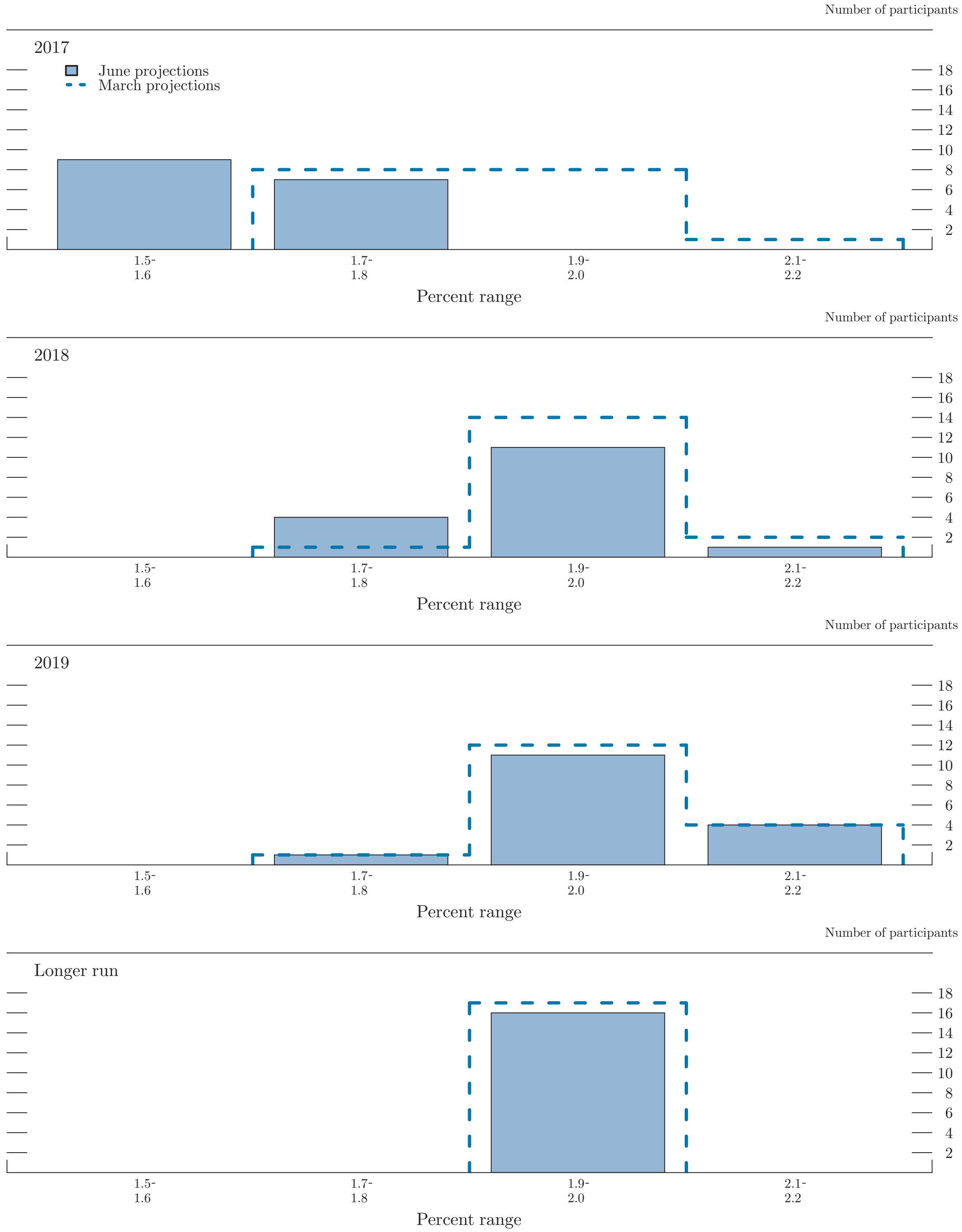
NOTE: Definitions of variables and other explanations are in the notes to table 1.

Figure 3.B. Distribution of participants' projections for the unemployment rate, 2017–19 and over the longer run



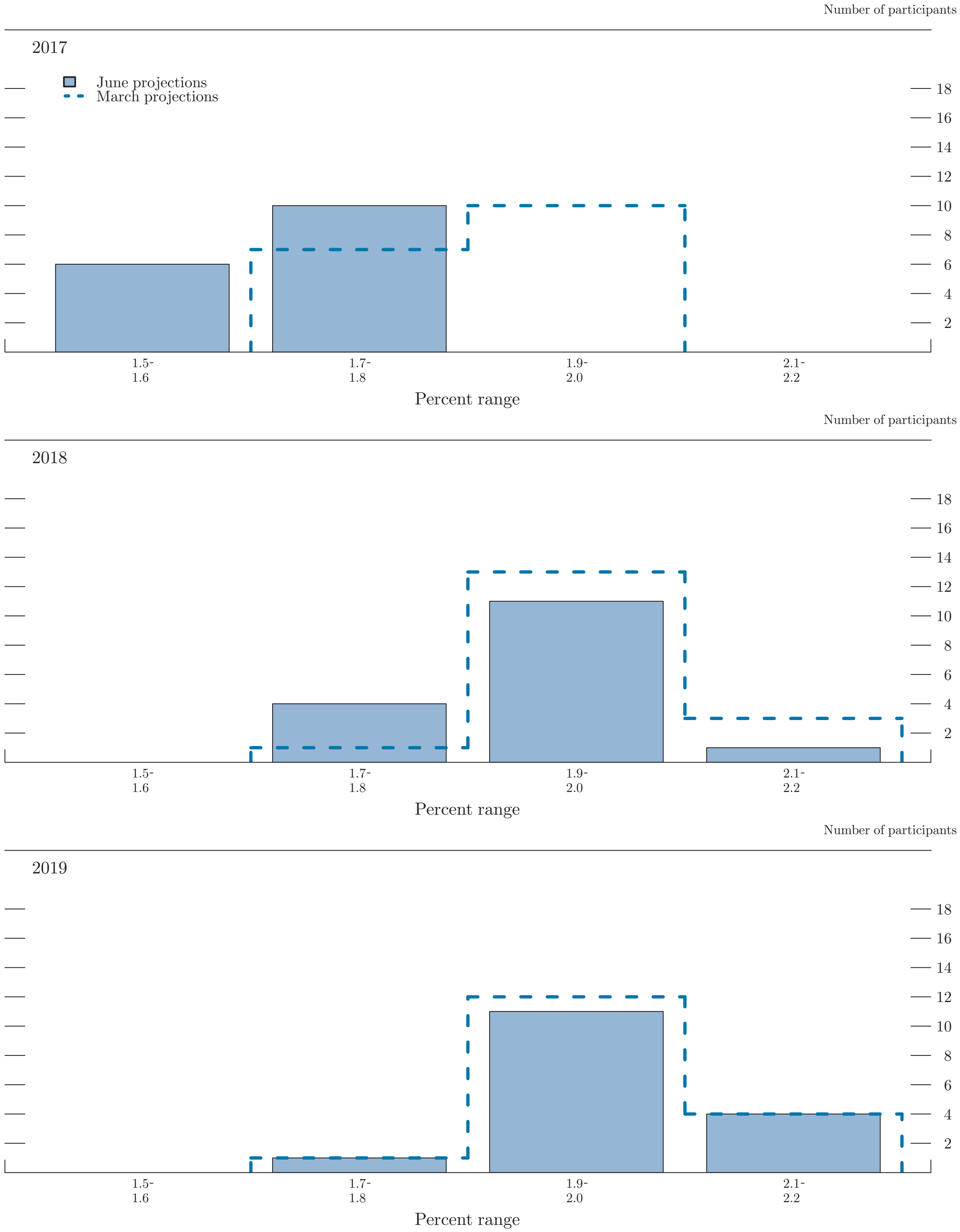
NOTE: Definitions of variables and other explanations are in the notes to table 1.

Figure 3.C. Distribution of participants' projections for PCE inflation, 2017–19 and over the longer run



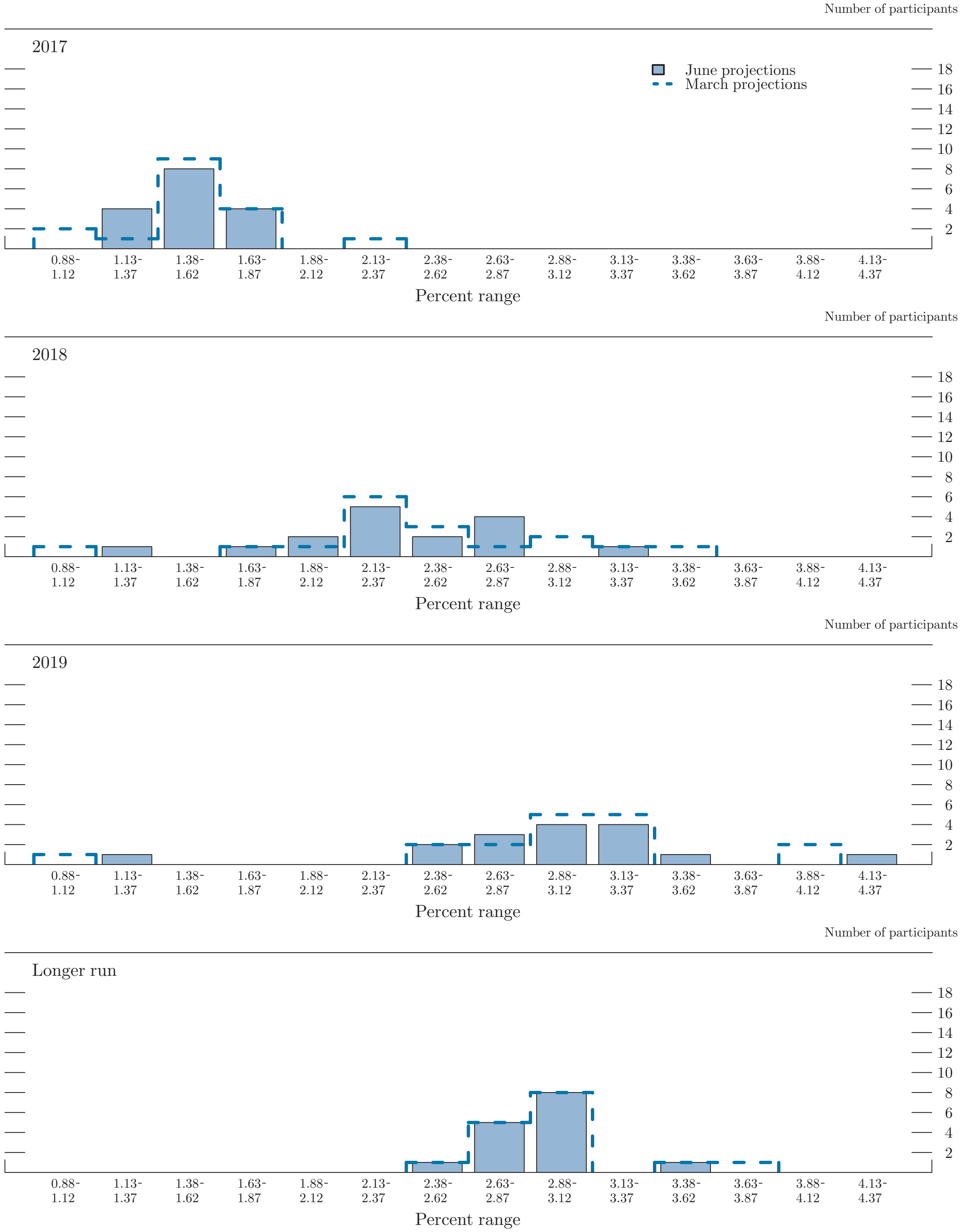
NOTE: Definitions of variables and other explanations are in the notes to table 1.

Figure 3.D. Distribution of participants' projections for core PCE inflation, 2017–19



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, 2017–19 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	2017	2018	2019
Change in real GDP[1]	±1.4	±2.0	±2.2
Unemployment rate[1]	±0.4	±1.2	±1.8
Total consumer prices[2]	±0.8	±1.0	±1.0
Short-term interest rates[3]	±0.7	±2.0	±2.2

NOTE: Error ranges shown are measured as plus or minus the root mean squared error of projections for 1997 through 2016 that were released in the summer 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), available at www.federalreserve.gov/econresdata/feds/2017/files/2017020pap.pdf.

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

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

3. For Federal Reserve staff forecasts, measure is the federal funds rate. For other forecasts, measure is the rate on 3-month Treasury bills. Historical projections are the average level, in percent, in the fourth quarter of the year indicated.

of each year from 2017 to 2019 and over the longer run.[5] The distribution for 2017 was less dispersed than that in March, while the distribution for 2018 was slightly less dispersed. The distributions in 2019 and in the longer run were broadly similar to those in March. The median projections of the federal funds rate continued to show gradual increases, with the median assessment for 2017 standing at 1.38 percent, consistent with three 25 basis point increases this year. Thereafter, the medians of the projections were 2.13 percent at the end of 2018 and 2.94 percent at the end of 2019; the median of the longer-run projections of the federal funds rate was 3.00 percent.

In discussing their June projections, many participants continued to express the view that the appropriate upward trajectory of the federal funds rate over the next few years would likely be gradual. That anticipated pace reflected a few factors, such as a neutral real interest rate that was currently low and was expected to move up only slowly as well as a gradual return of inflation to the Committee's 2 percent objective. Several participants judged that a slightly more accommodative path of monetary policy than in their previous projections would likely be appropriate, citing an apparently slower rate of progress toward the Committee's 2 percent inflation objective. In their discussions of appropriate monetary policy, half of the participants commented on the Committee's reinvestment policy; all of those who did so expected a change in reinvestment policy before the end of this year.

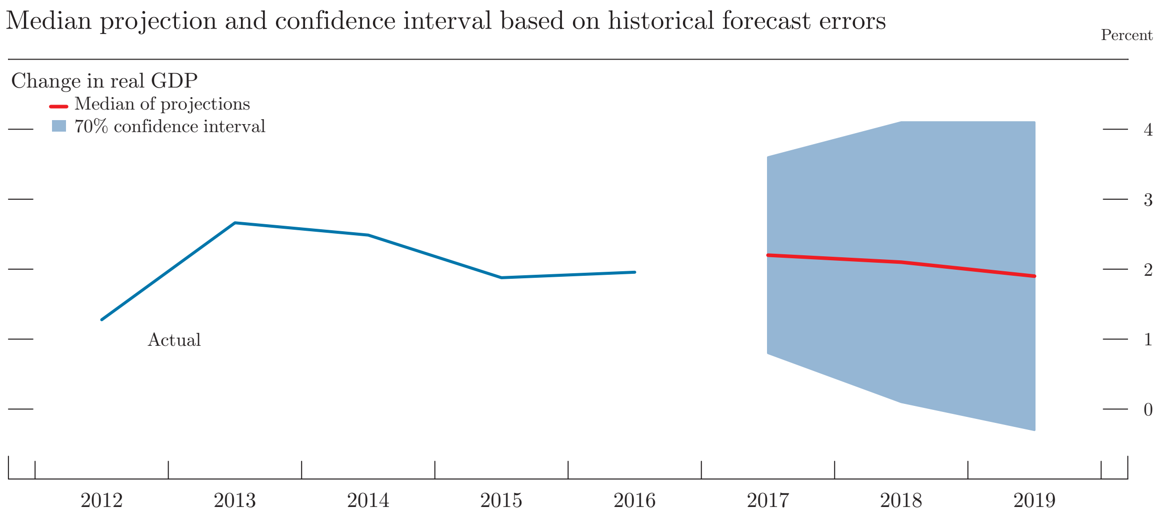
Uncertainty and Risks

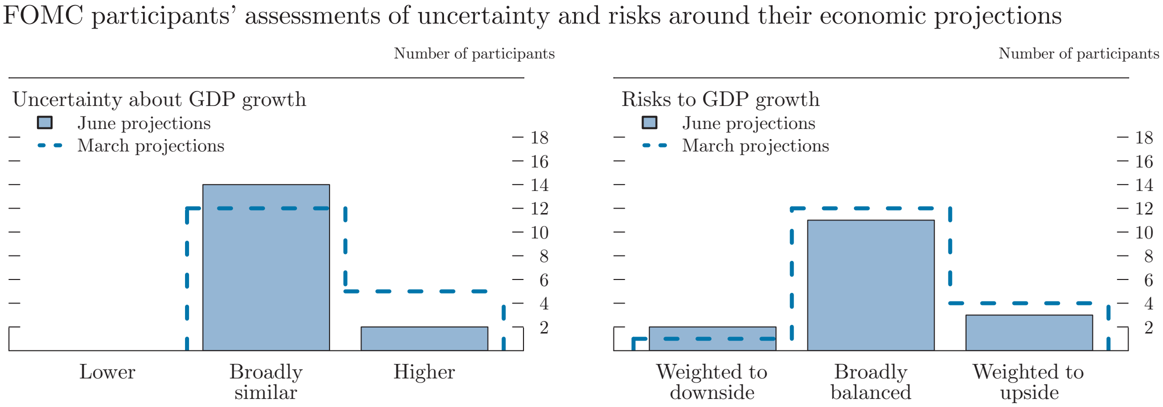
Projections of economic variables are subject to considerable uncertainty. In assessing the path of monetary policy that, in their view, is likely to be most appropriate, FOMC participants take account of the range of possible outcomes, the likelihood of those outcomes, and the potential benefits and costs to the economy should they occur. Table 2 provides one measure of forecast uncertainty for the change in real GDP, the unemployment rate, and total consumer price inflation—the root mean squared error (RMSE) for forecasts made over the past 20 years. This measure of forecast uncertainty is incorporated graphically in the top panels of figures 4.A, 4.B, and 4.C, which display fan charts plotting the median SEP projections for the three variables surrounded by symmetric confidence intervals derived from the RMSEs presented in table 2. If the degree of uncertainty attending these projections is similar to the typical magnitude of past forecast errors and if the risks around the projections are broadly balanced, future outcomes of these variables would have about a 70 percent probability of occurring within these confidence intervals. For all three variables, this measure of forecast uncertainty is substantial and generally increases as the forecast horizon lengthens.

FOMC participants may judge that the width of the historical fan charts shown in figures 4.A through 4.C does not adequately capture their current assessments of the degree of uncertainty that surrounds their economic projections. Participants' assessments of the current level of uncertainty surrounding their economic projections are shown in the bottom-left panels of figures 4.A, 4.B, and 4.C. All or nearly all participants viewed the

[5] One participant's projections for the federal funds rate, real GDP growth, the unemployment rate, and inflation were informed by the view that there are multiple possible medium-term regimes for the U.S. economy, that these regimes are persistent, and that the economy shifts between regimes in a way that cannot be forecast. Under this view, the economy currently is in a regime characterized by expansion of economic activity with low productivity growth and a low short-term real interest rate, but longer-term outcomes for variables other than inflation cannot be usefully projected.

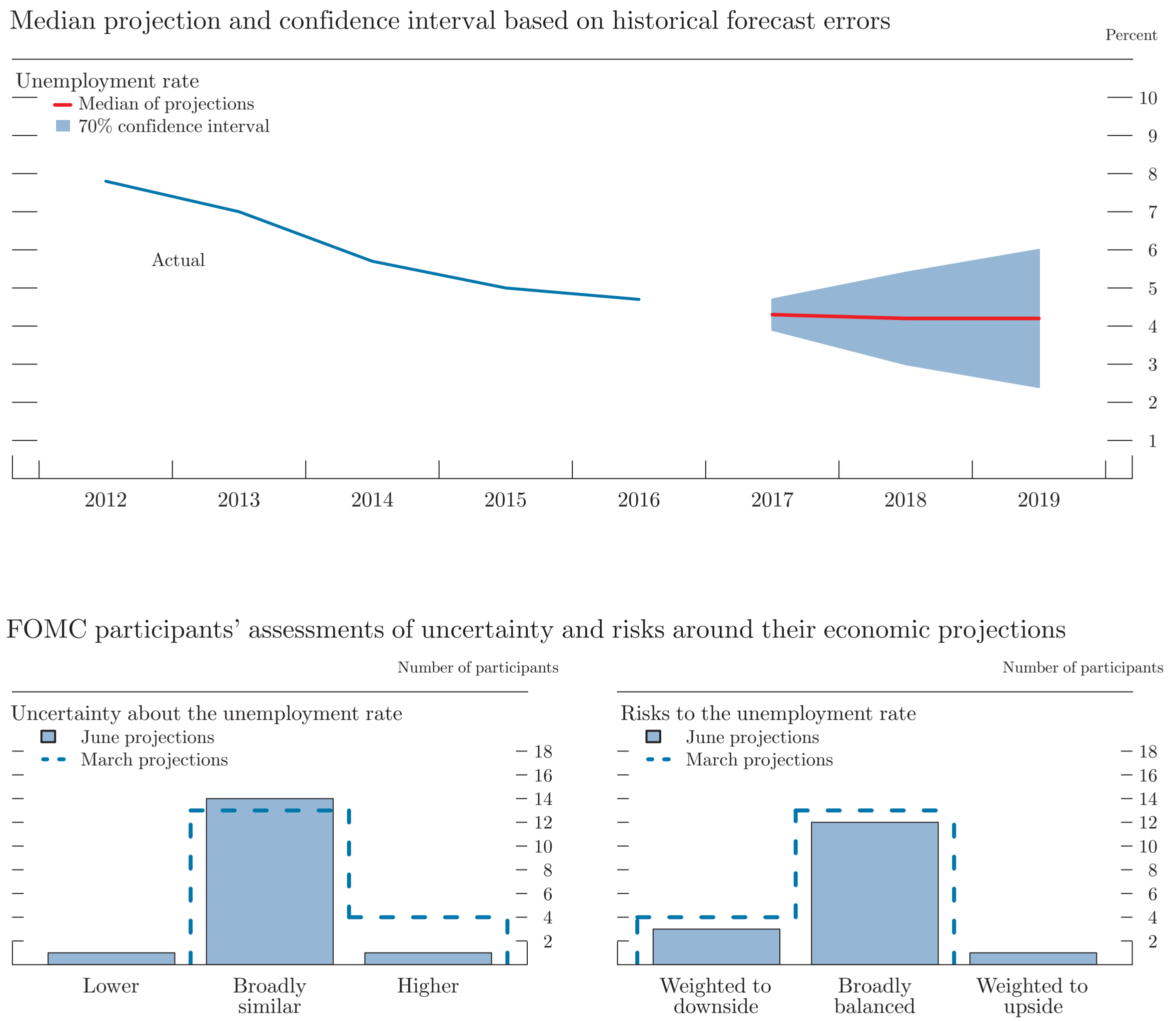
Figure 4.A. Uncertainty and risks in projections of GDP growth





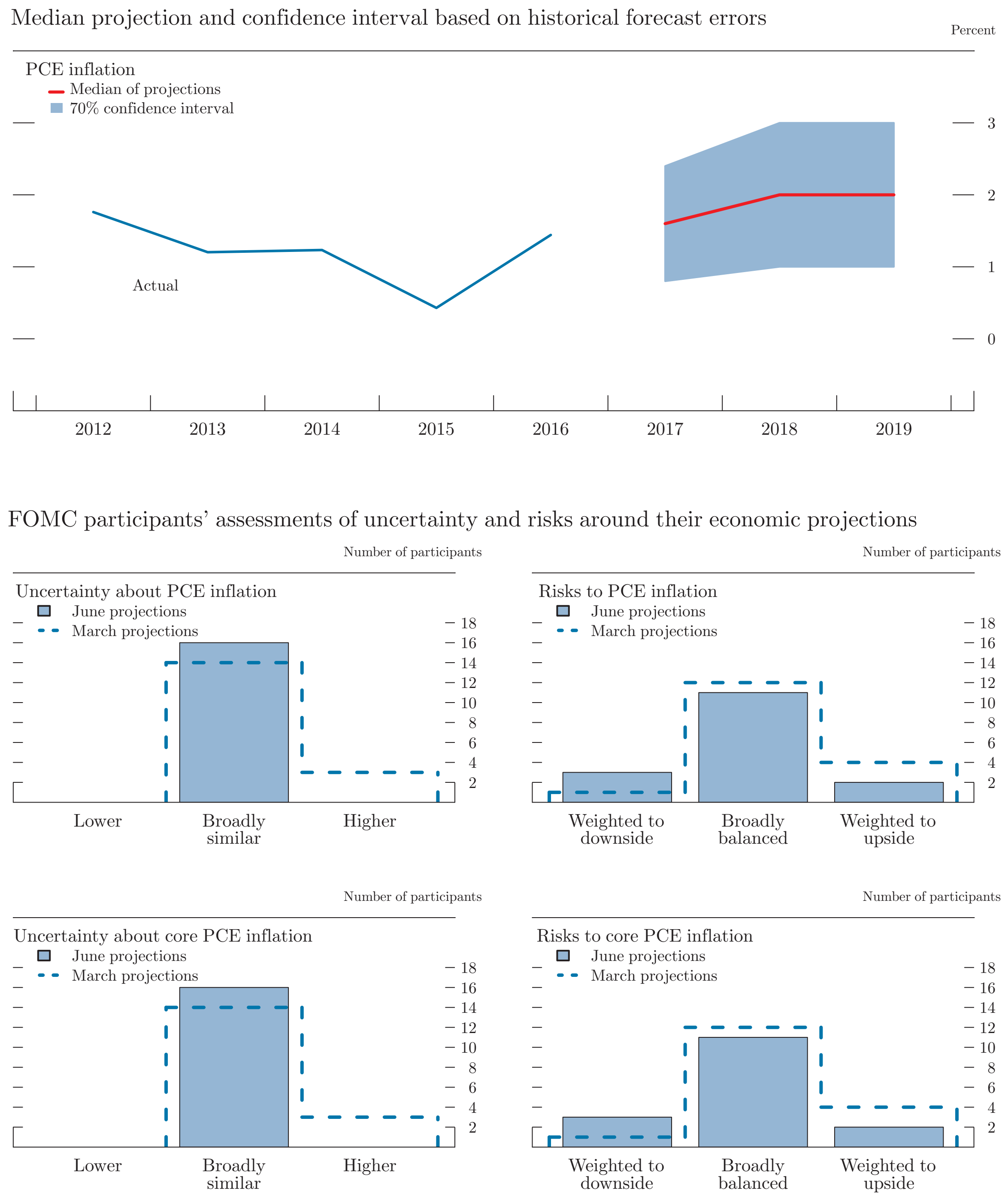
Note: The blue and red lines in the top panel show actual values and median projected values, respectively, of the percent change in real gross domestic product (GDP) from the fourth quarter of the previous year to the fourth quarter of the year indicated. The confidence interval around the median projected 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



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."

uncertainty attached to their economic projections as broadly similar to the average of the past 20 years, with three fewer participants than in March seeing uncertainty about GDP growth, the unemployment rate, and inflation as higher than its historical average.[6] In their discussion of the uncertainty attached to their current projections, most participants again expressed the view that, at this point, uncertainty surrounding prospective changes in fiscal and other government policies is very large or that there is not yet enough information to make reasonable assumptions about the timing, nature, and magnitude of the changes.

The fan charts—which are constructed so as to be symmetric around the median projections—also may not fully reflect participants' current assessments of the balance of risks to 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. As in March, most participants judged the risks to their projections of 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. Three participants judged the risks to the unemployment rate as weighted to the downside, and one participant judged the risks as weighted to the upside (as shown in the lower-right panel of figure 4.B). In addition, the balance of risks to participants' inflation projections shifted down slightly from March (shown in the lower-right panels of figure 4.C), as two fewer participants judged the risks to inflation to be weighted to the upside and two more viewed the risks as weighted to the downside.

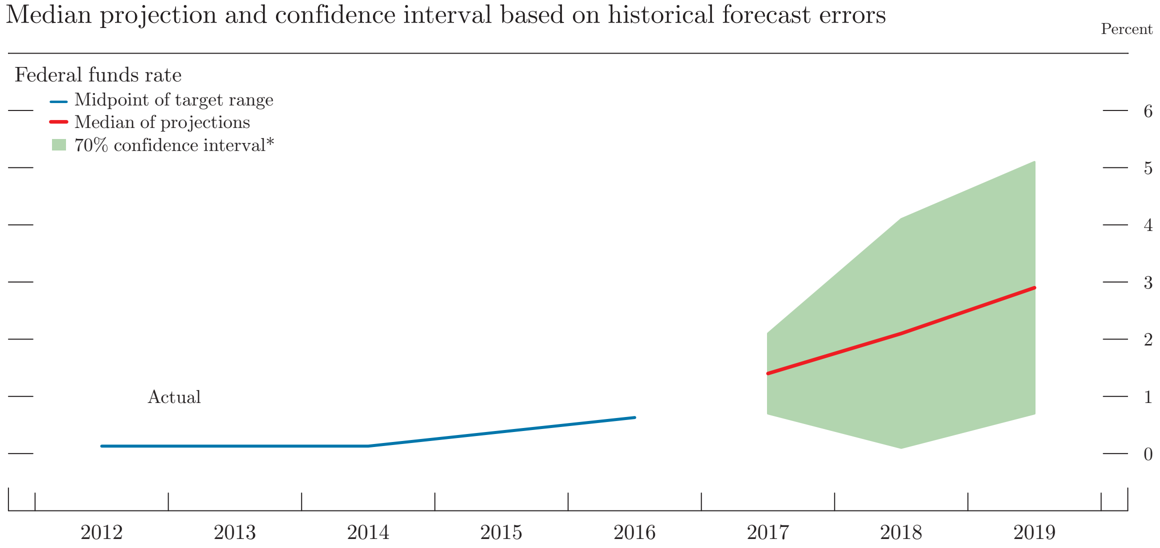
Participants' assessments of the future path of the federal funds rate consistent with appropriate policy are also subject to considerable uncertainty, reflecting in part uncertainty about the evolution of GDP growth, the unemployment rate, and inflation over time. The final line in table 2 shows the RMSEs for forecasts of short-term interest rates. These RMSEs are not strictly consistent with the SEP projections for the federal funds rate, in part because the SEP projections are not forecasts of the likeliest outcomes but rather reflect each participant's individual assessment of appropriate monetary policy. However, the associated confidence intervals provide a sense of the likely uncertainty around the future path of the federal funds rate generated by the uncertainty about the macroeconomic variables and additional adjustments to monetary policy that may be appropriate to offset the effects of shocks to the economy.

Figure 5 shows a fan chart plotting the median SEP projections for the appropriate path of the federal funds rate surrounded by confidence intervals derived from the results presented in table 2. As with the macroeconomic variables, forecast uncertainty is substantial and increases at longer horizons.[7]

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

[7] 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 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 and would not have any implication for possible future policy decisions regarding the use of negative interest rates to provide additional monetary policy accommodation if doing so were appropriate.

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 1.6 to 4.4 percent in the current year, 1.0 to 5.0 percent in the second year, and 0.8 to 5.2 percent in the third year. The corresponding 70 percent confidence intervals for overall inflation would be 1.2 to 2.8 percent in the current year, and 1.0 to 3.0 percent in the second and third 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.