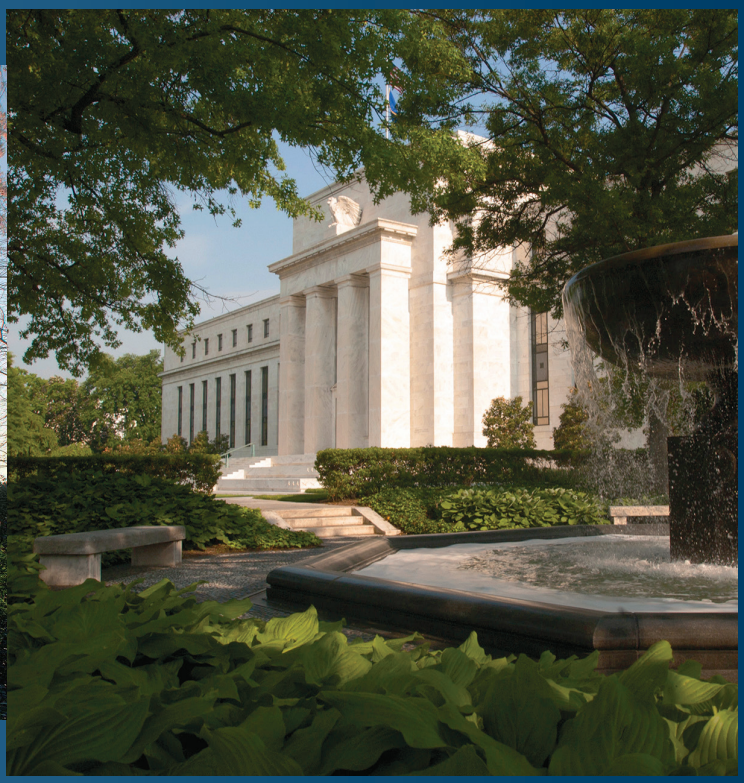
For use at 11:00 a.m. EDT
July 5, 2019

Monetary Policy Report

July 5, 2019



Board of Governors of the Federal Reserve System

Letter of Transmittal

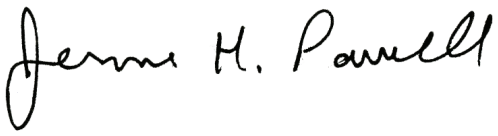
Board of Governors of the
Federal Reserve System

Washington, D.C., July 5, 2019

The President of the Senate
The Speaker of the House of Representatives

The Board of Governors is pleased to submit its *Monetary Policy Report* pursuant to section 2B of the Federal Reserve Act.

Sincerely,



Jerome H. Powell, Chairman

Statement on Longer-Run Goals and Monetary Policy Strategy

Adopted effective January 24, 2012; as amended effective January 29, 2019

The Federal Open Market Committee (FOMC) is firmly committed to fulfilling its statutory mandate from the Congress of promoting maximum employment, stable prices, and moderate long-term interest rates. The Committee seeks to explain its monetary policy decisions to the public as clearly as possible. Such clarity facilitates well-informed decisionmaking by households and businesses, reduces economic and financial uncertainty, increases the effectiveness of monetary policy, and enhances transparency and accountability, which are essential in a democratic society.

Inflation, employment, and long-term interest rates fluctuate over time in response to economic and financial disturbances. Moreover, monetary policy actions tend to influence economic activity and prices with a lag. Therefore, the Committee's policy decisions reflect its longer-run goals, its medium-term outlook, and its assessments of the balance of risks, including risks to the financial system that could impede the attainment of the Committee's goals.

The inflation rate over the longer run is primarily determined by monetary policy, and hence the Committee has the ability to specify a longer-run goal for inflation. The Committee reaffirms its judgment that inflation at the rate of 2 percent, as measured by the annual change in the price index for personal consumption expenditures, is most consistent over the longer run with the Federal Reserve's statutory mandate. The Committee would be concerned if inflation were running persistently above or below this objective. Communicating this symmetric inflation goal clearly to the public helps keep longer-term inflation expectations firmly anchored, thereby fostering price stability and moderate long-term interest rates and enhancing the Committee's ability to promote maximum employment in the face of significant economic disturbances. The maximum level of employment is largely determined by nonmonetary factors that affect the structure and dynamics of the labor market. These factors may change over time and may not be directly measurable. Consequently, it would not be appropriate to specify a fixed goal for employment; rather, the Committee's policy decisions must be informed by assessments of the maximum level of employment, recognizing that such assessments are necessarily uncertain and subject to revision. The Committee considers a wide range of indicators in making these assessments. Information about Committee participants' estimates of the longer-run normal rates of output growth and unemployment is published four times per year in the FOMC's Summary of Economic Projections. For example, in the most recent projections, the median of FOMC participants' estimates of the longer-run normal rate of unemployment was 4.4 percent.

In setting monetary policy, the Committee seeks to mitigate deviations of inflation from its longer-run goal and deviations of employment from the Committee's assessments of its maximum level. These objectives are generally complementary. However, under circumstances in which the Committee judges that the objectives are not complementary, it follows a balanced approach in promoting them, taking into account the magnitude of the deviations and the potentially different time horizons over which employment and inflation are projected to return to levels judged consistent with its mandate.

The Committee intends to reaffirm these principles and to make adjustments as appropriate at its annual organizational meeting each January.

Contents

List of Boxes

Note: This report reflects information that was publicly available as of noon EDT on July 2, 2019. Unless otherwise stated, the time series in the figures extend through, for daily data, July 1, 2019; for monthly data, May 2019; and, for quarterly data, 2019:Q1. In bar charts, except as noted, the change for a given period is measured to its final quarter from the final quarter of the preceding period.

Summary

Economic activity increased at a solid pace in the early part of 2019, and the labor market has continued to strengthen. However, inflation has been running below the Federal Open Market Committee's (FOMC) longer-run objective of 2 percent. At its meeting in June, the FOMC judged that current and prospective economic conditions called for maintaining the target range for the federal funds rate at 2¼ to 2½ percent. Nonetheless, in light of increased uncertainties around the economic outlook and muted inflation pressures, the Committee indicated that it will closely monitor the implications of incoming information for the economic outlook and will act as appropriate to sustain the expansion, with a strong labor market and inflation near the Committee's symmetric 2 percent objective.

Economic and Financial Developments

The labor market. The labor market has continued to strengthen. Over the first five months of 2019, payrolls increased an average of 165,000 per month. This rate is down from the average pace of 223,000 in 2018, but it is faster than what is needed to provide jobs for new entrants into the labor force. The unemployment rate moved down from 3.9 percent in December to 3.6 percent in May; meanwhile, wage gains have remained moderate.

Inflation. Consumer price inflation, as measured by the 12-month change in the price index for personal consumption expenditures, moved down from a little above the FOMC's objective of 2 percent in the middle of last year to a rate of 1.5 percent in May. The 12-month measure of inflation that excludes food and energy items (so-called core inflation), which historically has been a better indicator than the overall figure of where inflation will be in the future, was 1.6 percent in May—down from a rate of 2 percent from a year ago. However, these year-over-year declines mainly reflect soft readings in the monthly price data earlier this year, which appear to reflect transitory influences. Survey-based measures of longer-run inflation expectations are little changed, while market-based measures of inflation compensation have declined recently to levels close to or below the low levels seen late last year.

Economic growth. In the first quarter, real gross domestic product (GDP) is reported to have increased at an annual rate of 3.1 percent, bolstered by a sizable contribution from net exports and business inventories. By contrast, consumer spending in the first quarter was lackluster but appears to have picked up in recent months. Meanwhile, following robust gains last year, business fixed investment slowed in the first quarter, and indicators suggest that investment decelerated further in the spring. All told, incoming data for the second quarter suggest a moderation in GDP growth—despite a pickup in consumption—as the contributions from net exports and inventories reverse and the impetus from business investment wanes further.

Financial conditions. Nominal Treasury yields moved significantly lower over the first half of 2019, largely reflecting investors' concerns about trade tensions and the global economic outlook, as well as expectations of a more accommodative path for the federal funds rate than had been anticipated earlier. On net, since the end of 2018, spreads of yields on corporate bonds over those on comparable-maturity Treasury securities have narrowed, and stock prices have increased. Moreover, loans remained widely available for most households, and credit provided by commercial banks continued to expand at a moderate pace. Overall, domestic financial conditions for businesses and households continued to be supportive of economic growth over the first half of 2019.

Financial stability. The U.S. financial system continues to be substantially more resilient than in the period leading up to the financial crisis. Asset valuations remain somewhat elevated in a number of markets, with investors continuing to exhibit high appetite for risk. Borrowing by businesses continues to outpace GDP, with the most rapid increases in debt concentrated among the riskiest firms. In contrast, household borrowing remains modest relative to income, and the debt growth is concentrated among borrowers with high credit scores. Key financial institutions, including the largest banks, continue to be well capitalized and hold large quantities of liquid assets. Funding risks in the financial system remain low relative to the period leading up to the crisis.

International developments. After slowing in 2018, foreign economic growth appears to have stabilized in the first half of the year, but at a restrained pace. While aggregate activity in the advanced foreign economies (AFEs) increased slowly from the soft patch of late last year, activity in emerging Asia generally struggled to gain a solid footing, and several Latin American economies continued to underperform. Growth abroad has been held down in part by a slowdown in the manufacturing sector against the backdrop of softening global trade flows. With both inflation and activity in the AFEs remaining subdued, AFE central banks took a more accommodative policy stance.

Despite trade tensions that weighed on financial markets, financial conditions abroad generally eased in the first half of the year, supported by accommodative communications by major central banks. On balance, global equity prices moved higher, sovereign yields in major foreign economies declined, and sovereign bond spreads in the emerging market economies were little changed. Market-implied paths of policy rates in AFEs generally declined.

Monetary Policy

Interest rate policy. In its meetings over the first half of 2019, the FOMC judged that the stance of monetary policy was appropriate to achieve the Committee's objectives of maximum employment and 2 percent inflation, and it decided to maintain the target range for the federal funds rate at 2¼ to 2½ percent. These decisions reflected incoming information showing the solid fundamentals of the U.S. economy supporting continued growth and strong employment. For most of this period, the Committee indicated that, in light of global economic and financial developments and muted inflation pressures, it would be patient as it determines what future adjustments to the target range for the federal funds rate may be appropriate. At the June FOMC meeting, however, the Committee noted that uncertainties about the global and domestic economic outlook had increased. In light of these uncertainties and muted inflation pressures, the Committee indicated that it will act as appropriate to sustain the expansion, with a strong labor market and inflation near its symmetric 2 percent objective.

In the most recent Summary of Economic Projections, which was compiled at the time of the June FOMC meeting, participants generally revised down their individual assessments of the appropriate path for monetary policy relative to their assessments at the time of the March meeting. (The participants' most recent economic projections—released after the June FOMC meeting—are discussed in more detail in Part 3 of this report.) However, as the Committee has continued to emphasize, the timing and size of future adjustments to the target range for the federal funds rate will depend on the Committee's assessment of realized and expected economic conditions relative to its objectives of maximum employment and 2 percent inflation.

Balance sheet policy. Over the first half of the year, the FOMC made two announcements regarding the longer-run policy implementation framework and its plans for normalizing the balance sheet. Following its January meeting, the Committee noted that it decided to continue to implement monetary policy in a regime with ample reserves. Consistent with that decision, in March, the Committee announced plans to conclude the reduction of its aggregate securities holdings at the end of September 2019. (See the box "Framework for Monetary Policy Implementation and Normalization of the Federal Reserve's Balance Sheet" in Part 2.) The Committee is prepared to adjust the details for completing balance sheet normalization in light of economic and financial developments, consistent with its policy objectives of maximum employment and price stability.

Special Topics

Labor market conditions for lower- and higher-educated workers. The labor market has strengthened since the end of the last recession, but the pattern of recovery has varied across workers with different levels of education. Workers with a college degree or more experienced a swifter recovery in employment, while those with a high school degree or less had a much more delayed recovery in employment. This pattern is typical of business cycles, and recent research sheds light on mechanisms that may lead to differences in the timing of recovery for lower- and higher-educated workers. (See the box "How Have Lower-Educated Workers Fared since the Great Recession?" in Part 1.)

Global manufacturing and trade. Growth in global trade and manufacturing has weakened significantly since 2017 even as growth in services has held up. Trade policy developments appear to have lowered trade flows to some extent, while uncertainty surrounding trade policy may be weighing on investment. The global tech cycle and a general slowdown in global demand, reflecting idiosyncratic factors specific to different economies, have also likely weighed on demand for traded goods. (See the box "The Persistent Slowdown in Global Trade and Manufacturing" in Part 1.)

Monetary policy rules. Monetary policy rules are mathematical formulas that relate a policy interest rate, such as the federal funds rate, to a small number of other economic variables, typically including the deviation of inflation from its target value and a measure of resource slack in the economy. The prescriptions for the policy interest rate from these rules can provide helpful guidance for the FOMC. This discussion presents five policy rules—illustrative of the many rules that have received attention in the research literature—and provides examples of two ways to compute historical prescriptions of policy rules. (See the box "Monetary Policy Rules and Their Interactions with the Economy" in Part 2.)

Monetary policy implementation and balance sheet normalization. Since the beginning of this year, the FOMC has made important decisions regarding its framework for monetary policy implementation and the process of normalizing the size of its balance sheet. The Committee decided to continue to implement monetary policy in a regime with an ample supply of reserves and announced that it intends to conclude the reduction of its aggregate securities holdings in the System Open Market Account at the end of September 2019. (See the box "Framework for Monetary Policy Implementation and Normalization of the Federal Reserve's Balance Sheet" in Part 2.)

Part 1
Recent Economic and Financial Developments

Domestic Developments

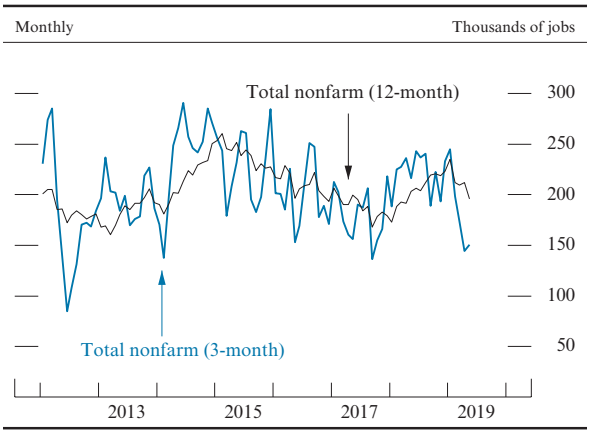
The labor market strengthened further during the first half of 2019 but at a slower pace than last year . . .

Labor market conditions have continued to strengthen so far this year but at a pace slower than last year. Total nonfarm payroll employment has averaged gains of about 165,000 per month over the first five months of 2019, according to the Bureau of Labor Statistics. This pace is slower than the average monthly gains in 2018, but it is faster than what is needed to provide jobs for net new entrants into the labor force as the working-age population grows (figure 1).[1]

In April and May of this year, the unemployment rate stood at 3.6 percent, ¼ percentage point lower than its level in December 2018 and its lowest level since 1969 (figure 2). In addition, the unemployment rate is ½ percentage point below the median of Federal Open Market Committee (FOMC) participants' estimates of its longer-run normal level.[2]

In May, the labor force participation rate (LFPR) for individuals 16 and over—that is, the share of the population either working or actively seeking work—was 62.8 percent, and it has changed little, on net, since late 2013. The aging of the population is an important contributor to an underlying downward trend

1. Net change in payroll employment

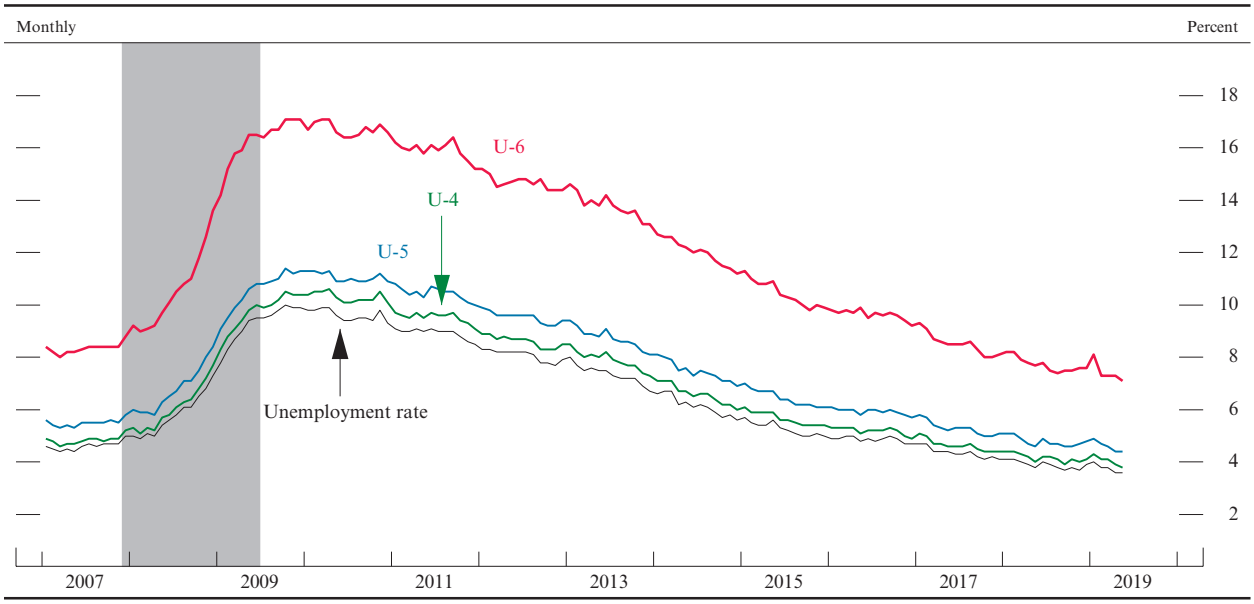


Note: The data are 3-month and 12-month moving averages.
Source: Bureau of Labor Statistics via Haver Analytics.

1. Owing to population growth, roughly 115,000 to 145,000 jobs per month need to be created, on average, to keep the unemployment rate constant with an unchanged labor force participation rate. However, the participation rate fell over the December to May period, reducing the number of job gains that would have been needed. There is considerable uncertainty around these estimates, as the difference between monthly payroll gains and employment changes from the Current Population Survey (the source of the unemployment and participation rates) can be quite volatile over short periods.

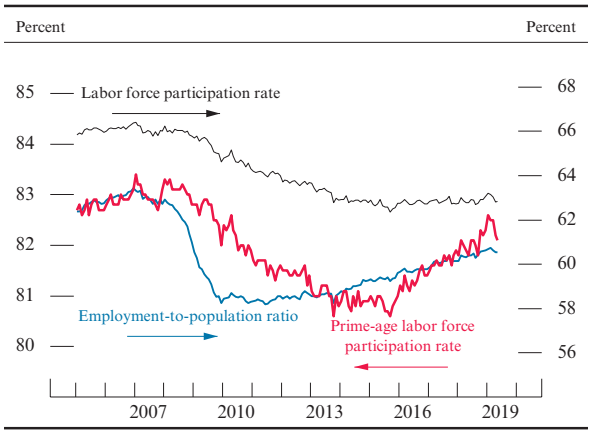
2. See the most recent economic projections that were released after the June FOMC meeting in Part 3 of this report.

2. Measures of labor underutilization



NOTE: Unemployment rate measures total unemployed as a percentage of the labor force. U-4 measures total unemployed plus discouraged workers, as a percentage of the labor force plus discouraged workers. Discouraged workers are a subset of marginally attached workers who are not currently looking for work because they believe no jobs are available for them. U-5 measures total unemployed plus all marginally attached to the labor force, as a percentage of the labor force plus persons marginally attached to the labor force. Marginally attached workers are not in the labor force, want and are available for work, and have looked for a job in the past 12 months. U-6 measures total unemployed plus all marginally attached workers plus total employed part time for economic reasons, as a percentage of the labor force plus all marginally attached workers. The shaded bar indicates a period of business recession as defined by the National Bureau of Economic Research.
SOURCE: Bureau of Labor Statistics via Haver Analytics.

3. Labor force participation rates and employment-to-population ratio



NOTE: The data are monthly. The prime-age labor force participation rate is a percentage of the population aged 25 to 54. The labor force participation rate and the employment-to-population ratio are percentages of the population aged 16 and over.
SOURCE: Bureau of Labor Statistics via Haver Analytics.

in the overall participation rate. In particular, members of the baby-boom cohort are increasingly moving into their retirement years, ages when labor force participation typically falls. The flat trajectory in the overall LFPR is therefore consistent with strengthening labor market conditions; indeed, the LFPR for prime-age individuals (between 25 and 54 years old), which is much less sensitive to the effects of population aging, has been rising over the past few years (figure 3). Combining both the unemployment rate and the LFPR, the employment-to-population ratio (EPOP) for individuals 16 and over—the share of that segment of the population who are working—was 60.6 percent in May and has been gradually increasing throughout the expansion. The increase has been considerably larger for those with at least some college education than for those with no more than a high school diploma. (The box "How Have Lower-Educated Workers Fared since the

Great Recession?" discusses movements in the EPOP by educational level over the current expansion.)

Other indicators are also consistent with strong labor market conditions. As reported in the Job Openings and Labor Turnover Survey (JOLTS), the average of the private-sector job openings rate over the first four months of the year was near its historical high, consistent with surveys indicating that businesses see vacancies as hard to fill. Similarly, the quits rate in the JOLTS is also near the top of its historical range, an indication that workers are being bid away from their current jobs or have become more confident that they can successfully switch jobs if they wish to. This interpretation accords well with surveys of consumers that indicate households perceive jobs as plentiful. The JOLTS layoff rate and the number of people filing initial claims for unemployment insurance benefits have both remained quite low.

. . . and unemployment rates have fallen for all major demographic groups over the past several years

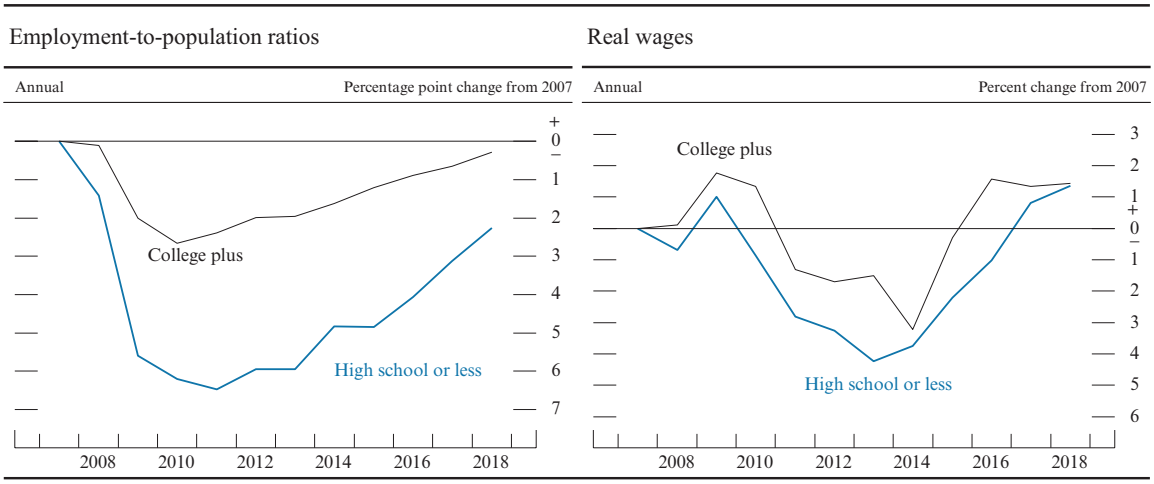
Differences in unemployment rates across ethnic and racial groups have narrowed in recent years, as they typically do during economic expansions, after having widened during the recession (figure 4). However, unemployment rates for African Americans and Hispanics remain substantially above those for whites and Asians. The rise in LFPRs for prime-age individuals over the past few years has also been apparent in each of these racial and ethnic groups (figure 5).

Increases in labor compensation have picked up but remain moderate by historical standards . . .

Despite strong labor market conditions, the available indicators generally suggest that increases in hourly labor compensation have remained moderate. The employment cost index—a measure of both wages and the cost to employers of providing benefits—was

How Have Lower-Educated Workers Fared since the Great Recession?

A. Prime-age employment and wages by education, 2007–18



SOURCE: Staff calculations using the Current Population Survey.

The U.S. labor market has been strengthening since the end of the Great Recession. Over this period, the unemployment rate has fallen roughly 6 percentage points, and the employment-to-population ratio (EPOP) for individuals between 25 and 54 years old (prime age) has increased about 4¼ percentage points. However, labor market outcomes during the expansion have been quite different for lower- and higher-educated individuals. The EPOP for prime-age college graduates declined about 2.5 percentage points during the recession, but it began a steady and sustained recovery in 2010 and was nearly at its pre-recession level by 2018 (left panel of figure A). In contrast, the EPOP for prime-age individuals with a high school degree or less fell much more sharply during the recession and lingered near its trough for several years before it began to recover in 2014.[1] As of 2018, the EPOP for lower-educated workers remained well below its pre-recession level. In addition, real (or inflation-adjusted) hourly wages for lower-educated workers fell more over the 2007–13 period than real wages for college graduates (right panel of figure A). Real wages subsequently picked up for both groups, but cumulative real wage gains for lower-educated workers have only recently caught up, in percentage terms, to those for workers with college degrees.[2]

The relative underperformance of employment and wage growth for lower-educated workers has been a characteristic of all business cycles since at least 1980. This pattern is likely due, at least in part, to a long-term downward trend in the demand for lower-educated workers that is unrelated to the business cycle and caused, perhaps, by changes in technology and globalization.[3] To focus on the effects of business cycles distinct from these longer-term trends, we examine business cycles at the state level to estimate the

(continued)

1. The analysis excludes those with some college education but not a four-year degree. The labor market experience of such individuals, though, is similar to that of individuals with a high school degree or less.

2. Another measure of wage growth using the same Current Population Survey data source is the Federal Reserve Bank of Atlanta's Wage Growth Tracker (WGT), which calculates the median, year-over-year percent change in nominal wages of individuals employed 12 months apart. The WGT measure shows that median wage growth for workers with a high school degree was lower than median wage growth for workers with a college degree through 2015. Since then, median wage growth for both groups has been similar.

3. The EPOP for lower-educated, prime-age individuals has been trending lower for men since 1950 and for women since 2000, largely reflecting the trends in those groups' labor force participation rates (LFPRs). For an overview of factors affecting the LFPRs of prime-age individuals, see the box "The Labor Force Participation Rate for Prime-Age Individuals" in Board of Governors of the Federal Reserve System (2018), *Monetary Policy Report* (Washington: Board of Governors, July), pp. 8–10, https://www.federalreserve.gov/monetarypolicy/files/20180713_mprfullreport.pdf; and Congressional Budget Office (2018), *Factors Affecting the Labor Force Participation of People Ages 25 to 54* (Washington: CBO, February, https://www.cbo.gov/system/files/115th-congress-2017-2018/reports/53452-lfpr.pdf).

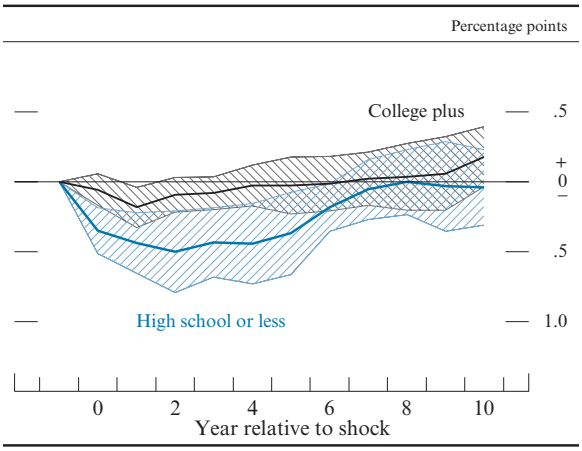
"typical" cyclical decline and recovery of employment for both education groups.

The typical state-level business cycle shows a starkly different evolution of employment for lower-educated workers compared with that for workers with college degrees. Typically in a recession, the EPOP declines immediately for both groups, but the decline is deeper and longer lasting for those with a high school degree or less (figure B).[4] Once that group's EPOP begins a sustained recovery, though, it increases at a more rapid pace than the EPOP for those with a college degree. These results indicate that the EPOP for lower-educated workers may not fully recover for at least eight years, on average, following the end of a recession.

The differences in labor market outcomes over the business cycle for different education groups may in part be due to employers changing their hiring standards. Some research shows that employers raise skill requirements for new hires in a recession and then gradually lower skill requirements as the labor market recovers.[5] Other research suggests that when high-skilled workers lose their jobs during recessions, they take jobs that require fewer skills, making these jobs less likely to be filled by low-skilled individuals.[6] This pattern could at least in part explain the differences in labor market outcomes for lower- and higher-educated workers since the most recent recession.

As the unemployment rate falls and employers relax their hiring standards, more opportunities are likely to open for lower-educated workers. Aaronson and others (2019) present some evidence that disadvantaged groups, such as nonwhite individuals and those with less education, benefit more from further improvement in the labor market relative to more advantaged groups when the unemployment rate is below its natural rate.[7] Indeed, real wages for lower-educated workers rose faster over the past few years as the labor market tightened, and total wage growth for those workers since 2007 is now close to wage growth for more-educated workers (as shown in the right panel of figure A). Hotchkiss and Moore (2018) find that exposure to a low-unemployment economy is particularly beneficial for individuals who entered the labor market during periods of high unemployment and would otherwise face persistently worse labor market outcomes.[8] Thus, periods of low unemployment may particularly improve labor market outcomes of lower-educated workers.

B. Response of EPOP by education to state-level recessions



NOTE: EPOP refers to the employment-to-population ratio. Shaded areas are 95 percent confidence bands. Data extend from 1978 through 2018.

SOURCE: Tomaz Cajner, John Coglianese, and Joshua Montes (2019), "Cyclical Dynamics of the U.S. Labor Market," unpublished paper, Board of Governors of the Federal Reserve System, Division of Research and Statistics, March.

4. For ease of interpretation, we define a typical recession as a state experiencing a temporary 1 percent decline in state output growth in a given year, returning to normal growth in the following year. To get the estimated effect of a larger or smaller recession, simply multiply the estimates by the specified decline in output growth.

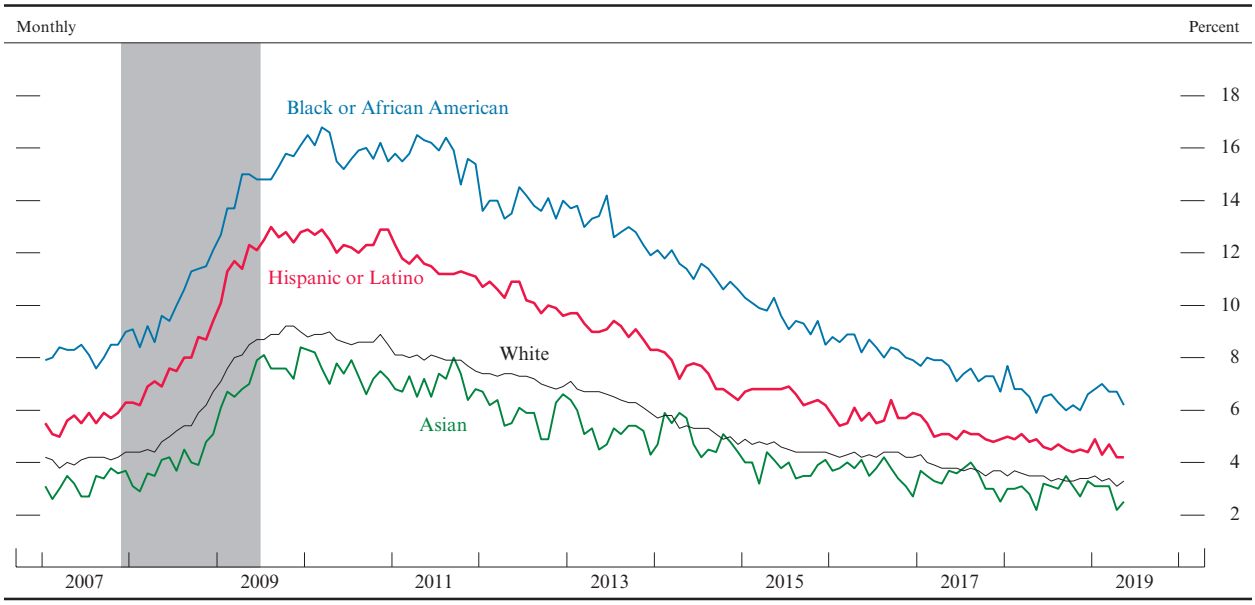
5. See Brad Hershbein and Lisa B. Kahn (2018), "Do Recessions Accelerate Routine-Biased Technological Change? Evidence from Vacancy Postings," *American Economic Review*, vol. 108 (July), pp. 1737–72; and Alicia Sasser Modestino, Daniel Shoag, and Joshua Ballance (2016), "Downskilling: Changes in Employer Skill Requirements over the Business Cycle," *Labour Economics*, vol. 41 (August), pp. 333–47.

6. See Regis Barnichon and Yanos Zylberberg (2019), "Underemployment and the Trickle-Down of Unemployment," *American Economic Journal: Macroeconomics*, vol. 11 (April), pp. 40–78.

7. See Stephanie R. Aaronson, Mary C. Daly, William Wascher, and David W. Wilcox (2019), "Okun Revisited: Who Benefits Most from a Strong Economy?" paper presented at the Brookings Papers on Economic Activity Conference, held at the Brookings Institution, Washington, March 7–8, https://www.brookings.edu/wp-content/uploads/2019/03/Okun-Revisited-Who-Benefits-Most-From-a-Strong-Economy.pdf.

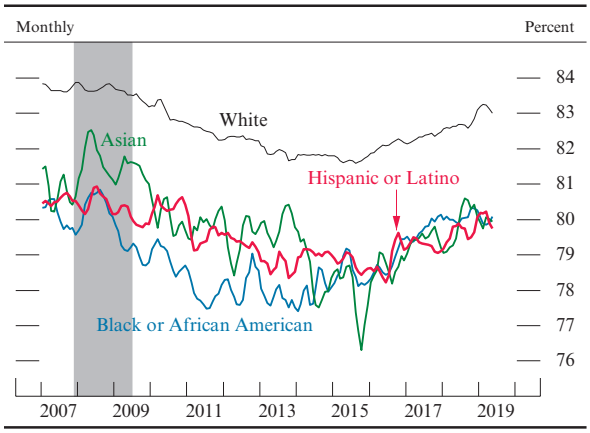
8. See Julie L. Hotchkiss and Robert E. Moore (2018), "Some Like It Hot: Assessing Longer-Term Labor Market Benefits from a High-Pressure Economy," Andrew Young School of Policy Studies Research Paper Series 18-01 (Atlanta: Georgia State University, February), https://aysps.gsu.edu/files/2018/03/18-01-HotchkissMoore-SomelikeitHot.pdf.

4. Unemployment rate by race and ethnicity



NOTE: Unemployment rate measures total unemployed as a percentage of the labor force. Persons whose ethnicity is identified as Hispanic or Latino may be of any race. The shaded bar indicates a period of business recession as defined by the National Bureau of Economic Research.
SOURCE: Bureau of Labor Statistics via Haver Analytics.

5. Prime-age labor force participation rate by race and ethnicity



NOTE: The prime-age labor force participation rate is a percentage of the population aged 25 to 54. Persons whose ethnicity is identified as Hispanic or Latino may be of any race. The data are seasonally adjusted by Board staff and are 3-month moving averages. The shaded bar indicates a period of business recession as defined by the National Bureau of Economic Research.
SOURCE: Bureau of Labor Statistics via Haver Analytics.

2¾ percent higher in March of 2019 relative to its year-earlier level (figure 6). Compensation per hour in the business sector—a broad-based but volatile measure of wages, salaries, and benefits—rose 1½ percent over the four quarters ending in 2019:Q1, less than the annual increases over the preceding couple of years. Among measures that do not account for benefits, average hourly earnings rose 3.1 percent in May relative to 12 months earlier, a slightly faster rate of increase than during the same period of a year ago. According to the Federal Reserve Bank of Atlanta, the median 12-month wage growth of individuals reporting to the Current Population Survey increased about 3¾ percent in May, near the upper portion of its range over the past couple of years.[3]

3. The Atlanta Fed's measure differs from others in that it measures the wage growth only of workers who were employed both in the current survey month and 12 months earlier.

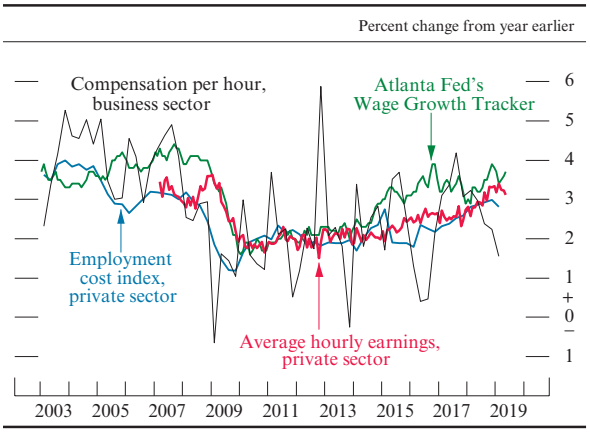
. . . and likely have been restrained by slow growth in labor productivity over much of the expansion

These moderate rates of hourly compensation gains likely reflect the offsetting influences of a strengthening labor market and productivity growth that has been weak through much of the expansion. From 2008 to 2017, labor productivity increased a little more than 1 percent per year, on average, well below the average pace from 1996 to 2007 of nearly 3 percent and also below the average gain in the 1974–95 period (figure 7). Although considerable debate remains about the reasons for the slowdown in productivity growth over this period, the weakness may be partly attributable to the sharp pullback in capital investment during the most recent recession and the relatively slow recovery that followed. More recently, however, labor productivity rose 1¾ percent in 2018 and picked up further in the first quarter of 2019.[4] While it is uncertain whether this faster rate of growth will persist, a sustained pickup in productivity growth, as well as additional labor market strengthening, would support stronger gains in labor compensation.

Price inflation has dipped below 2 percent this year

Consumer price inflation has moved down below the FOMC's objective of 2 percent this year.[5] As measured by the 12-month change in the price index for personal consumption expenditures (PCE), inflation is estimated to have been 1.5 percent in May after being at or

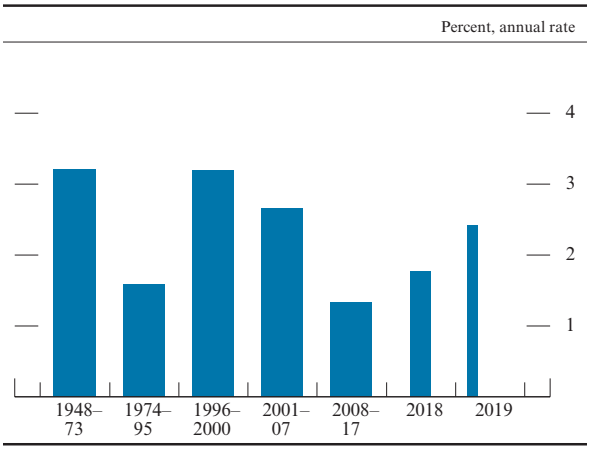
6. Measures of change in hourly compensation



NOTE: Business-sector compensation is on a 4-quarter percent change basis. For the private-sector employment cost index, change is over the 12 months ending in the last month of each quarter; for private-sector average hourly earnings, the data are 12-month percent changes and begin in March 2007; for the Atlanta Fed's Wage Growth Tracker, the data are shown as a 3-month moving average of the 12-month percent change.

SOURCE: Bureau of Labor Statistics; Federal Reserve Bank of Atlanta, Wage Growth Tracker; all via Haver Analytics.

7. Change in business-sector output per hour



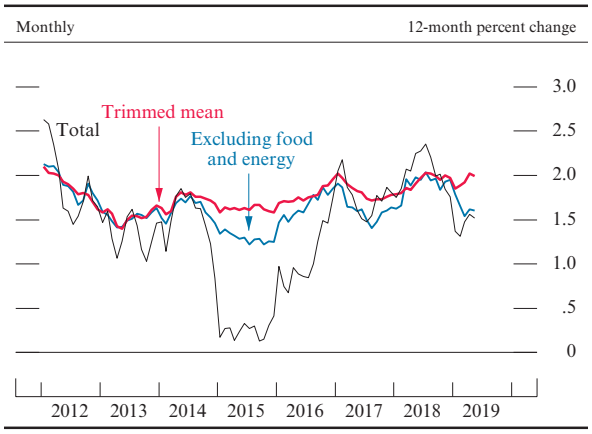
NOTE: Changes are measured from Q4 of the year immediately preceding the period through Q4 of the final year of the period except 2019 changes, which are calculated from 2018:Q1 to 2019:Q1.

SOURCE: Bureau of Labor Statistics via Haver Analytics.

4. In the first quarter, labor productivity surged 3½ percent at an annual rate, bringing the four-quarter change to 2½ percent, reflecting a strong pickup in business-sector output and unusual weakness in hours relative to measured gains in payroll employment. This weakness is attributable to a steep decline in a volatile component of hours that is not directly measured in the Bureau of Labor Statistics' establishment survey.

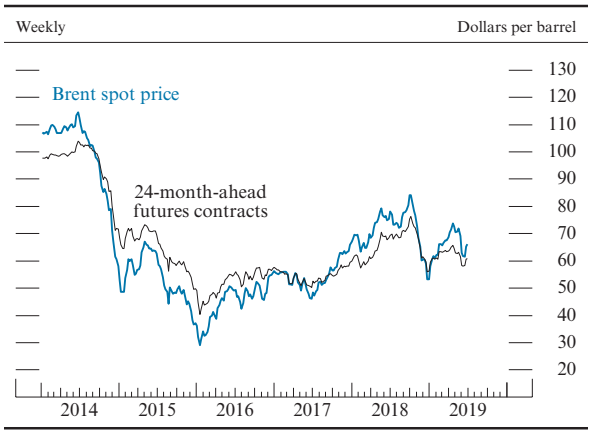
5. The increases in tariffs on imported goods last year likely provided only a small boost to inflation in 2018 and in the first half of this year.

8. Change in the price index for personal consumption expenditures



SOURCE: For trimmed mean, Federal Reserve Bank of Dallas; for all else, Bureau of Economic Analysis; all via Haver Analytics.

9. Spot and futures prices for crude oil



NOTE: The data are weekly averages of daily data. The weekly data begin on Thursdays and extend through July 1, 2019.
SOURCE: ICE Brent Futures via Bloomberg.

above 2 percent for much of 2018 (figure 8). Core PCE inflation—which excludes consumer food and energy prices that are often quite volatile, and which therefore typically provides a better indication than the total measure of where overall inflation will be in the future—also moved lower in recent months and is estimated to have been 1.6 percent over the 12 months ending in May. The slowing in core inflation to date reflects particularly low readings in the first three months of the year that appear due to idiosyncratic price declines in a number of specific categories such as apparel, used cars, and banking services and portfolio management services. Indeed, in April and May, core inflation accelerated, posting larger average monthly gains than in the first quarter.

The trimmed mean PCE price index, produced by the Federal Reserve Bank of Dallas, provides an alternative way to purge inflation of transitory influences, and it is less sensitive than the core index to idiosyncratic price movements such as those noted earlier.[6] The 12-month change in this measure was 2 percent in May.

Oil prices rebounded through the spring but have moved down recently . . .

After dropping sharply late last year, the Brent price of crude oil moved up to almost $75 per barrel in mid-April, partly reflecting declines in production in Iran and Venezuela and voluntary supply cuts by other OPEC members and partner countries (figure 9). More recently, however, prices have fallen back to around $65 per barrel because of concerns about global growth. The changes in oil prices have contributed to similar movements in retail gasoline prices, which rose through early spring but have also fallen back recently.

6. The trimmed mean index excludes whichever prices showed the largest increases or decreases in a given month. Note that, since 1995, changes in the trimmed mean index have averaged about 0.3 percentage point above core PCE inflation and 0.2 percentage point above total PCE inflation.

. . . and prices of imports other than energy fell

Nonfuel import prices, before accounting for the effects of tariffs on the price of imported goods, have continued to decline from their mid-2018 peak, responding to dollar appreciation, lower foreign inflation, and declines in non-oil commodity prices (figure 10).[7] In particular, prices of industrial metals have fallen in recent months, partly on concerns about weak global demand.

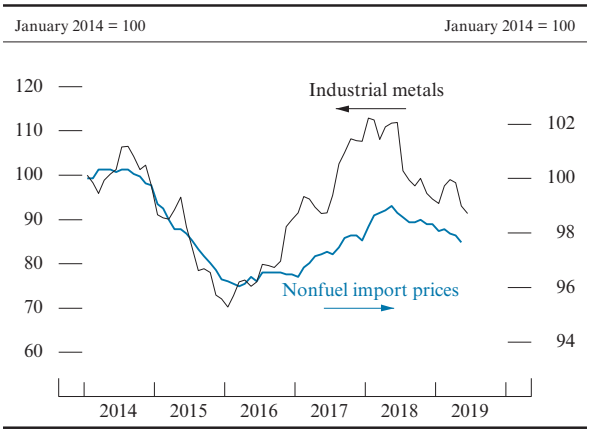
Survey-based measures of inflation expectations have been stable . . .

Expectations of inflation likely influence actual inflation by affecting wage- and price-setting decisions. Survey-based measures of inflation expectations at medium- and longer-term horizons have remained generally stable over the past year. In the Survey of Professional Forecasters, conducted by the Federal Reserve Bank of Philadelphia, the median expectation for the annual rate of increase in the PCE price index over the next 10 years has been very close to 2 percent for the past several years (figure 11). In the University of Michigan Surveys of Consumers, the median value for inflation expectations over the next 5 to 10 years has fluctuated around 2½ percent since the end of 2016, though this level is about ¼ percentage point lower than had prevailed through 2014. In the Survey of Consumer Expectations, conducted by the Federal Reserve Bank of New York, the median of respondents' expected inflation rate three years hence has fluctuated between 2½ percent and 3 percent over the past five years.

. . . while market-based measures of inflation compensation have come down since the first half of 2018

Inflation expectations can also be gauged by market-based measures of inflation

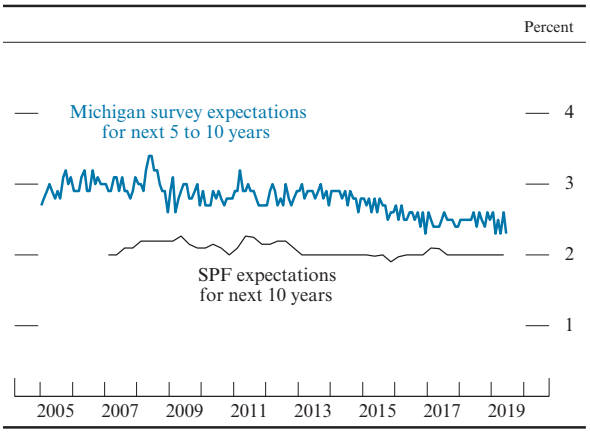
10. Nonfuel import prices and industrial metals indexes



NOTE: The data for nonfuel import prices are monthly. The data for industrial metals are a monthly average of daily data and extend through June 28, 2019.

SOURCE: For nonfuel import prices, Bureau of Labor Statistics; for industrial metals, S&P GSCI Industrial Metals Spot Index via Haver Analytics.

11. Median inflation expectations

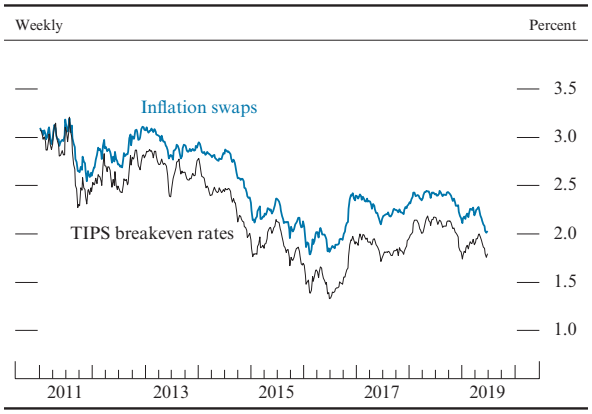


NOTE: The Michigan survey data are monthly and extend through June 2019. The SPF data for inflation expectations for personal consumption expenditures are quarterly and extend from 2007:Q1 through 2019:Q2.

SOURCE: University of Michigan Surveys of Consumers; Federal Reserve Bank of Philadelphia, Survey of Professional Forecasters (SPF).

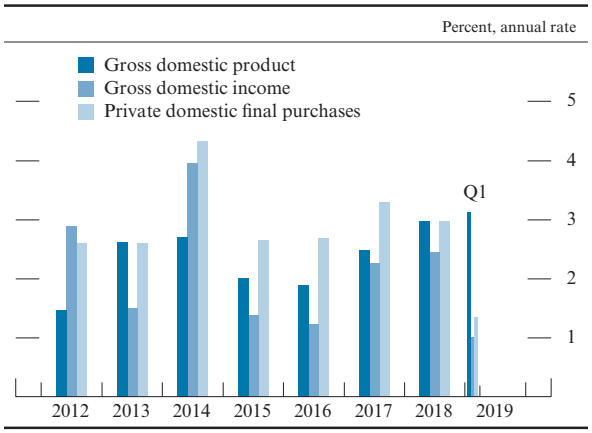
7. Published import price indexes exclude tariffs. However, tariffs add to the prices that purchasers of imports actually pay.

12. 5-to-10-year-forward inflation compensation



NOTE: The data are weekly averages of daily data and extend through June 28, 2019. TIPS is Treasury Inflation-Protected Securities.
SOURCE: Federal Reserve Bank of New York; Barclays; Federal Reserve Board staff estimates.

13. Change in real gross domestic product and gross domestic income



SOURCE: Bureau of Economic Analysis via Haver Analytics.

compensation. However, the inference is not straightforward, because market-based measures can be importantly affected by changes in premiums that provide compensation for bearing inflation and liquidity risks. Measures of longer-term inflation compensation—derived either from differences between yields on nominal Treasury securities and those on comparable-maturity Treasury Inflation-Protected Securities (TIPS) or from inflation swaps—tend to fall when markets are volatile because of the incorporation of liquidity risks. Such declines occurred around the turn of the year and again in May and June, when market volatility picked up again. Despite the fluctuations this year, these measures of inflation compensation remain notably below levels that prevailed in the summer of 2018 (figure 12).[8] The TIPS-based measure of 5-to-10-year-forward inflation compensation and the analogous measure from inflation swaps are now about 1¾ percent and 2 percent, respectively, with both measures below their respective ranges that prevailed for most of the 10 years before the start of the notable declines in mid-2014.[9]

Real gross domestic product growth was strong in the first quarter, but there are recent signs of slowing

Real gross domestic product (GDP) rose at an annual rate of 3 percent in 2018 (figure 13). In the first quarter, real GDP again moved up at an annual rate of around 3 percent.

8. Inflation compensation implied by the TIPS breakeven inflation rate is based on the difference, at comparable maturities, between yields on nominal Treasury securities and yields on TIPS, which are indexed to the total consumer price index (CPI). Inflation swaps are contracts in which one party makes payments of certain fixed nominal amounts in exchange for cash flows that are indexed to cumulative CPI inflation over some horizon. Inflation compensation derived from inflation swaps typically exceeds TIPS-based compensation, but week-to-week movements in the two measures are highly correlated.

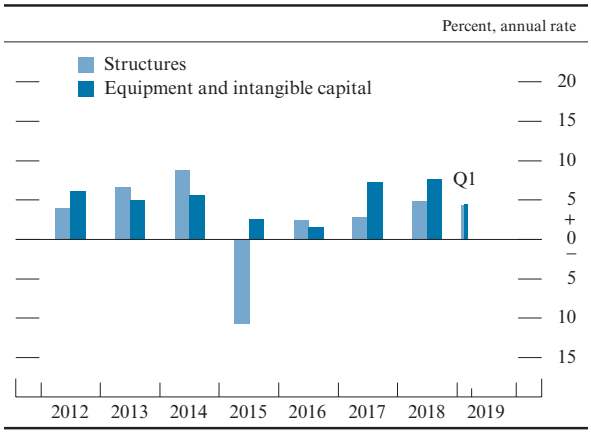
9. As these measures are based on the CPI inflation index, one should probably subtract about ¼ percentage point—the average differential with PCE inflation and CPI inflation over the past two decades—to infer inflation compensation on a PCE price basis.

However, there are indications that growth will moderate in the second quarter.[10] Net exports and business inventories provided a sizable boost to first-quarter GDP growth, but their contributions appear to have reversed in the months following. Notably, private domestic final purchases—that is, final purchases by households and businesses, which tend to provide a better indication of future GDP growth than most other components of overall spending—posted only a modest increase in the first quarter. The slowing that occurred in consumer spending appears to have been temporary, but the slowing in business fixed investment appears to be more persistent. Manufacturing output fell in the first quarter, and it moved down further in April before posting a small gain in May. Although lower production levels of motor vehicles and aircraft were important contributors to the weakness, the recent declines in manufacturing were broad based.[11] Nevertheless, the economic expansion continues to be abetted by steady job gains, increases in household wealth, expansionary fiscal policy, and still-supportive domestic financial conditions, including moderate borrowing costs and easy access to credit for many households and businesses.

Growth in business fixed investment has softened after strong gains in 2018

Investment spending by businesses rose rapidly in 2018 but appears to have decelerated sharply this year. In the first quarter, growth slowed to an annual rate of 4½ percent, while new orders for nondefense capital goods, excluding the volatile aircraft category, have declined modestly, on balance, in recent months (figure 14). In addition, forward-

14. Change in real private nonresidential fixed investment

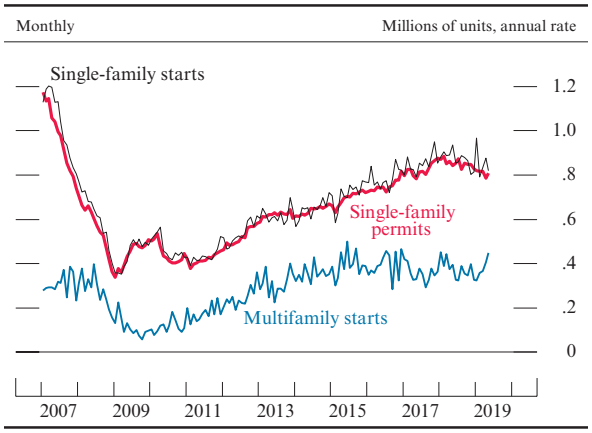


SOURCE: Bureau of Economic Analysis via Haver Analytics.

10. It is worth noting that gross domestic income (GDI) has been notably weaker than GDP. GDI is reported to have risen only 1.7 percent in the first quarter relative to the same period of a year ago, 1½ percentage points less than measured GDP growth. GDP and GDI measure the same economic concept, and any difference between the two figures reflects measurement error.

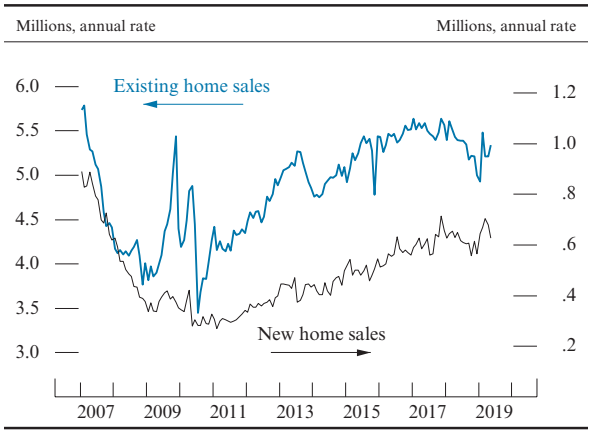
11. Recently, a large aircraft manufacturer slowed its production and temporarily halted deliveries of an aircraft model. This production slowdown lowers manufacturing output and generates a small drag on real GDP growth in the first half of the year.

15. Private housing starts and permits



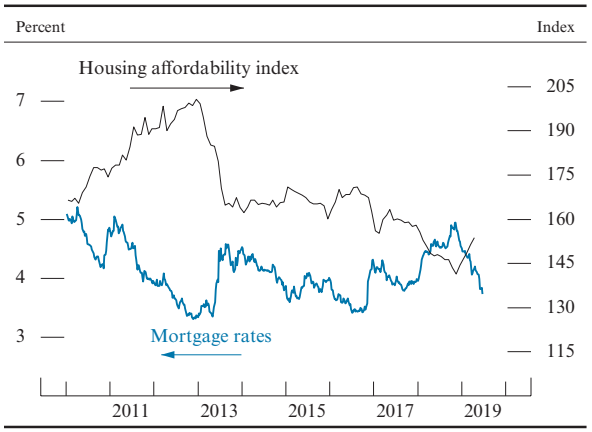
SOURCE: U.S. Census Bureau via Haver Analytics.

16. New and existing home sales



NOTE: Data are monthly. New home sales includes only single-family sales. Existing home sales includes single-family, condo, townhome, and co-op sales.
SOURCE: For new home sales, U.S. Census Bureau; for existing home sales, National Association of Realtors; all via Haver Analytics.

17. Mortgage rates and housing affordability



NOTE: The housing affordability index data are monthly through April 2019, and the mortgage rate data are weekly through June 27, 2019. At an index value of 100, a median-income family has exactly enough income to qualify for a median-priced home mortgage. Housing affordability is seasonally adjusted by Board staff.
SOURCE: For housing affordability index, National Association of Realtors via Haver Analytics; for mortgage rates, Freddie Mac Primary Mortgage Market Survey.

looking indicators of business spending such as capital spending plans have deteriorated amid downbeat business sentiment and profit expectations from industry analysts, reportedly reflecting trade tensions and concerns about global growth.

By contrast, activity in the housing sector had been declining but recently shows signs of stabilizing

Residential investment fell in 2018 and declined further in the first quarter. More recently, the pace of construction activity appears to have stabilized as housing starts for single-family and multifamily housing units rose, on average, in April and May (figure 15). Existing home sales moved higher as well over the same period, while new home sales moved down a bit following a sizable increase in the first quarter (figure 16). Consumers' perceptions of homebuying conditions and housing affordability have improved, which is consistent with the declines in mortgage rates this year and the slowing in growth of home prices (figure 17).

Ongoing improvements in the labor market and gains in wealth continue to support household income and consumer spending . . .

After increasing at a moderate pace of 2½ percent in 2018 as a whole, real consumer spending slowed considerably in the first quarter (figure 18). However, incoming data suggest that consumer spending picked up in recent months, with PCE in May up at an annual rate of 2½ percent relative to the average level in the fourth quarter.

Real disposable personal income (DPI), a measure of households' after-tax purchasing power, increased at a solid annual rate of 3 percent in 2018; however, so far this year, growth in real DPI has been more moderate despite strong gains in wage and salary income. With consumer spending rising more than disposable income so far this year, the personal saving rate moved down from an average of

6½ percent in the fourth quarter to around 6 percent in May (figure 19).

Ongoing gains in household wealth have likely continued to support consumer spending. House prices, which are of particular importance for the balance sheet positions of a large portion of households, continued to increase through May, although at a more moderate pace than in recent years (figure 20). In addition, U.S. equity prices, which fell sharply at the end of 2018, have rebounded this year. Buoyed by increases in home and equity prices, aggregate household net worth moved up to 6.8 times household income in the first quarter (figure 21).

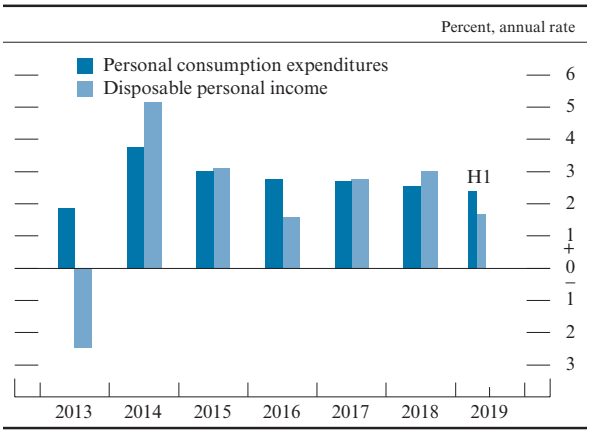
. . . and consumer sentiment remains strong

Consumers have remained upbeat. Although the Michigan index of consumer sentiment dipped at the turn of the year, it has since rallied, and the sentiment measure from the Conference Board survey also climbed in the second quarter from its first-quarter level (figure 22). In June, both the Michigan and the Conference Board indexes of consumer sentiment were about in the middle of their ranges over the past few years.

Borrowing conditions for households remain generally favorable . . .

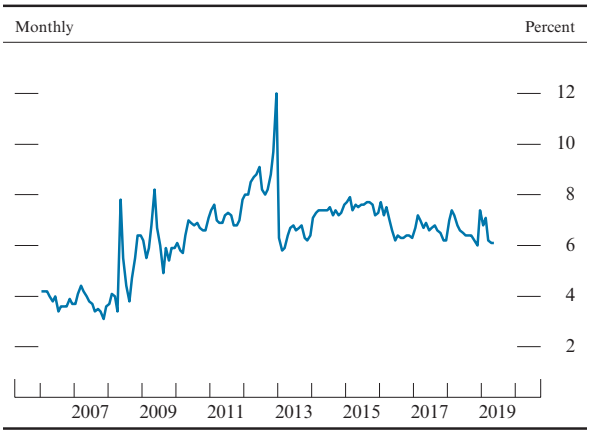
Despite increases in interest rates for consumer loans and some reported further tightening in credit card lending standards, financing conditions for consumers largely remain supportive of growth in household spending. Consumer credit expanded at a moderate pace in the first quarter, rising faster than disposable income (figure 23). Mortgage credit has continued to be readily available for households with solid credit profiles but remains noticeably tighter than before the most recent recession for borrowers with low credit scores. Standards for automotive loans have been generally stable, and overall delinquency rates for these loans were little changed in the first quarter at a

18. Change in real personal consumption expenditures and disposable personal income



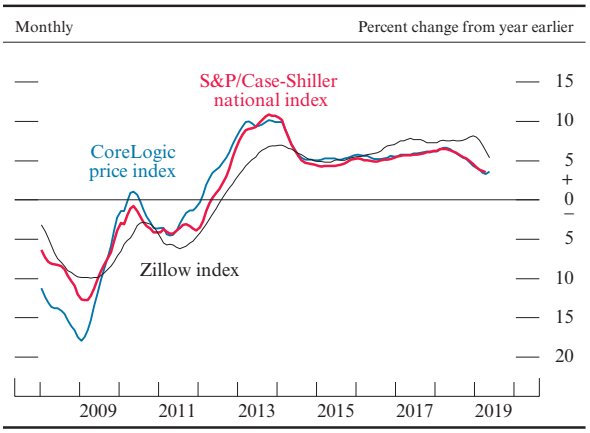
NOTE: The values for 2019:H1 are the annualized May/Q4 changes.
SOURCE: Department of Commerce, Bureau of Economic Analysis via Haver Analytics.

19. Personal saving rate



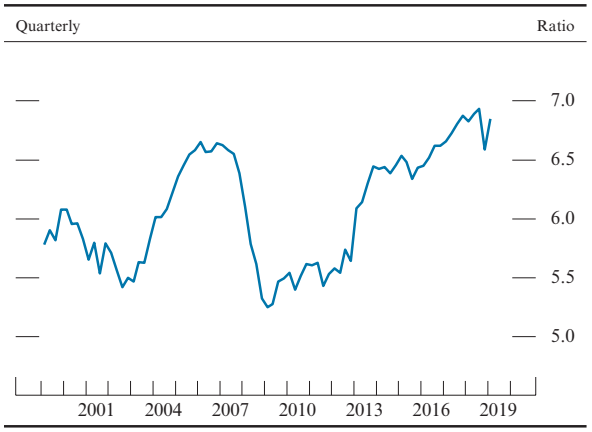
SOURCE: Bureau of Economic Analysis via Haver Analytics.

20. Prices of existing single-family houses



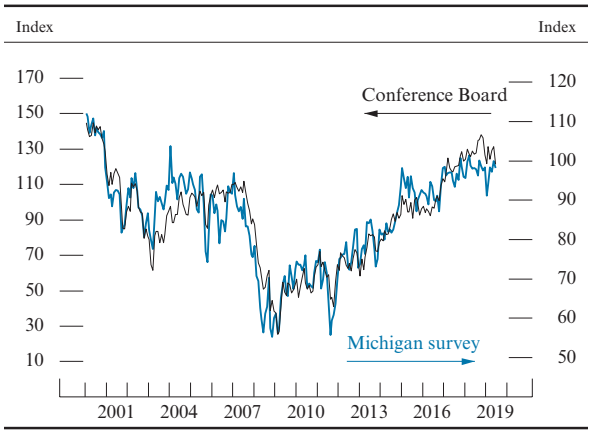
NOTE: The data for the S&P/Case-Shiller index extend through April 2019.
SOURCE: CoreLogic Home Price Index; Zillow; S&P/Case-Shiller U.S. National Home Price Index. The S&P/Case-Shiller Index is a product of S&P Dow Jones Indices LLC and/or its affiliates. (For Dow Jones Indices licensing information, see the note on the Contents page.)

21. Wealth-to-income ratio



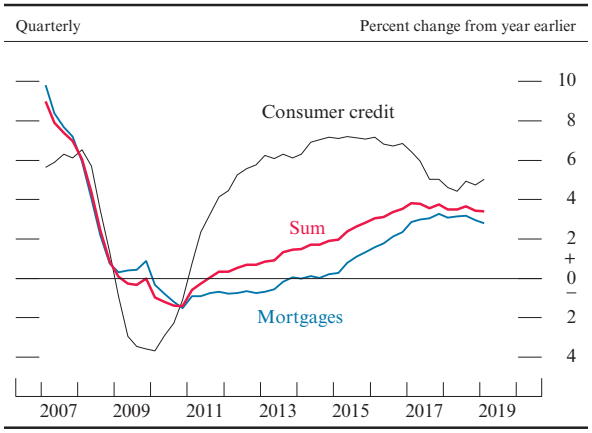
NOTE: The series is the ratio of household net worth to disposable personal income.
SOURCE: For net worth, Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States"; for income, Bureau of Economic Analysis via Haver Analytics.

22. Indexes of consumer sentiment



NOTE: The data are monthly and extend through June 2019. The Conference Board data are indexed to 100 in 1985; the Michigan survey data are indexed to 100 in 1966.
SOURCE: University of Michigan Surveys of Consumers; Conference Board.

23. Changes in household debt



SOURCE: Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States."

moderate level. Financing conditions in the student loan market remain firm, with over 90 percent of such credit being extended by the federal government. After peaking in 2013, delinquencies on such loans have been gradually declining, reflecting in part the continued improvements in the labor market.

. . . while corporate financing conditions tightened somewhat relative to last year but remained accommodative overall

Aggregate flows of credit to large nonfinancial firms remained strong in the first quarter, supported in part by relatively low interest rates and accommodative financing conditions (figure 24). The gross issuance of corporate bonds, which had fallen substantially in December, rebounded in the first quarter as market volatility receded. After increasing notably in late 2018, spreads on both investment- and speculative-grade corporate bonds over comparable-maturity Treasury securities have both declined, on net, this year as investors' risk appetite seems to have recovered. In April, respondents to the Senior Loan Officer Opinion Survey on Bank Lending Practices, or SLOOS, reported that demand for commercial and industrial loans weakened in the first quarter even as lending standards remained unchanged and terms for such loans eased.[12] However, banks reported tightening lending standards on all categories of commercial real estate loans. Meanwhile, financing conditions for small businesses have remained generally accommodative, but credit growth has been subdued.

Net exports supported GDP growth in the first quarter

After being a small drag on U.S. real GDP growth last year, net exports, which can have sizable swings from quarter to quarter, added about 1 percentage point to the rate of growth in the first quarter. Real U.S. exports increased at an annual rate of about 5½ percent, as

12. The SLOOS is available on the Board's website at https://www.federalreserve.gov/data/sloos/sloos.htm.

exports of agricultural products and automobiles expanded robustly. Real imports fell 2 percent following solid increases in 2018 (figure 25). Nominal goods trade data through May suggest that exports edged down in the second quarter, while imports were about flat. The available data suggest that the trade deficit and the current account in the first half of the year were little changed as a percent of GDP from 2018 (figure 26).

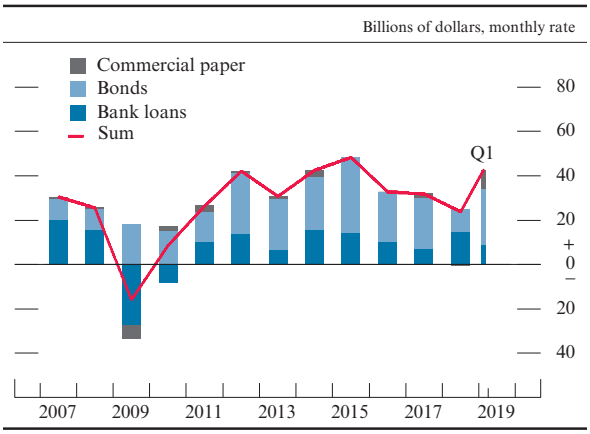
Federal fiscal policy actions boosted economic growth in 2018 but had a smaller effect on first-quarter real GDP because of the partial government shutdown . . .

Fiscal policy at the federal level boosted GDP growth in 2018 because of lower personal and business income taxes from the Tax Cuts and Jobs Act of 2017 and because of an increase in federal purchases due to the Bipartisan Budget Act of 2018.[13] After increasing 2¾ percent in 2018, federal government purchases were flat in the first quarter of 2019, reflecting the effects of the partial federal government shutdown (figure 27). The government shutdown, which was in effect from December 22 through January 25, held down GDP growth in the first quarter, largely because of the lost work of furloughed federal government workers and affected federal contractors. That said, federal purchases are expected to rebound in the second quarter.

The federal unified budget deficit widened in fiscal year 2018 to around 4 percent of nominal GDP from 3½ percent of GDP in 2017 because receipts moved lower, to 16 percent of GDP (figure 28). Expenditures are currently around 21 percent of GDP, slightly above the level that prevailed in the decade before the start of the 2007–09 recession. The ratio

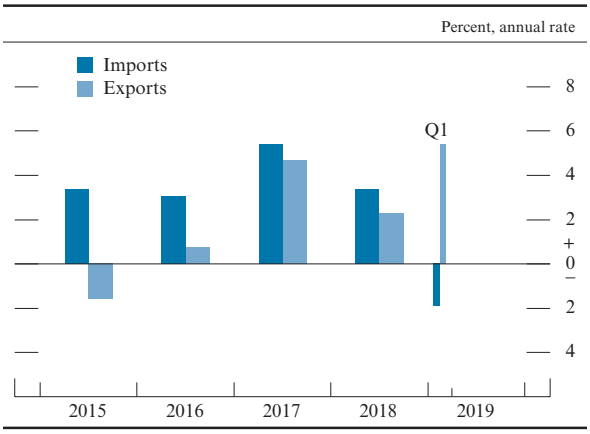
13. The Joint Committee on Taxation estimated that the Tax Cuts and Jobs Act would reduce average annual tax revenue by a little more than 1 percent of GDP starting in 2018 and for several years thereafter. This revenue estimate does not account for the potential macroeconomic effects of the legislation.

24. Selected components of net debt financing for nonfinancial businesses



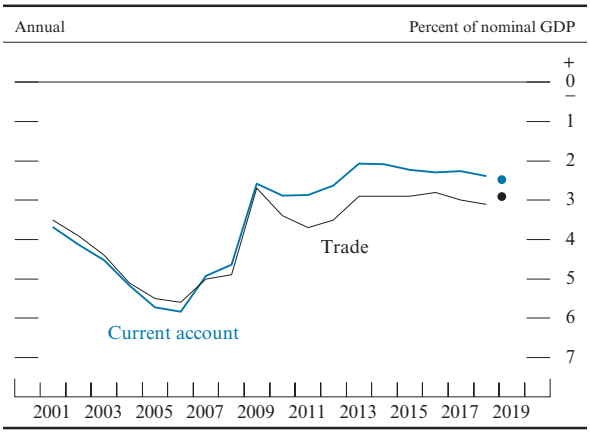
SOURCE: Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States."

25. Change in real imports and exports of goods and services



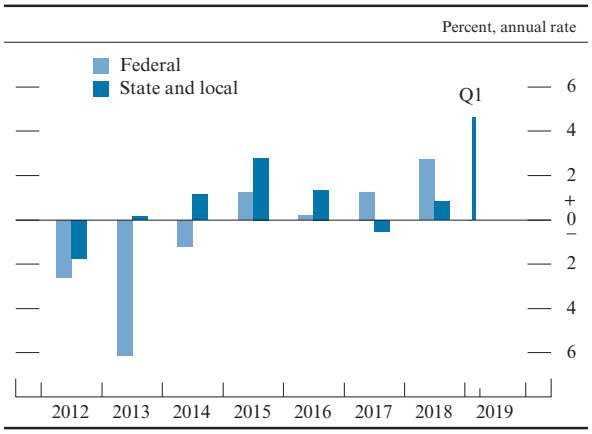
SOURCE: Bureau of Economic Analysis via Haver Analytics.

26. U.S. trade and current account balances



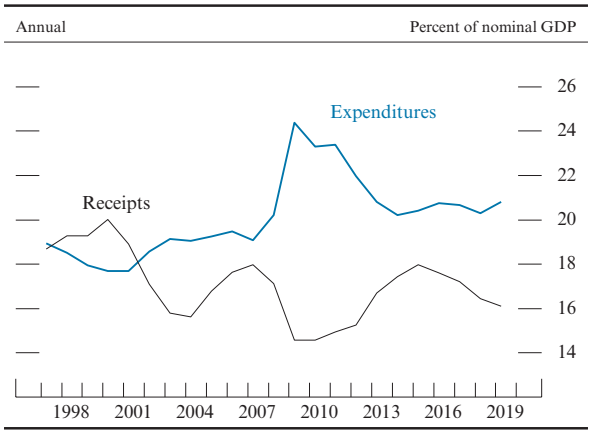
NOTE: GDP is gross domestic product. The dots refer to the current account and trade balances in the first quarter of 2019.
SOURCE: Bureau of Economic Analysis via Haver Analytics.

27. Change in real government expenditures on consumption and investment



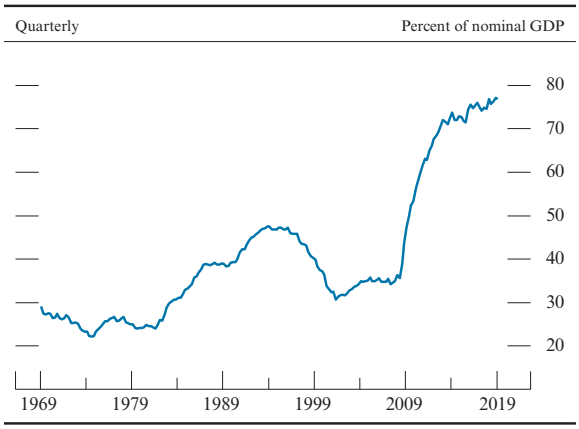
NOTE: The federal value for 2019:Q1 is -0.05.
SOURCE: Bureau of Economic Analysis via Haver Analytics.

28. Federal receipts and expenditures



NOTE: Through 2018, receipts and expenditures are for fiscal years (October to September); gross domestic product (GDP) is for the four quarters ending in Q3. For 2019, receipts and expenditures are for the 12 months ending in May; GDP is the average of 2018:Q4 and 2019:Q1. Receipts and expenditures are on a unified-budget basis.
SOURCE: Office of Management and Budget via Haver Analytics.

29. Federal government debt held by the public



NOTE: The data for gross domestic product (GDP) are at an annual rate. Federal debt held by the public equals federal debt less Treasury securities held in federal employee defined benefit retirement accounts, evaluated at the end of the quarter.
SOURCE: For GDP, Bureau of Economic Analysis via Haver Analytics; for federal debt, Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States."

of federal debt held by the public to nominal GDP rose to around 77 percent in fiscal 2018 and was quite elevated relative to historical norms (figure 29). The Congressional Budget Office projects that this ratio will rise further over the next several years.

. . . and the fiscal position of most state and local governments is stable

The fiscal position of most state and local governments is stable, although there is a range of experiences across these governments. The revenue of state governments has grown moderately in recent quarters, as the economic expansion continues to push up income and sales tax collections. At the local level, property tax collections continue to rise, pushed higher by past house price gains. Real state and local government purchases grew modestly last year; however, outlays have surged so far this year, driven largely by a boost in construction spending. State and local infrastructure spending was weak for many years, and there appears to be demand for higher expenditures in this area. State and local government payrolls expanded slowly last year and over the first five months of 2019, and employment by these governments remains below its peak before the current expansion.

Financial Developments

The expected path of the federal funds rate over the next several years has moved down

Market-based measures of the expected path for the federal funds rate over the next several years have declined substantially since the end of 2018 (figure 30). Various factors contributed to this shift, including increased investor concerns about downside risks to the global economic outlook and rising trade tensions. In addition, investors reportedly interpreted FOMC communications over the first half of 2019 as signaling the Federal Reserve is likely to lower the target range for the federal funds rate in light of muted

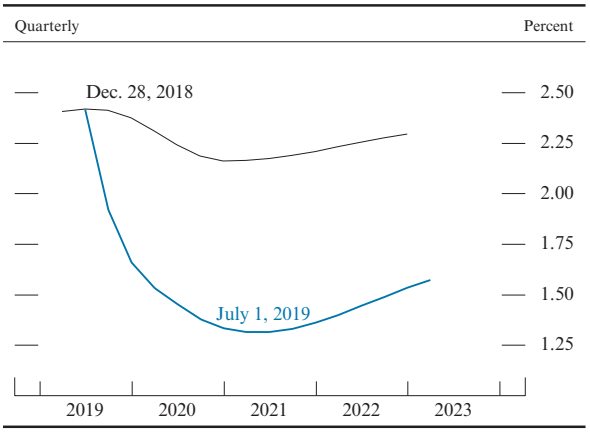
inflation pressures and uncertainties about the global economic outlook.

Survey-based measures of the expected path of the policy rate also shifted down relative to the levels observed at the end of 2018. According to the results of the most recent Survey of Primary Dealers and Survey of Market Participants, both conducted by the Federal Reserve Bank of New York just before the June FOMC meeting, the median of respondents' modal projections implies a declining trajectory for the target range of the federal funds rate for 2019, which flattens out in 2020. Relative to the December survey, the median of these projections moved down 50 basis points for July 2019 and 100 basis points for December 2019.[14] Additionally, market-based measures of uncertainty about the policy rate approximately one to two years ahead increased, on balance, from their levels at the end of last December.

The nominal Treasury yield curve has moved down and continued to flatten

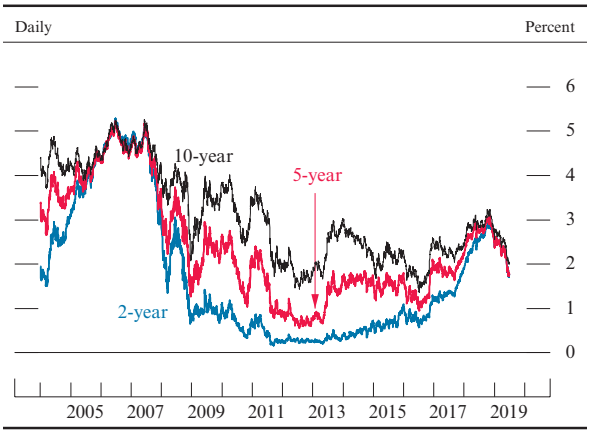
Since the end of 2018, the nominal Treasury yield curve shifted down and flattened further, with the 2-, 5-, and 10-year nominal Treasury yields all declining about 70 basis points on net (figure 31). The decrease in Treasury yields, which is consistent with the revision in market participants' expectations for the path of policy rates, largely reflects FOMC communications as well as investors' concerns about the global economic outlook and the escalation of trade disputes. Option-implied volatility on swap rates—an indicator of uncertainty about Treasury yields—has increased notably, on net, since the beginning of the year. In particular, measures of near-

30. Market-implied federal funds rate path



NOTE: The federal funds rate path is implied by quotes on overnight index swaps—a derivative contract tied to the effective federal funds rate. The implied path as of July 1, 2019, is compared with that as of December 28, 2018. The path is estimated with a spline approach, assuming a term premium of 0 basis points. The July 1, 2019, path extends through March 2023 and the December 28, 2018, path through December 2022.
SOURCE: Bloomberg; Federal Reserve Board staff estimates.

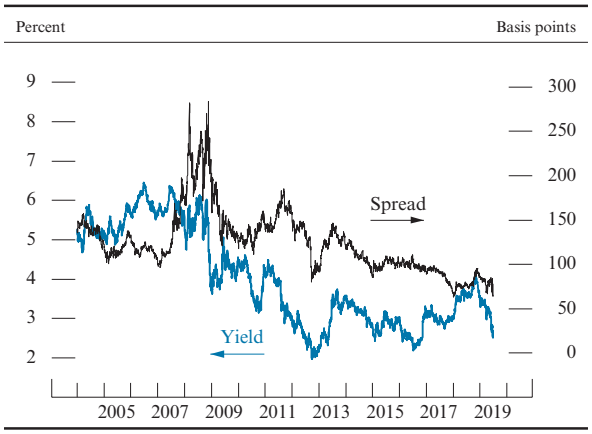
31. Yields on nominal Treasury securities



SOURCE: Department of the Treasury via Haver Analytics.

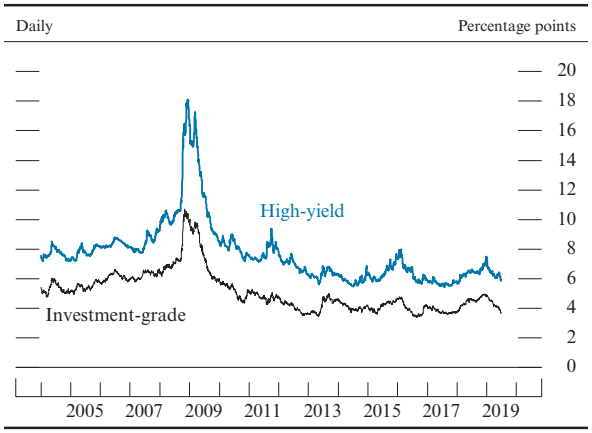
14. The results of the Survey of Primary Dealers and the Survey of Market Participants are available on the Federal Reserve Bank of New York's website at https://www.newyorkfed.org/markets/primarydealer_survey_questions.html and https://www.newyorkfed.org/markets/survey_market_participants, respectively.

32. Yield and spread on agency mortgage-backed securities



NOTE: The data are daily. Yield shown is for the Fannie Mae 30-year current coupon, the coupon rate at which new mortgage-backed securities would be priced at par, or face, value. Spread shown is to the average of the 5- and 10-year nominal Treasury yields. Data extend through June 26, 2019.
SOURCE: Department of the Treasury; Barclays Live.

33. Corporate bond yields, by securities rating



NOTE: Investment-grade is the 10-year triple-B, which reflects the effective yield of the ICE BofAML 7-to-10-year triple-B U.S. Corporate Index (C4A4). High-yield is the 10-year high-yield and reflects the effective yield of the ICE BofAML 7-to-10-year U.S. Cash Pay High Yield Index (J4A0). Data extend through June 26, 2019.
SOURCE: ICE Bank of America Merrill Lynch Indices, used with permission.

term interest rate uncertainty have reached the levels seen at the end of 2018.

Yields on 30-year agency mortgage-backed securities (MBS)—an important factor influencing mortgage interest rates—decreased in line with the decline in the 10-year nominal Treasury yield and remained low by historical standards (figure 32). Likewise, yields on both investment-grade and high-yield corporate debt declined significantly from the levels in late 2018 and stayed very low (figure 33). Despite widening in May, the spreads on corporate bond yields over comparable-maturity Treasury yields have narrowed, on net, over the first half of 2019 and are close to their historical medians.

Broad equity price indexes increased on net

After declining sharply at the end of 2018, broad U.S. stock market indexes have recovered, on net, over the first half of 2019 (figure 34). The broad rebound in stock prices—which included all major economic sectors—was reportedly supported by Federal Reserve communications that were perceived as more accommodative than previously anticipated. Stocks fluctuated in May and June as downside risks and trade tensions were offset by further expectations of easier monetary policy.

Measures of implied and realized stock price volatility for the S&P 500 index declined notably on net. Following the highs seen at the end of 2018, these volatility measures declined until late April, with the VIX—a measure of implied volatility—returning to near the 10th percentile of its historical distribution and with realized volatility close to the 30th percentile of its historical range (figure 35). At the beginning of May, following the escalation of trade tensions, these volatility measures increased and have remained elevated since then, but they have stayed well below the high levels of December and now stand close to their historical medians. Several measures of financial conditions that aggregate large sets

of financial data into summary indexes eased considerably since the end of 2018 but have tightened a bit since the beginning of May, in line with the decline in stock prices over that month, and have remained relatively elevated since then. (For a discussion of financial stability issues, see the box "Developments Related to Financial Stability.")

Markets for Treasury securities, mortgage-backed securities, and municipal bonds have functioned well

Available indicators of Treasury market functioning have generally remained stable since the beginning of 2019, with a variety of measures—including bid-ask spreads, bid sizes, and estimates of transaction costs—displaying few signs of liquidity pressures. Liquidity conditions in the agency MBS market were also generally stable. Credit conditions in municipal bond markets remained stable as well, with yield spreads on 20-year general obligation municipal bonds over comparable-maturity Treasury securities declining somewhat on net.

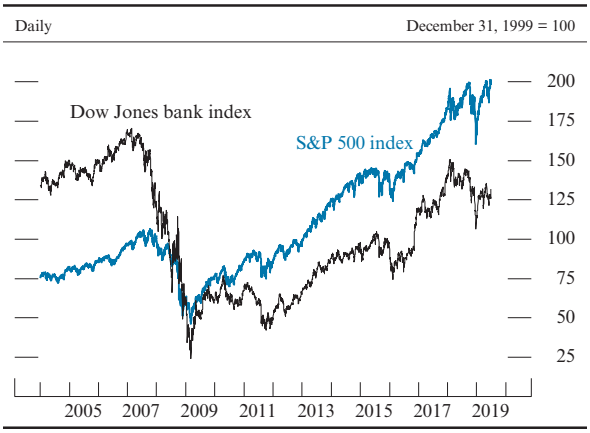
Money market rates were little changed

Rates across money markets were little changed, on balance, in the first half of 2019. Conditions in domestic short-term funding markets continued to be broadly stable since the end of 2018. Overnight secured and unsecured rates declined in line with the technical adjustment announced after the May FOMC meeting, which lowered the interests paid on required and excess reserve balances by 5 basis points. Other short-term interest rates, including those on commercial paper and negotiable certificates of deposit, were also little changed since the beginning of the year.

Bank credit continued to expand, and bank profitability remained robust

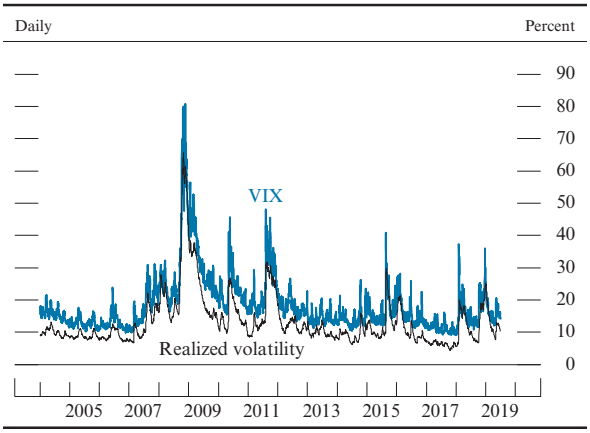
Credit provided by commercial banks to fund businesses as well as commercial and residential real estate continued to grow in 2019, albeit at a slower pace than in the second

34. Equity prices



SOURCE: Standard & Poor's Dow Jones Indices via Bloomberg. (For Dow Jones Indices licensing information, see the note on the Contents page.)

35. S&P 500 volatility



NOTE: The VIX is a measure of implied volatility that represents the expected annualized change in the S&P 500 index over the following 30 days. For realized volatility, five-minute S&P 500 returns are used in an exponentially weighted moving average with 75 percent of weight distributed over the past 20 days.

SOURCE: Cboe Volatility Index® (VIX®) accessed via Bloomberg; Federal Reserve Board staff estimates.

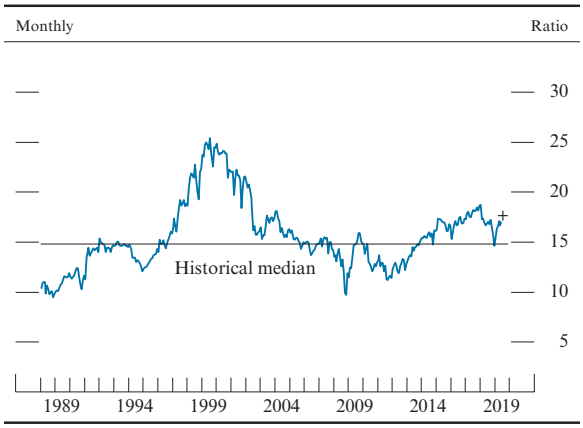
Developments Related to Financial Stability

The framework used by the Federal Reserve Board for assessing the resilience of the U.S. financial system focuses on financial vulnerabilities in four broad areas: asset valuations, household and business debt, leverage in the financial sector, and funding risks. The *Financial Stability Report* published on May 6, 2019, presents the most recent, detailed assessment of these vulnerabilities.[1] This discussion summarizes its key findings, updated, where appropriate, to reflect developments since its publication.

Asset valuations remain somewhat elevated in a number of markets. Treasury term premiums are near record lows. Forward-looking measures of Treasury market volatility have recently increased, especially for shorter-dated Treasury securities. Equity prices appear to be somewhat elevated relative to earnings, with the forward equity price-to-earnings ratio for the S&P 500 remaining above the median value of its historical distribution since the mid-1980s (figure A). In commercial real estate markets, capitalization rates remain at historically low levels. Residential real estate prices are also somewhat high relative to rents (accounting for borrowing costs and long-run trends), although house price growth slowed materially in the past year. Valuation pressures in the leveraged loan market eased somewhat in recent months, and the spreads on lower-rated leveraged loans are now above the median value over the past 20 years. In corporate bond markets, spreads of 10-year corporate bonds over benchmark rates are close to the median of their historical distributions.

Vulnerabilities associated with total private-sector credit remain at a moderate level relative to the past several decades, and total debt has advanced roughly in line with economic activity over the past five years. Leverage in the business sector remains near its highest level in the past 20 years, and business debt has grown faster than gross domestic product (GDP) since 2012

A. Forward price-to-earnings ratio of S&P 500 firms



NOTE: Aggregate forward price-to-earnings ratio of S&P 500 firms. Data are based on expected earnings for 12 months ahead and extend through June 2019. The plus sign shows daily data corresponding to July 1, 2019.

SOURCE: Federal Reserve Board staff calculations using Refinitiv (formerly Thomson Reuters), IBES Estimates.

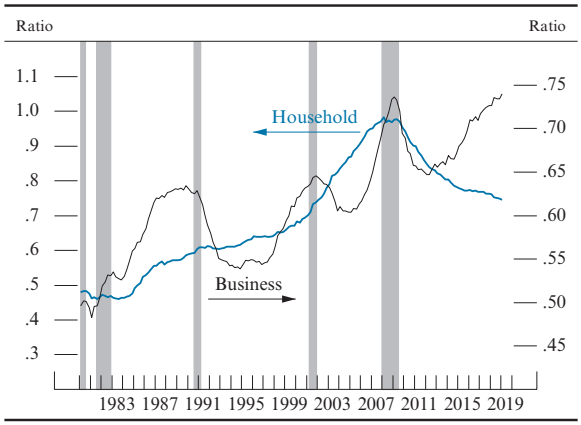
(figure B). Rapid debt growth, while broad based across different parts of the business sector, is concentrated among the riskiest firms, and there are signs that credit standards for new leveraged loans are weak and have deteriorated further over the past six months. In the corporate bond market, the distribution of credit ratings among investment-grade bonds has worsened, with the share of bonds rated Baa (or triple-B) reaching near-record levels. While broader corporate credit performance remains solid amid a growing economy and debt-service costs are relatively low, a broader repricing of risk or a slowdown in economic activity could pose notable risks to borrowing firms and their creditors. Such developments could increase the downside risk to economic activity more generally. In contrast, in the household sector, debt growth is concentrated among borrowers with high credit scores, and the debt-to-GDP ratio continues to trend down (figure B).

Vulnerabilities stemming from leverage at financial institutions remain low. Capital relative to risk-weighted

(continued)

1. See Board of Governors of the Federal Reserve System (2019), *Financial Stability Report* (Washington: Board of Governors, May), https://www.federalreserve.gov/publications/2019-may-financial-stability-report-purpose.htm.

B. Business- and household-sector credit-to-GDP ratio



NOTE: Data are quarterly. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research. GDP is gross domestic product.

SOURCE: Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States"; Bureau of Economic Analysis via Haver Analytics, national income and product accounts, Table 1.1.5: Gross Domestic Product; Board staff calculations.

assets at the largest banks has remained largely stable over the past few years. Results of the annual Dodd-Frank Act Stress Tests, released on June 21, 2019, indicate that participating banks are sufficiently resilient to continue lending to creditworthy borrowers even in a severe macroeconomic scenario. The exposure of banks to nonbank financial institutions—such as finance companies, asset managers, securitization vehicles, and mortgage real estate investment trusts—continued to increase in the first quarter of 2019. Some of those firms are significant business lenders, adding to banks' exposure to elevated losses in the corporate sector. Leverage of broker-dealers increased slightly in 2018 but remains near historically low levels. Leverage has also stayed low at life insurance companies and at property and casualty insurance firms. At hedge funds, leverage increased in the first quarter of 2019 to levels slightly below its 2018 peak.

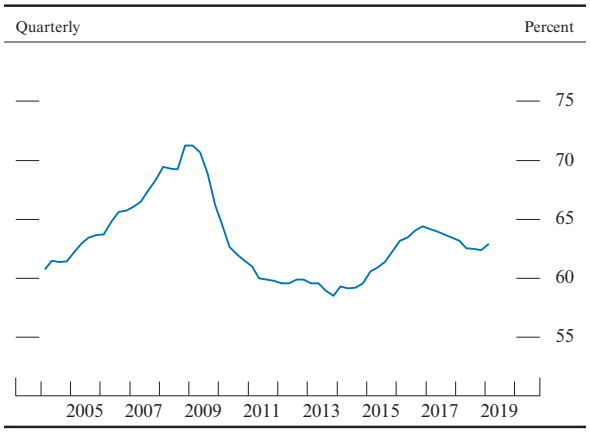
Vulnerabilities stemming from liquidity and maturity mismatches remain low. Banks hold large quantities of liquid assets, and their reliance on short-term wholesale funding is near its historical lows. Although assets under management at prime money market funds—which are more susceptible to runs than government funds—have increased since the U.S. Securities and Exchange Commission (SEC) reforms went into place in 2016, they remain well below their pre-reform levels. Holdings of U.S. corporate bonds by mutual funds increased substantially over the past decade, raising concerns about the mismatch between daily redemptions allowed by these funds and the time required to sell their assets. Rules adopted in 2016 by the SEC to strengthen mutual funds' and exchange-traded funds' liquidity risk management have started going into effect in the past year.[2]

Downside risks to U.S. financial stability from abroad remain moderate, but several near-term risk events could generate meaningful spillovers to the United States. Two prominent European risks are a "no deal" Brexit, which remains a possible outcome later in the year, and Italian fiscal challenges. Also, an escalation of the trade tensions between the United States and its major trading partners, along with financial market reactions, could exacerbate uncertainty and increase the downside risk to global economic activity. In China, high levels of nonfinancial-sector debt expose the financial sector to a slowdown in economic growth. The effects of any of these events on global financial markets could be amplified if they deepen the stresses in already vulnerable emerging market economies. These dynamics could tighten financial conditions in the United States and negatively affect the creditworthiness of U.S. firms.

The countercyclical capital buffer (CCyB) is a macroprudential tool that the Federal Reserve can use to increase the resilience of the financial system by raising capital requirements on internationally active banking organizations when financial vulnerabilities are meaningfully above normal. On March 6, 2019, the Board voted to maintain the CCyB at 0 percent.

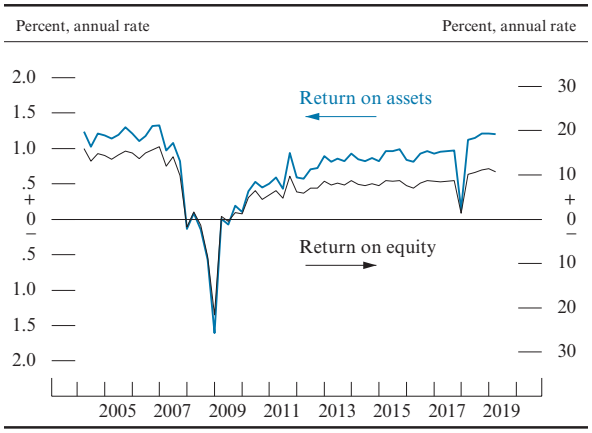
2. See Securities and Exchange Commission (2016), "Investment Company Liquidity Risk Management Programs," final rule, 17 C.F.R. pts. 210, 270, and 274, October 13, https://www.sec.gov/rules/final/2016/33-10233.pdf.

36. Ratio of total commercial bank credit to nominal gross domestic product



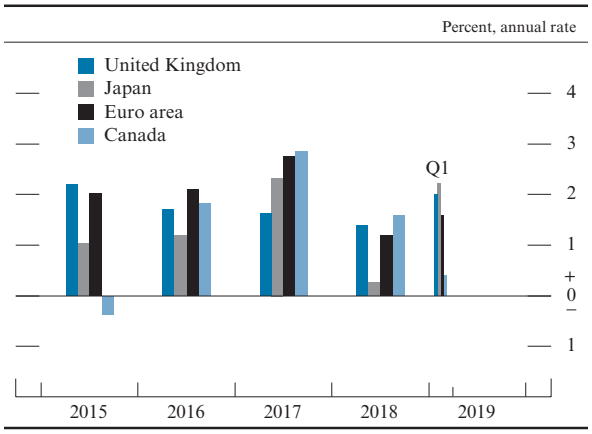
SOURCE: Federal Reserve Board, Statistical Release H.8, "Assets and Liabilities of Commercial Banks in the United States"; Bureau of Economic Analysis via Haver Analytics.

37. Profitability of bank holding companies



NOTE: The data are quarterly and are seasonally adjusted.
SOURCE: Federal Reserve Board, Form FR Y-9C, Consolidated Financial Statements for Bank Holding Companies.

38. Real gross domestic product growth in selected advanced foreign economies



SOURCE: For the United Kingdom, Office for National Statistics; for Japan, Cabinet Office, Government of Japan; for the euro area, Eurostat; for Canada, Statistics Canada; all via Haver Analytics.

half of 2018. By contrast, consumer loan growth accelerated since the beginning of the year. In the first quarter of 2019, the pace of total bank credit expansion was about in line with that of nominal GDP, leaving the ratio of total commercial bank credit to current-dollar GDP little changed relative to last December (figure 36). Overall, measures of bank profitability remained solid in the first quarter of 2019, supported by wider net interest margins and steady loan growth (figure 37).

International Developments

Advanced foreign economies have been slowly emerging from the recent soft patch

After a significant slowdown in the second half of last year, growth picked up in many advanced foreign economies (AFEs) at the start of 2019, but at a still restrained pace (figure 38). Notwithstanding continued weakness in the manufacturing sector and softening external demand, domestic demand in the AFEs generally improved amid rising employment and wages as well as easier financial conditions. The pickup in growth also reflected temporary factors. Economic activity in the euro area was boosted by the fading effects of car production disruptions in Germany and protests in France in 2018. Growth in the United Kingdom surged as expectations of trade disruptions surrounding the original date of the United Kingdom's exit from the European Union, or Brexit, led to stockpiling by households and firms. Economic activity in Canada, by contrast, remained depressed by oil production cuts, but recent indicators point to a rebound in growth in the second quarter.

Core inflation remained low in advanced foreign economies

The rebound in energy prices earlier in the year pushed up consumer price inflation in many AFEs (figure 39). However, despite further

improvement in labor market conditions, inflationary pressures remained contained, with core inflation readings notably muted in the euro area and Japan. In Canada and the United Kingdom, by contrast, core inflation rates moved close to 2 percent.

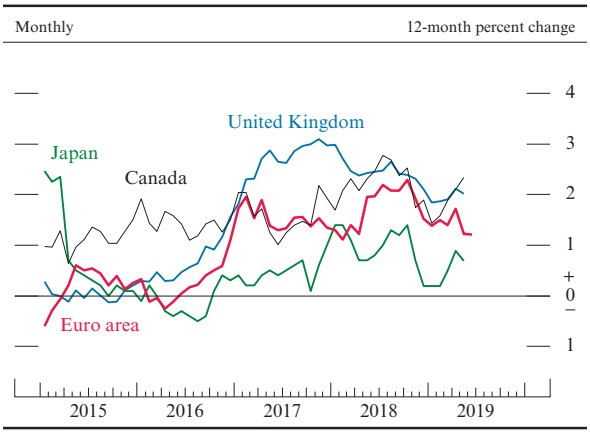
AFE central banks took a more accommodative policy stance

With activity only slowly picking up and core inflation persistently low, European Central Bank (ECB) communications took a more accommodative tone. In March, the ECB indicated that it would keep its policy rate in negative territory through at least the middle of next year and rolled out a new round of loans for euro-area banks to reduce the risk of renewed funding pressures. In June, ECB President Mario Draghi added that the ECB would introduce new stimulus measures if the economic outlook did not improve. The Bank of Canada and Bank of England signaled more-gradual increases in interest rates, given a moderation in the pace of global economic activity. The Reserve Bank of Australia in June and July cut its policy rate in response to below-target inflation and weak economic growth.

Central banks' more accommodative policy stances supported AFE asset prices

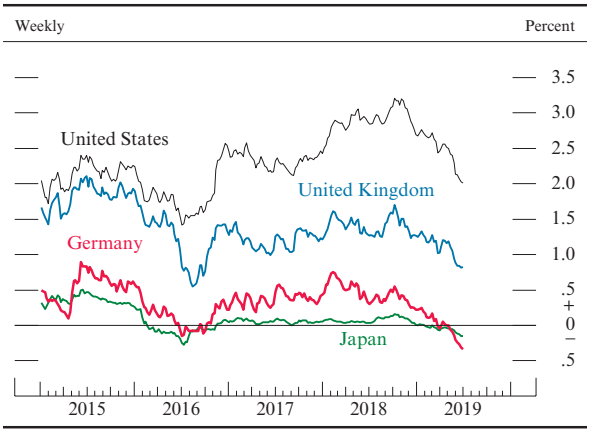
The more accommodative policy stance in major AFEs contributed to an overall easing of financial conditions in the first half of the year. Market-implied paths of policy rates and long-term interest rates on sovereign bonds have generally fallen sharply, as in the United States (figure 40). Broad stock market indexes across AFEs are up, on net, since January (figure 41). However, concerns about global growth and rising trade tensions weighed on risky asset prices over the course of May and June. Sovereign bond spreads in Italy fluctuated amid uncertainty about the country's fiscal outlook.

39. Consumer price inflation in selected advanced foreign economies



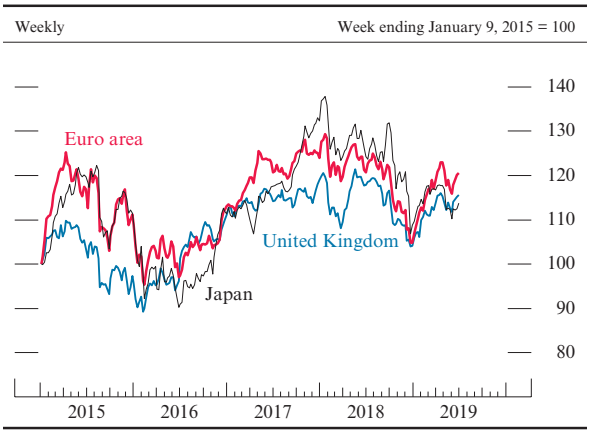
NOTE: The data for the euro area incorporate the flash estimate for June 2019.
SOURCE: For the United Kingdom, Office for National Statistics; for Japan, Ministry of International Affairs and Communications; for the euro area, Statistical Office of the European Communities; for Canada, Statistics Canada; all via Haver Analytics.

40. Nominal 10-year government bond yields in selected advanced economies



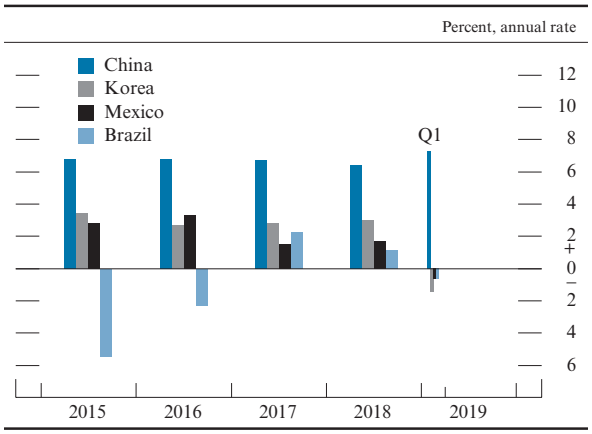
NOTE: The data are weekly averages of daily benchmark yields. The weekly data begin on Thursdays and extend through July 1, 2019.
SOURCE: Bloomberg.

41. Equity indexes for selected foreign economies



NOTE: The data are weekly averages of daily data. The weekly data begin on Thursdays and extend through July 1, 2019.
SOURCE: For euro area, DJ Euro Stoxx Index; for Japan, TOPIX Stock Index; for United Kingdom, FTSE 100 Stock Index; all via Bloomberg.

42. Real gross domestic product growth in selected emerging market economies



NOTE: The data for China are seasonally adjusted by Board staff. The data for Korea, Mexico, and Brazil are seasonally adjusted by their respective government agencies.

SOURCE: For China, China National Bureau of Statistics; for Korea, Bank of Korea; for Mexico, Instituto Nacional de Estadistica y Geografia; for Brazil, Instituto Brasileiro de Geografia e Estatistica; all via Haver Analytics.

Economic activity in emerging Asia struggled to gain a solid footing

In China, real GDP growth picked up in the first quarter, supported in part by fiscal and monetary policy measures that targeted smaller businesses and infrastructure spending, as well as by the more favorable financial conditions amid investor optimism on a U.S.–China trade deal (figure 42). Recent activity indicators, however, suggest that the underlying momentum in the economy remains relatively subdued against the backdrop of reemerging trade tensions, global weakness in trade and manufacturing, and the Chinese authorities' continued caution about providing substantial further credit stimulus. Amid moderating global trade and activity, real GDP growth in other Asian economies in the first quarter generally remained below their 2018 pace, with growth in Korea turning negative (see the box "The Persistent Slowdown in Global Trade and Manufacturing").

Latin American economies continued to underperform

In Mexico, real GDP contracted in the first quarter following generally weak performance in the past two years. Tighter fiscal policy and disruptions from labor unrest weighed on activity amid a backdrop of softening U.S. manufacturing demand and persistent declines in petroleum production. Recent indicators suggest some improvement in the second quarter, although uncertainty regarding trade relations with the United States appears to have increased. In Brazil, real GDP also contracted in the first quarter, as a mining disaster and ongoing weakness in the Argentine economy weighed on Brazilian economic activity. Investment continued to decline, held down by uncertainty over whether Brazil's government would enact major fiscal and other economic reforms.

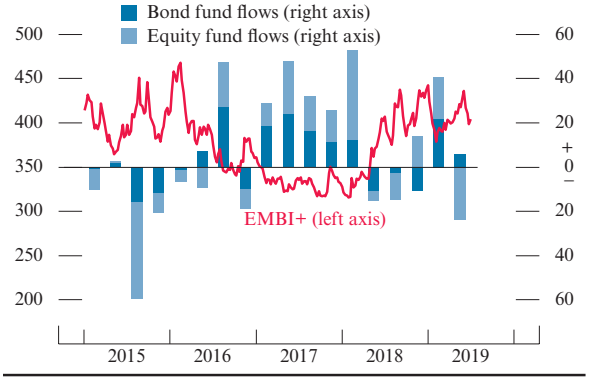
Financial conditions in many emerging market economies improved, on net, despite the reemergence of trade tensions

Financial conditions in many emerging market economies (EMEs) eased earlier in the year in response to the more accommodative policy stance of the Federal Reserve and major AFE central banks. However, in recent months, political uncertainties in some EMEs and renewed trade tensions between the United States and major trading partners have weighed on EME asset prices. On net, broad measures of EME sovereign bond spreads over U.S. Treasury rates are down a little, while benchmark EME equity indexes are a bit higher since the beginning of the year. Flows to dedicated EME mutual funds increased earlier in the year but turned negative in the second quarter (figure 43). While deteriorations in asset prices and capital flows have been sizable for some economies, particularly Turkey and Argentina, broad indicators of financial stress in EMEs are below those seen during other periods of significant stress in recent years.

The dollar depreciated a little

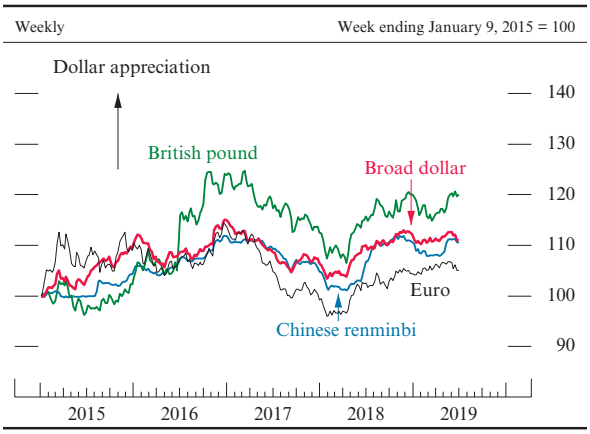
Over the first half of the year, the foreign exchange value of the U.S. dollar fluctuated but was, on net, a little lower (figure 44). Increased investor optimism about prospects for trade negotiations early this year as well as downward-revised expectations for U.S. interest rates led to a depreciation of the dollar. But the more accommodative tone of communications from major foreign central banks and safe-haven flows—in part in response to trade tensions and concerns about global growth—helped push the dollar up. In addition, the Chinese renminbi has come under some downward pressure since trade tensions escalated in recent months.

43. Emerging market mutual fund flows and spreads



NOTE: The bond and equity fund flows data are quarterly sums of weekly data from January 1, 2015, to June 26, 2019. The fund flows data exclude funds located in China. The J.P. Morgan Emerging Markets Bond Index Plus (EMBI+) data are weekly averages of daily data. The weekly data begin on Thursdays and extend through June 28, 2019.
SOURCE: For bond and equity fund flows, EPFR Global; for EMBI+, J.P. Morgan Emerging Markets Bond Index Plus via Bloomberg.

44. U.S. dollar exchange rate indexes



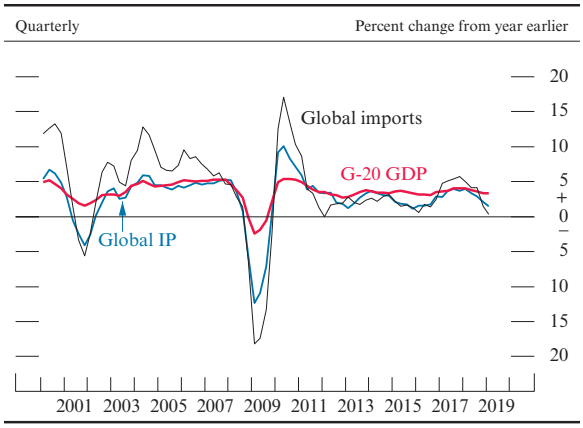
NOTE: The data, which are in foreign currency units per dollar, are weekly averages of daily data. The weekly data begin on Thursdays and extend through July 1, 2019. As indicated by the arrow, increases in the data represent U.S. dollar appreciation, and decreases represent U.S. dollar depreciation.
SOURCE: Federal Reserve Board, Statistical Release H.10, "Foreign Exchange Rates."

The Persistent Slowdown in Global Trade and Manufacturing

After expanding briskly in 2017, the growth of global goods trade and manufacturing, as indicated by industrial production, has slowed significantly (figure A). Even so, other aspects of economic activity, importantly services, have held up. A number of factors are likely contributing to the recent slowdown in trade and manufacturing growth, and disentangling them is difficult. First, new tariffs appear to have lowered imports and exports in the United States and elsewhere, while uncertainty surrounding trade policy could be leading firms to delay investment decisions and reduce capital expenditures. Second, a downturn in global sales for technology goods has restrained trade and manufacturing activity, especially in emerging Asia. Finally, a general slowdown in global demand, reflecting idiosyncratic factors specific to different economies, has likely weighed on demand for traded goods.

Regarding the first of these factors, global trade tensions have risen sharply since early 2018, fueled by both higher tariffs and uncertainty about the prospects for future trade policy. The United States has increased tariffs on over $250 billion in imports by an average of nearly 25 percentage points, and U.S. trading partners have retaliated. Several studies indicate that most of the cost of these higher tariffs has been passed through to U.S. importers.[1] If we assume a commonly used elasticity of 1.5 for the response of imports to changes in prices, it implies that tariffs may have lowered U.S. imports by about $70 billion, or about 0.5 percent of world goods imports.[2] Taking into account the effect of higher tariffs imposed by foreign countries as well, these estimates suggest that the overall direct effects of higher tariffs on global trade flows are, to date, likely to be material but modest relative to the observed step-down from 5.7 percent growth in 2017 to 1.5 percent growth in 2018.

A. Change in global trade, industrial production, and GDP



NOTE: Imports and industrial production (IP) are quarterly averages of monthly data. G-20 GDP is seasonally adjusted gross domestic product (GDP) volume estimates at 2010 purchasing power parities (PPPs) for the Group of 20 economies.

SOURCE: Netherlands Bureau for Economic Policy Analysis via Haver Analytics; Organisation for Economic Co-operation and Development, OECD.Stat.

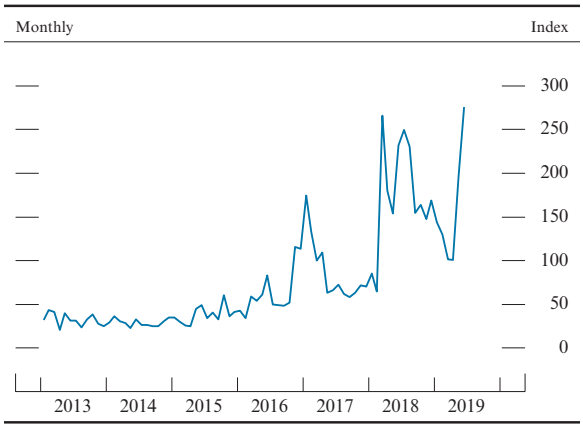
In addition to the direct effect of the tariffs, however, rising uncertainty about the prospects for trade policy may also be weighing on trade and manufacturing. Measures of trade policy uncertainty spiked last year, largely reflecting concerns about current and prospective tariff hikes along with renegotiations of trade agreements (figure B). Higher uncertainty may lead businesses to delay investment purchases as they wait for the policy uncertainties to be resolved. Indeed,

(continued)

1. For two recent working papers that analyze the effects of the tariff changes on trade volumes and import prices, see Mary Amiti, Stephen J. Redding, and David E. Weinstein (2019), "The Impact of the 2018 Trade War on U.S. Prices and Welfare," CEPR Discussion Paper DP13564 (London: Centre for Economic Policy Research, March), https://cepr.org/sites/default/files/news/FreeDP_Mar05.pdf; and Pablo D. Fajgelbaum, Pinelopi K. Goldberg, Patrick J. Kennedy, and Amit K. Khandelwal (2019), "The Return to Protectionism," NBER Working Paper Series 25638 (Cambridge, Mass.: National Bureau of Economic Research, March).

2. See David K. Backus, Patrick J. Kehoe, and Finn E. Kydland (1994), "Dynamics of the Trade Balance and the Terms of Trade: The J-Curve?" *American Economic Review,* vol. 84 (March), pp. 84–103.

B. Trade policy uncertainty



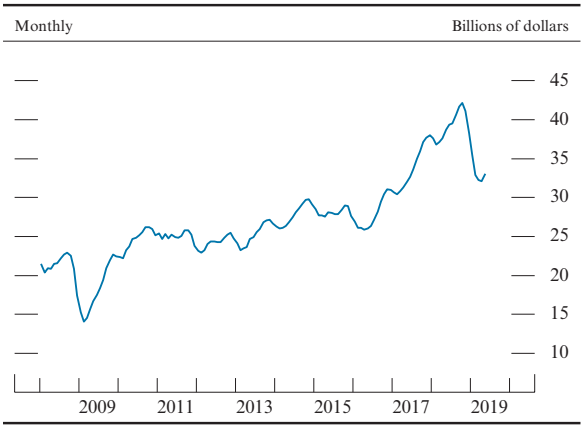
NOTE: The data extend through June 2019. At an index value of 100, 1 percent of news articles contain references to trade policy uncertainty.
SOURCE: Dario Caldara, Matteo Iacoviello, Patrick Molligo, Andrea Prestipino, and Andrea Raffo (2019), "The Economic Effects of Trade Policy Uncertainty," manuscript presented at the 91st meeting of the Carnegie-Rochester-NYU Conference on Public Policy, held at New York University, New York, April 12–13.

investment spending growth has slowed in many areas of the global economy since 2017. Although this slowdown may reflect a number of factors, concerns about trade policy have been flagged in many recent surveys of business attitudes and intentions, including the Beige Book.

The global tech cycle—a synchronized pattern of production and trade in electronics and software across economies—has also contributed to the decline in global trade and manufacturing growth. This cycle is particularly important for emerging Asia, where about one-third of exports are technology related. Global semiconductor sales surged in 2017 but fell sharply in the last months of 2018 (figure C). The fall in large part reflected a contraction in demand in China, particularly evident in mobile phone purchases. Recent data, however, suggest that this cycle may have bottomed out, as Chinese mobile phone production picked up in April along with exports of electronics in emerging Asia through May.

Finally, a regular feature of the data is that trade and manufacturing production move with overall gross domestic product (GDP) growth but with considerably more cyclical volatility (a pattern that can be seen in figure A). Trade and manufacturing production largely consist of durable goods, the purchase of which tends to be especially sensitive to economic conditions. Thus, although global trade and manufacturing slowed much more sharply than GDP last year, part of their sharp slowing likely just reflected a response to a more general slowing in global economic growth. A number of factors have contributed to the step-down in global activity. A deleveraging campaign by China's authorities was an important factor in the slowdown of the Chinese economy. Growth in Europe has been restrained by complications with meeting tighter emissions standards for new motor vehicles in Germany, protests in France, and the ongoing uncertainties associated with Brexit. And financial stresses have weighed on some emerging market economies, especially Argentina and Turkey.

C. Global semiconductor sales



NOTE: The semiconductor data are 3-month moving averages.
SOURCE: Semiconductor Industry Association via Haver Analytics.

Part 2
Monetary Policy

The FOMC maintained its target range for the federal funds rate

From late 2015 through the end of 2018, the Federal Open Market Committee (FOMC) gradually increased its target range for the federal funds rate as the economy continued to make progress toward the Committee's congressionally mandated objectives of maximum employment and price stability. In its meetings over the first half of 2019, the Committee judged that the stance of monetary policy was appropriate to achieve its dual mandate, and it decided to maintain the target range for the federal funds rate at 2¼ to 2½ percent (figure 45). These decisions reflected incoming information showing the solid fundamentals of the U.S. economy supporting continued growth and strong employment.

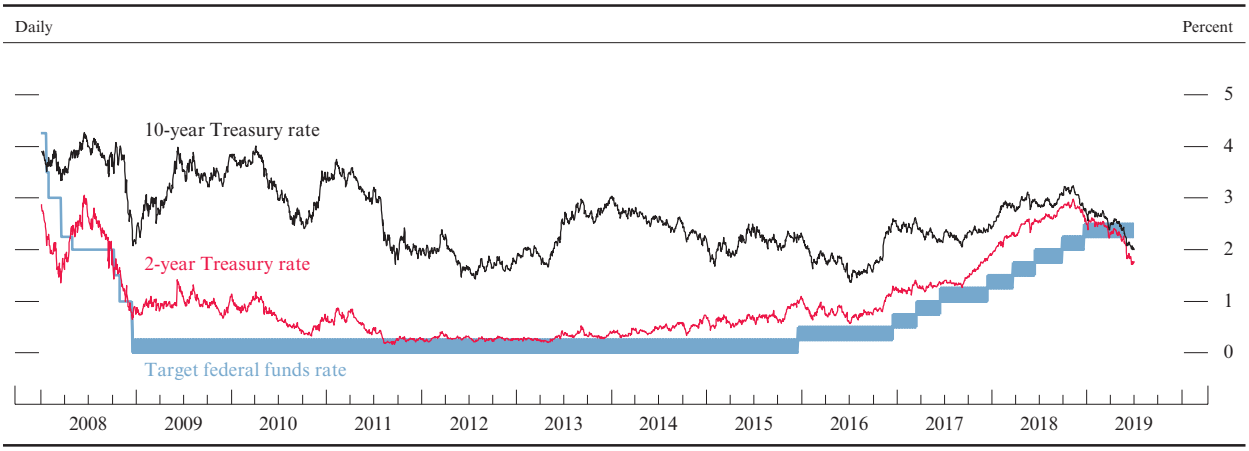
Looking ahead, the FOMC will act as appropriate to sustain the expansion, with a strong labor market and inflation near its 2 percent objective

At its meetings since the beginning of the year, the Committee stated that it continued to view a sustained expansion of economic activity, strong labor market conditions, and inflation near the Committee's symmetric 2 percent objective as the most likely outcomes. For much of this period, the Committee indicated that, in light of global economic and financial developments and muted inflation pressures, it would be patient as it determines what future adjustments to the target range for the federal funds rate may be appropriate to support these outcomes.

At the June meeting, however, the Committee noted that uncertainties about the outlook had increased.[15] Since the beginning of May, the tenor of incoming information on economic activity, on balance, has become somewhat more downbeat, and uncertainties about the economic outlook have increased. Growth indicators from around the world have disappointed, on net, raising concerns about the strength of the global economy. Meanwhile, contacts in business and agriculture have reported heightened concerns over trade developments. In light of these uncertainties and muted inflation pressures,

15. See the FOMC statement issued after the June meeting, which is available on the Monetary Policy portion of the Board's website at https://www.federalreserve.gov/monetarypolicy.htm.

45. Selected interest rates



Note: The 2-year and 10-year Treasury rates are the constant-maturity yields based on the most actively traded securities.
Source: Department of the Treasury; Federal Reserve Board.

the Committee indicated that it will act as appropriate to sustain the expansion, with a strong labor market and inflation near its objective. The Committee is firmly committed to its symmetric 2 percent inflation objective. In the Committee's economic projections released after the June meeting, participants generally revised down their individual assessments of the appropriate path for the policy rate from their assessments at the time of the March meeting (see Part 3 of this report for more details).

Future changes in the federal funds rate will depend on the economic outlook and risks to the outlook as informed by incoming data

The FOMC has continued to emphasize that the actual path of monetary policy will depend on the evolution of the economic outlook and risks to the outlook as informed by incoming data. Specifically, in deciding on 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 symmetric 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.

In addition to weighing a wide range of economic and financial data and information received from business contacts and other informed parties around the country, policymakers regularly consult prescriptions for the interest rate arising from various monetary policy rules. These rule prescriptions can serve as useful guidelines to the FOMC in the course of arriving at its policy decisions. Nonetheless, numerous practical considerations make clear that the FOMC cannot mechanically set the policy rate by following the prescriptions of any specific rule. The FOMC's framework for conducting monetary policy involves a systematic approach in keeping with key principles of good monetary policy but allows for more flexibility than is implied by simple policy rules (see the box "Monetary Policy Rules and Their Interactions with the Economy").

Since the beginning of the year, the FOMC has issued two statements regarding monetary policy implementation and balance sheet normalization

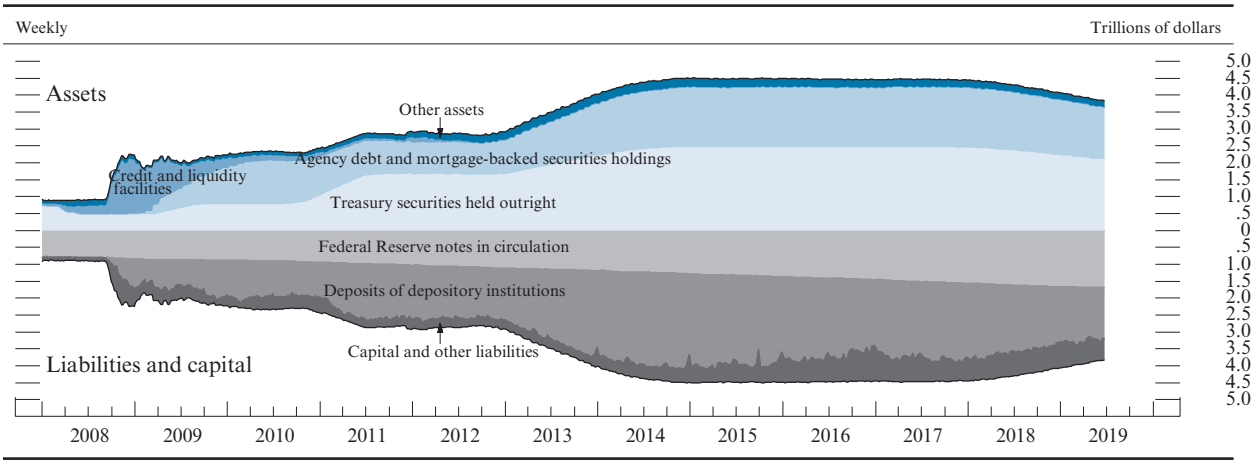
At its January meeting, the Committee indicated that it intends to continue to implement monetary policy in a regime in which the provision of an ample supply of reserves ensures that control over the level of the federal funds rate and other short-term interest rates is exercised primarily through the setting of the Federal Reserve's administered rates, and in which active management of the supply of reserves is not required.[16] After the March FOMC meeting, the Committee issued a statement indicating that it plans to conclude the reduction of the Federal Reserve's securities holdings at the end of September.[17] (The box "Framework for Monetary Policy Implementation and Normalization of the Federal Reserve's Balance Sheet" details the recent decision about policy implementation and balance sheet normalization.)

The Committee is prepared to adjust the details for completing balance sheet normalization in light of economic and financial developments, consistent with its congressionally mandated objectives of maximum employment and price stability.

16. See the Statement Regarding Monetary Policy Implementation and Balance Sheet Normalization, which is available on the Board's website at https://www.federalreserve.gov/monetarypolicy/policy-normalization.htm.

17. See the Balance Sheet Normalization Principles and Plans, which can be found on the Board's website at https://www.federalreserve.gov/monetarypolicy/policy-normalization.htm.

46. Federal Reserve assets and liabilities



NOTE: "Credit and liquidity facilities" consists of primary, secondary, and seasonal credit; term auction credit; central bank liquidity swaps; support for Maiden Lane, Bear Stearns, and AIG; and other credit facilities, including the Primary Dealer Credit Facility, the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility, the Commercial Paper Funding Facility, and the Term Asset-Backed Securities Loan Facility. "Other assets" includes unamortized premiums and discounts on securities held outright. "Capital and other liabilities" includes reverse repurchase agreements, the U.S. Treasury General Account, and the U.S. Treasury Supplementary Financing Account. The data extend through June 26, 2019.

SOURCE: Federal Reserve Board, Statistical Release H.4.1, "Factors Affecting Reserve Balances."

The Federal Reserve's total assets have continued to decline from about $4.1 trillion last December to about $3.8 trillion at present, with holdings of Treasury securities at approximately $2.1 trillion and holdings of agency debt and agency mortgage-backed securities at approximately $1.5 trillion (figure 46).

As the Federal Reserve has continued to gradually reduce its securities holdings, the level of reserve balances in the banking system has declined. In particular, the level of reserve balances has decreased by about $150 billion since the end of last year and by about $1.3 trillion since its peak in 2014.[18]

Meanwhile, interest income on the Federal Reserve's securities holdings has continued to result in sizable remittances to the U.S. Treasury. Preliminary data indicate that the Federal Reserve remitted about $27 billion in the first half of 2019.

The Federal Reserve's implementation of monetary policy has continued smoothly

Since the middle of March, the effective federal funds rate has traded slightly above the interest rate paid on reserve balances. At the May meeting, the Federal Reserve made a third small technical adjustment to lower the setting of the interest rate on excess reserves by 5 basis points to a level 15 basis points below the top of the target range for the federal funds rate; this adjustment successfully fostered trading in the federal funds market at rates well within the FOMC's target range.* Overall, rates across money markets were broadly stable since the beginning of 2019, and the usage of the overnight reverse repurchase agreement facility has remained low.

The Federal Reserve has started the review of its strategic framework for monetary policy

With labor market conditions close to maximum employment and inflation near

18. Since the start of the normalization program, reserve balances have dropped by approximately $700 billion.

* On July 8, 2019, the sentence was corrected to replace "the Committee" with "the Federal Reserve."

the Committee's 2 percent objective, the FOMC judged it an appropriate time for the Federal Reserve to conduct a public review of its strategic framework for monetary policy—including the policy strategy, tools, and communication practices. The goal of this assessment is to identify possible ways to improve the Committee's current policy framework in order to ensure that the Federal Reserve is best positioned going forward to achieve its statutory mandate of maximum employment and price stability.

The review includes outreach to and consultation with a broad range of people and groups interested in the U.S. economy. The Federal Reserve System is currently conducting a series of Fed Listens events around the country, typically with a town hall format, to hear perspectives from representatives of business and industry, labor leaders, community and economic development officials, academics, nonprofit organization executives, and others. Policymakers plan to report their findings to the public during the first half of 2020.

Monetary Policy Rules and Their Interactions with the Economy

Monetary policy rules are mathematical formulas that relate a policy interest rate, such as the federal funds rate, to a small number of other economic variables—typically including the deviation of inflation from its target value and a measure of resource slack in the economy. The prescriptions for the policy interest rate from these rules can provide helpful guidance for the Federal Open Market Committee (FOMC). This discussion presents five policy rules—illustrative of the many rules that have received attention in the research literature—and provides examples of two ways to compute historical prescriptions of policy rules. The two ways differ in terms of whether the implications of the rule prescriptions feed through to the macroeconomy and potentially back to the policy rule prescriptions themselves. The presentation highlights the uses and limitations of each way for informing the FOMC's systematic conduct of monetary policy.

Historical Prescriptions of Policy Rules

The effectiveness of monetary policy is enhanced when it is well understood by the public.[1] In simple models of the economy, good economic performance can be achieved by following a monetary policy rule that fosters public understanding and that incorporates key principles of good monetary policy.[2] One such principle is that monetary policy should respond in a predictable way to changes in economic conditions. A second principle is that monetary policy should be accommodative when inflation is below policymakers' longer-run inflation objective and employment is below its maximum sustainable level; conversely, monetary policy should be restrictive when the opposite holds. A third principle is that, to stabilize inflation, the policy rate should be adjusted over time by more than one-for-one in response to persistent increases or decreases in inflation.

Economists have analyzed many monetary policy rules, including the well-known Taylor (1993) rule. Other rules include the "balanced approach" rule, the "adjusted Taylor (1993)" rule, the "price level" rule, and the "first difference" rule (figure A).[3] These policy rules embody the three key principles of good monetary policy and take into account estimates of how far the economy is from the Federal Reserve's dual-mandate goals of maximum employment and price stability. Four of the five rules include the difference between the rate of unemployment that is sustainable in the longer run and the current unemployment rate (the unemployment rate gap); the first-difference rule includes the change in the unemployment gap rather than its level.[4] In

(continued on next page)

1. For a discussion of how the public's understanding of monetary policy matters for the effectiveness of monetary policy, see Janet L. Yellen (2012), "Revolution and Evolution in Central Bank Communications," speech delivered at the Haas School of Business, University of California at Berkeley, Berkeley, Calif., November 13, https://www.federalreserve.gov/newsevents/speech/yellen20121113a.htm.

2. For a discussion regarding principles for the conduct of monetary policy, see Board of Governors of the Federal Reserve System (2018), "Monetary Policy Principles and Practice," Board of Governors, https://www.federalreserve.gov/monetarypolicy/monetary-policy-principles-and-practice.htm.

3. The Taylor (1993) rule was suggested in John B. Taylor (1993), "Discretion versus Policy Rules in Practice," *Carnegie-Rochester Conference Series on Public Policy*, vol. 39 (December), pp. 195–214. The balanced-approach rule was analyzed in John B. Taylor (1999), "A Historical Analysis of Monetary Policy Rules," in John B. Taylor, ed., *Monetary Policy Rules* (Chicago: University of Chicago Press), pp. 319–41. The adjusted Taylor (1993) rule was studied in David Reifschneider and John C. Williams (2000), "Three Lessons for Monetary Policy in a Low-Inflation Era," *Journal of Money, Credit and Banking*, vol. 32 (November), pp. 936–66. A price-level rule was discussed in Robert E. Hall (1984), "Monetary Strategy with an Elastic Price Standard," in *Price Stability and Public Policy*, proceedings of a symposium sponsored by the Federal Reserve Bank of Kansas City, held in Jackson Hole, Wyo., August 2–3 (Kansas City: Federal Reserve Bank of Kansas City), pp. 137–59, https://www.kansascityfed.org/publicat/sympos/1984/s84.pdf. Finally, the first-difference rule is based on a rule suggested by Athanasios Orphanides (2003), "Historical Monetary Policy Analysis and the Taylor Rule," *Journal of Monetary Economics*, vol. 50 (July), pp. 983–1022. A comprehensive review of policy rules is in John B. Taylor and John C. Williams (2011), "Simple and Robust Rules for Monetary Policy," in Benjamin M. Friedman and Michael Woodford, eds., *Handbook of Monetary Economics*, vol. 3B (Amsterdam: North-Holland), pp. 829–59. The same volume of the *Handbook of Monetary Economics* also discusses approaches other than policy rules for deriving policy rate prescriptions.

4. The Taylor (1993) rule represented slack in resource utilization using an output gap (the difference between the current level of real gross domestic product (GDP) and the level that GDP would be if the economy were operating at maximum employment, measured in percent of the latter. The rules in figure A represent slack in resource utilization using the unemployment gap instead, because that gap better captures the FOMC's statutory goal to promote maximum employment. However, movements in these alternative measures of resource utilization are highly correlated. For more information, see the note below figure A.

Monetary Policy Rules *(continued)*

A. Monetary policy rules

Taylor (1993) rule	$R_t^{T93} = r_t^{LR} + \pi_t + 0.5(\pi_t - \pi^{LR}) + (u_t^{LR} - u_t)$
Balanced-approach rule	$R_t^{BA} = r_t^{LR} + \pi_t + 0.5(\pi_t - \pi^{LR}) + 2(u_t^{LR} - u_t)$
Taylor (1993) rule, adjusted	$R_t^{T93\,adj} = maximum\ \{R_t^{T93} - Z_t, 0\}$
Price-level rule	$R_t^{PL} = maximum\ \{r_t^{LR} + \pi_t + (u_t^{LR} - u_t) + 0.5(PLgap_t), 0\}$
First-difference rule	$R_t^{FD} = R_{t-1} + 0.5(\pi_t - \pi^{LR}) + (u_t^{LR} - u_t) - (u_{t-4}^{LR} - u_{t-4})$

NOTE: R_t^{T93}, R_t^{BA}, R_t^{T93adj}, R_t^{PL}, and R_t^{FD} represent the values of the nominal federal funds rate prescribed by the Taylor (1993), balanced-approach, adjusted Taylor (1993), price-level, and first-difference rules, respectively.

R_t denotes the actual nominal federal funds rate for quarter t, π_t is four-quarter price inflation for quarter t, u_t is the unemployment rate in quarter t, and r_t^{LR} is the level of the neutral real federal funds rate in the longer run that, on average, is expected to be consistent with sustaining maximum employment and inflation at the FOMC's 2 percent longer-run objective, π^{LR}. In addition, u_t^{LR} is the rate of unemployment in the longer run. Z_t is the cumulative sum of past deviations of the federal funds rate from the prescriptions of the Taylor (1993) rule when that rule prescribes setting the federal funds rate below zero. $PLgap_t$ is the percent deviation of the actual level of prices from a price level that rises 2 percent per year from its level in a specified starting period.

The Taylor (1993) rule and other policy rules are generally written in terms of the deviation of real output from its full capacity level. In these equations, the output gap has been replaced with the gap between the rate of unemployment in the longer run and its actual level (using a relationship known as Okun's law) in order to represent the rules in terms of the FOMC's statutory goals. Historically, movements in the output and unemployment gaps have been highly correlated. Box note 3 provides references for the policy rules.

addition, four of the five rules include the difference between recent inflation and the FOMC's longer-run objective (2 percent as measured by the annual change in the price index for personal consumption expenditures (PCE)), while the price-level rule includes the gap between the level of prices today and the level of prices that would have been realized if inflation had been constant at 2 percent from a specified starting year.[5] The price-level rule thereby takes account of the deviation of inflation from the long-run objective in earlier periods as well as the current period, whereas the other rules do not make up past misses of the inflation objective.

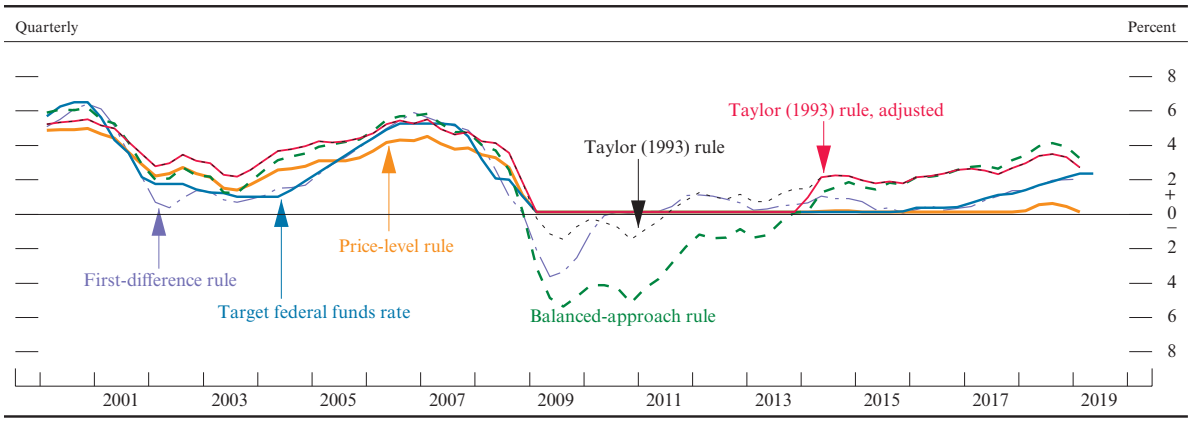
The adjusted Taylor (1993) rule recognizes that the federal funds rate cannot be reduced materially below zero, and that following the prescriptions of the standard Taylor (1993) rule after a recession during which the federal funds rate has fallen to its lower bound may therefore not provide enough policy accommodation. To make up for the cumulative shortfall in accommodation, the adjusted rule prescribes only a gradual return of the policy rate to the (positive) levels prescribed by the standard Taylor (1993) rule after the economy begins to recover. Similarly, the price-level rule specified in figure A recognizes that the federal funds rate cannot be reduced materially below zero. If inflation runs below the 2 percent objective during periods when the price-level rule prescribes setting the federal funds rate well below zero, the rule will, over time, call for more accommodation to make up for the past inflation shortfall.

Policymakers regularly examine the historical prescriptions of different policy rules to help understand the past stance of monetary policy and to inform their current policy decisions. The most straightforward way to compute such prescriptions is to use historical values for the unemployment rate and inflation, as well

(continued)

5. Calculating the prescriptions of the price-level rule requires selecting a starting year for the price level from which to cumulate the 2 percent annual rate of inflation. Figure B uses 1998 as the starting year. Around that time, the underlying trend of inflation and longer-term inflation expectations stabilized at a level consistent with PCE price inflation being close to 2 percent.

B. Historical federal funds rate prescriptions from simple policy rules



NOTE: The rules use historical values of inflation, the federal funds rate, and the unemployment rate. Inflation is measured as the 4-quarter percent change in the price index for personal consumption expenditures (PCE) excluding food and energy. Quarterly projections of long-run values for the federal funds rate and the unemployment rate are derived through interpolations of biannual projections from Blue Chip Economic Indicators. The long-run value for inflation is taken as 2 percent. The target value of the price level is the average level of the price index for PCE excluding food and energy in 1998 extrapolated at 2 percent per year. The target federal funds rate data extend through 2019:Q2.

SOURCE: Federal Reserve Bank of Philadelphia; Wolters Kluwer, Blue Chip Economic Indicators; Federal Reserve Board staff estimates.

as estimates of the longer-run value of the interest rate and the longer-run value of the unemployment rate, in each policy rule.[6] The policy prescriptions from the various rules based on this approach provide different prescriptions for the federal funds rate, as shown in figure B. Presented in this way, each point on the lines in the figure is a snapshot of what the policy rules would have prescribed, given the economic conditions of that time. Because there is no definitive standard for favoring one rule over another, consulting a range of rules is generally preferable to relying on any particular rule. Although almost all of the simple policy rules would have called for values for the federal funds rate that were increasing in recent years, the prescribed values vary widely across rules.

Historical Prescription of the Taylor (1993) Rule with Feedback

One key consideration in evaluating monetary policy rules based solely on historical data is that the policy prescriptions from the rules do not take into account the fact that the economy would have evolved differently if the federal funds rate had followed the alternative paths prescribed by the rules. For example, if the FOMC had followed a policy rule in the past that prescribed higher values for the federal funds rate than actually occurred, the unemployment rate would likely have been higher and inflation lower than they actually turned out to be. In turn, these different outcomes for unemployment and inflation would have fed back into the policy rule, resulting in policy prescriptions that differ from those based on the historical data and shown in figure B. Proper consideration of these feedback effects requires using an economic model, which is a mathematical representation of how economic activity, inflation, the policy interest rate, and other variables interact over time. With such a model, one can assess how inflation and the unemployment rate might have evolved if a particular policy rule had been followed over some historical period in a way that incorporates these feedback effects. Federal Reserve staff regularly use models of the U.S. economy to study how economic outcomes could have differed if monetary policy had followed various rules.

(continued on next page)

6. The Taylor (1993), balanced-approach, adjusted Taylor (1993), and price-level rules all require an estimate of the neutral interest rate in the longer run. In addition, all of the rules use an estimate of the rate of unemployment in the longer run. Both of these objects are determined by structural features in the economy and are not directly observable. The box "Complexities of Monetary Policy Rules" in the July 2018 Monetary Policy Report describes the complications in assessing simple policy rules that arise from uncertainty about the neutral interest rate in the longer run. See Board of Governors of the Federal Reserve System (2018), Monetary Policy Report (Washington: Board of Governors, July), pp. 37–41, https://www.federalreserve.gov/monetarypolicy/files/20180713_mprfullreport.pdf. The current discussion uses estimates of these objects from survey data.

Monetary Policy Rules *(continued)*

Figure C provides one illustrative example of how accounting for feedback effects can alter the prescriptions from a particular rule over a given period. The figure compares the historical prescriptions of the Taylor (1993) rule calculated without feedback—as in the earlier section—with the prescriptions from the same rule incorporating feedback effects. The rule prescriptions with feedback effects result from an empirical simulation of the FRB/US model.[7] The simulation begins in the first quarter of 2001, a period when the prescription of the Taylor (1993) rule without feedback roughly coincides with the historical value of the federal funds rate. The three panels in the figure display the paths for the federal funds rate (top panel), the unemployment rate (middle panel), and four-quarter PCE inflation (bottom panel). The historical data are shown by the black lines. The gray dashed line in the top panel shows the historical prescription of the Taylor (1993) rule without any feedback, the same as the gray dashed line shown in figure B, and the blue dashed-and-dotted line shows the prescriptions with feedback effects. Because monetary policy affects the economy only with a delay, the paths of the unemployment rate and the inflation rate are not much different from their historical values over the first year of the simulation, despite the fact that the Taylor (1993) rule calls for much higher interest rates than actually observed over that period. By 2002, however, the higher rate path under the Taylor (1993) rule causes the economy to slow, resulting in a higher unemployment rate and lower inflation—the blue dashed-and-dotted lines in the middle and bottom panels of figure C, respectively—compared with the historical values. Consequently, the policy rate path in the simulation diverges from the rate path prescribed when feedback effects are not included. Indeed, by the middle of 2003, the value of the federal funds rate is substantially higher in the calculation without feedback effects than it is in the FRB/US model simulation that incorporates feedback from the economy. This difference highlights the limitations in assessing policy rules over history if the prescriptions from the rules are notably different from the historical policy rate path and the effects of the prescriptions of such rules for the economy are not taken into account.

While model simulations can capture the effects of policy rules on the economy and what those economic effects imply for the settings of the policy rate, there are important limitations to such exercises. Each simulation is tied to a particular economic model, and changes in the model can change the prescriptions from the given policy rule. Models are necessarily simplifications of reality, and there is no agreed-upon "best" model representation of the U.S. economy. Indeed, there is substantial diversity among the models favored by economists for this kind of analysis. Finally, in the real world, the structure of the economy changes over time, so an economic model used for studying a historical episode such as the one featured here may not be relevant for future policy considerations.

Model-based simulations with feedback add an important dimension to our understanding of the effects of policy rules. However, it is important to stress that the usefulness of such rules for obtaining and communicating current and future policy rate prescriptions is still limited by a range of practical considerations, even beyond the concerns about which specific model to use. Monetary policy rules feature only a small number of variables and thus exclude many important indicators that are consulted by policymakers. The policy rules here, for example, do not include measures of financial and credit market conditions, indicators of consumer and business sentiment, and data on expectations; these factors are often very informative for the future course of the economy. Moreover, simple policy rules do not take into account possible risks to the economic outlook, which may justify a policy response over and above what would be implied by the most likely outcomes for the economy.[8]

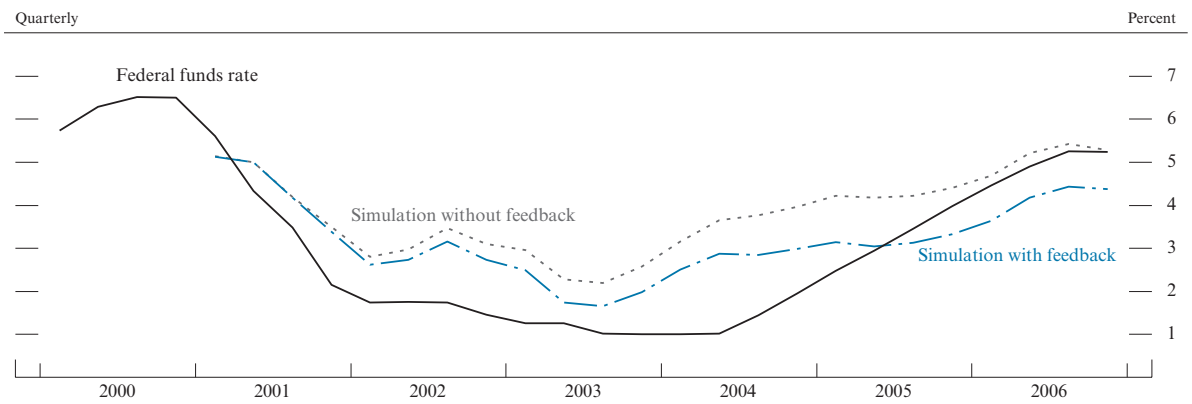
(continued)

7. FRB/US is a large-scale macroeconomic model developed by the Board's staff for forecasting, constructing alternative scenarios, and evaluating monetary policy strategies. The model and related information are available on the Board's website at https://www.federalreserve.gov/econres/us-models-about.htm. An example of the use of FRB/US for monetary policy analysis can be found in Janet L. Yellen (2012), "Perspectives on Monetary Policy," speech delivered at the Boston Economic Club Dinner, Boston, June 6, https://www.federalreserve.gov/newsevents/speech/yellen20120606a.htm.

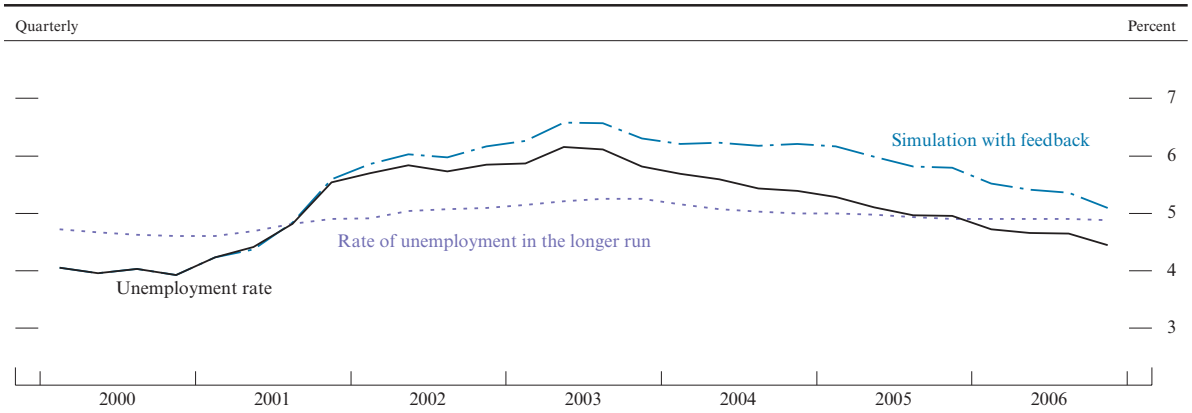
8. The box "Monetary Policy Rules and Their Role in the Federal Reserve's Policy Process" in the February 2018 *Monetary Policy Report* details the limitations of monetary policy rules in accounting for a broad set of risk considerations. See Board of Governors of the Federal Reserve System (2018), *Monetary Policy Report* (Washington: Board of Governors, February), pp. 35–38, https://www.federalreserve.gov/monetarypolicy/files/20180223_mprfullreport.pdf.

C. Simple policy rule simulations—Taylor (1993)

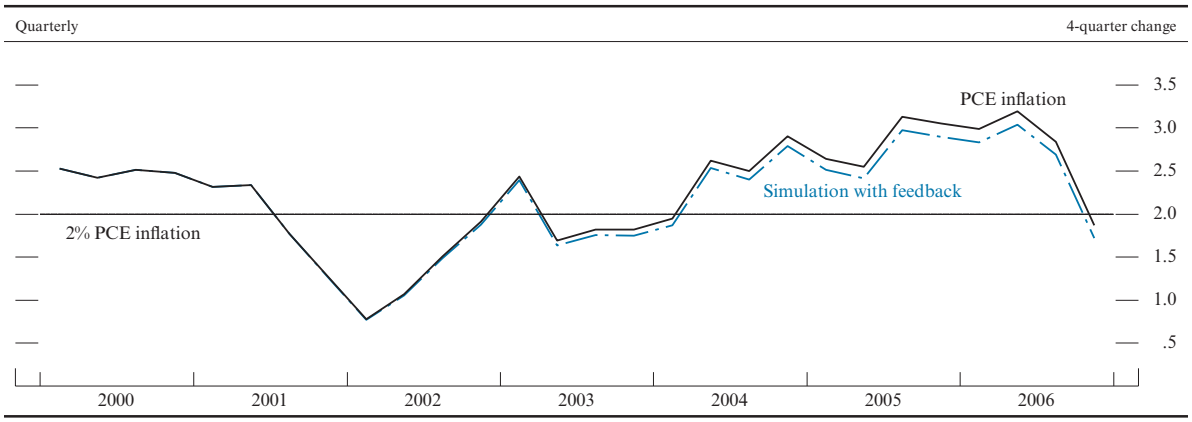
Federal funds rate



Unemployment rate



PCE inflation



NOTE: Data start in 2000:Q1 and extend through 2006:Q4.
SOURCE: Federal Reserve Bank of Philadelphia; Wolters Kluwer, Blue Chip Economic Indicators; Federal Reserve Board staff estimates.

Framework for Monetary Policy Implementation and Normalization of the Federal Reserve's Balance Sheet

At its meetings in January and March of this year, the Federal Open Market Committee (FOMC) made important decisions regarding its framework for monetary policy implementation and the process of normalizing the size of its balance sheet. The issues associated with these decisions have been discussed over several FOMC meetings and have been part of an ongoing process of the Committee's deliberations.[1]

After indicating in previous communications that, in the longer run, the Committee intends to operate in a regime in which it holds no more securities than necessary to implement monetary policy efficiently and effectively, the FOMC decided at its January meeting to continue to implement monetary policy in a regime with an ample supply of reserves.[2] Such a system, which has been in place since late 2008, does not require active management of reserves through frequent open market operations. Instead, with ample reserves in the banking system, the federal funds rate is expected to settle near the rate of interest paid on excess reserves. This system has proven to be an efficient means of controlling the policy rate and effectively transmitting the stance of policy to a wide array of other money market rates and to broader financial conditions. In the statement released after its January meeting, the FOMC also indicated that it continues to view the target range for the federal funds rate as its primary tool to adjust the stance of monetary policy. Nonetheless, the Committee is prepared to adjust the details of its plans for balance sheet normalization in light of economic and financial developments. 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.

Following the March FOMC meeting, the Committee announced that it intends to conclude the reduction of its aggregate securities holdings in the System Open Market Account at the end of September 2019.[3] Consistent with its decision at the March FOMC meeting, the Committee slowed balance sheet runoff in May by reducing the cap for monthly redemptions of Treasury securities from $30 billion to $15 billion (left panel of figure A). In connection with its intention to cease balance sheet runoff entirely at the end of September 2019 and consistent with its aim of holding primarily Treasury securities in the longer run, the Committee also stated that it intends to continue to allow its holdings of agency securities to decline. Therefore, beginning in October 2019, principal payments received from holdings of agency debt and agency mortgage-backed securities (MBS) will be reinvested in Treasury securities through secondary-market purchases subject to a maximum amount of $20 billion per month. Purchases of Treasury securities will initially be conducted across a range of maturities to roughly match the maturity composition of Treasury securities outstanding.[4] Any principal payments from

(continued)

1. For summaries of these discussions, see the minutes from the FOMC meetings in November and December of last year as well as the minutes of this year's January and March meetings, which are available on the Board's website at https://www.federalreserve.gov/monetarypolicy/fomccalendars.htm.

2. See the Statement Regarding Monetary Policy Implementation and Balance Sheet Normalization, which is available on the Board's website at https://www.federalreserve.gov/monetarypolicy/policy-normalization.htm.

3. See the Balance Sheet Normalization Principles and Plans, which can be found on the Board's website at https://www.federalreserve.gov/monetarypolicy/policy-normalization.htm.

4. Details on the reinvestment of principal payments from the Federal Reserve's holdings of agency securities, including information on the distribution of Treasury purchases, are available on the Federal Reserve Bank of New York's website at

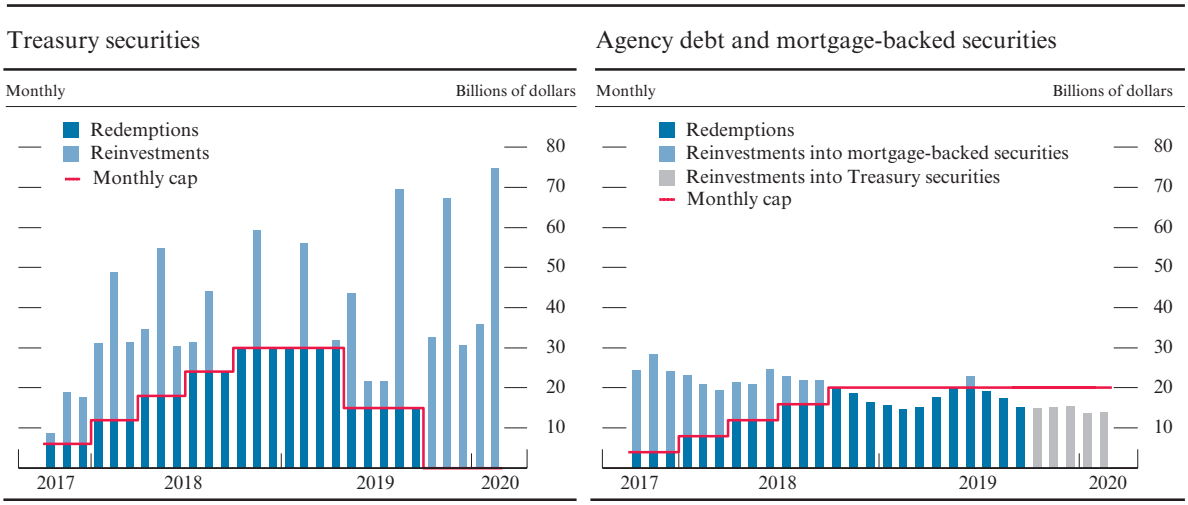
agency securities holdings in excess of the monthly $20 billion maximum will continue to be reinvested into agency MBS (right panel of figure A).

When the process of normalizing the size of the Federal Reserve's balance sheet concludes at the end of September, reserves will likely be somewhat above the level necessary for an efficient and effective implementation of monetary policy. If so, the Committee plans after September to keep the size of the Federal Reserve's securities holdings roughly constant for a while. During this period, reserve balances will continue to decline gradually as currency and other nonreserve liabilities increase. Once the Committee judges that reserve balances have declined to the level consistent with the efficient and effective implementation of monetary policy, the FOMC plans to resume periodic open market operations to accommodate the normal trend growth in the demand for the Federal Reserve's liabilities.[5]

https://www.newyorkfed.org/markets/treasury-reinvestments-purchases-faq.html. The FOMC will revisit the reinvestment plan in connection with its deliberations regarding the longer-run composition of the System Open Market Account portfolio.

5. In contrast to the Federal Reserve's large-scale asset purchases conducted over recent years, these periodic technical open market operations would not have any implication for the stance of monetary policy; rather, such operations would be aimed at maintaining a level of reserve balances in the banking system consistent with efficient and effective policy implementation.

A. Principal payments on SOMA securities



NOTE: Reinvestment and redemption amounts of Treasury securities are projections starting in June 2019. The data extend through February 2020.

SOURCE: Federal Reserve Bank of New York; Federal Reserve Board staff calculations.

NOTE: Reinvestment and redemption amounts of agency debt and mortgage-backed securities are projections starting in June 2019. Starting in October 2019, principal payments from holdings of agency securities below $20 billion per month are reinvested into Treasury securities, while those above are reinvested into agency mortgage-backed securities. The data extend through February 2020.

SOURCE: Federal Reserve Bank of New York; Federal Reserve Board staff calculations.

Part 3
Summary of Economic Projections

In conjunction with the Federal Open Market Committee (FOMC) meeting held on June 18–19, 2019, meeting participants submitted their projections of the most likely outcomes for real gross domestic product (GDP) growth, the unemployment rate, and inflation for each year from 2019 to 2021 and over the longer run. Each participant's projections were based on information available at the time of the meeting, together with his or her assessment of appropriate monetary policy—including a path for the federal funds rate and its longer-run value—and assumptions about other factors likely to affect economic outcomes.[19] 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.[20] "Appropriate monetary policy" is defined as the future path of policy that each participant deems most likely to foster outcomes for economic activity and inflation that best satisfy his or her individual interpretation of the statutory mandate to promote maximum employment and price stability.

Participants who submitted longer-run projections generally expected that, under appropriate monetary policy, growth of real GDP in 2019 would run at or somewhat above their individual estimates of its longer-run rate. Thereafter, almost all participants expected real GDP growth to edge down, with the vast majority of participants projecting growth in 2021 to be at or below their estimates of its longer-run rate. All participants who submitted longer-run projections continued to expect that the unemployment rate would run at or below their estimates of its longer-run level through 2021. Compared with the Summary of Economic Projections (SEP) from March 2019, most participants revised down slightly their projections for the unemployment rate from 2019 through 2021. All participants marked down somewhat their projections for 2019 for total inflation, as measured by the four-quarter percent change in the price index for personal consumption expenditures (PCE), and almost all did so for their projections for core inflation. All participants projected that inflation would increase in 2020 from 2019, and a majority expected another slight increase in 2021. The vast majority of participants expected that inflation would be at or slightly above the Committee's 2 percent objective in 2021. Core PCE price inflation was also projected to increase over the projection period, rising to 2.0 percent in 2021. Table 1 and figure 1 provide summary statistics for the projections.

As shown in figure 2, about half of participants expected that the evolution of the economy, relative to their objectives of maximum employment and 2 percent inflation, would likely warrant keeping the federal funds rate at its current level through the end of 2019; the same number projected that a lower level for the federal funds rate would be appropriate by year-end. The medians of participants' assessments of the appropriate level of the federal funds rate in

19. Five members of the Board of Governors were in office at the time of the June FOMC meeting.

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

Table 1. Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents, under their individual assessments of projected appropriate monetary policy, June 2019

Percent

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

NOTE: Projections of change in real gross domestic product (GDP) and projections for both measures of inflation are percent changes from the fourth quarter of the previous year to the fourth quarter of the year indicated. PCE inflation and core PCE inflation are the percentage rates of change in, respectively, the price index for personal consumption expenditures (PCE) and the price index for PCE excluding food and energy. Projections for the unemployment rate are for the average civilian unemployment rate in the fourth quarter of the year indicated. Each participant's projections are based on his or her assessment of appropriate monetary policy. Longer-run projections represent each participant's assessment of the rate to which each variable would be expected to converge under appropriate monetary policy and in the absence of further shocks to the economy. The projections for the federal funds rate are the value of the midpoint of the projected appropriate target range for the federal funds rate or the projected appropriate target level for the federal funds rate at the end of the specified calendar year or over the longer run. The March projections were made in conjunction with the meeting of the Federal Open Market Committee on March 19–20, 2019. 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 19–20, 2019, meeting, and one participant did not submit such projections in conjunction with the June 18–19, 2019, meeting.

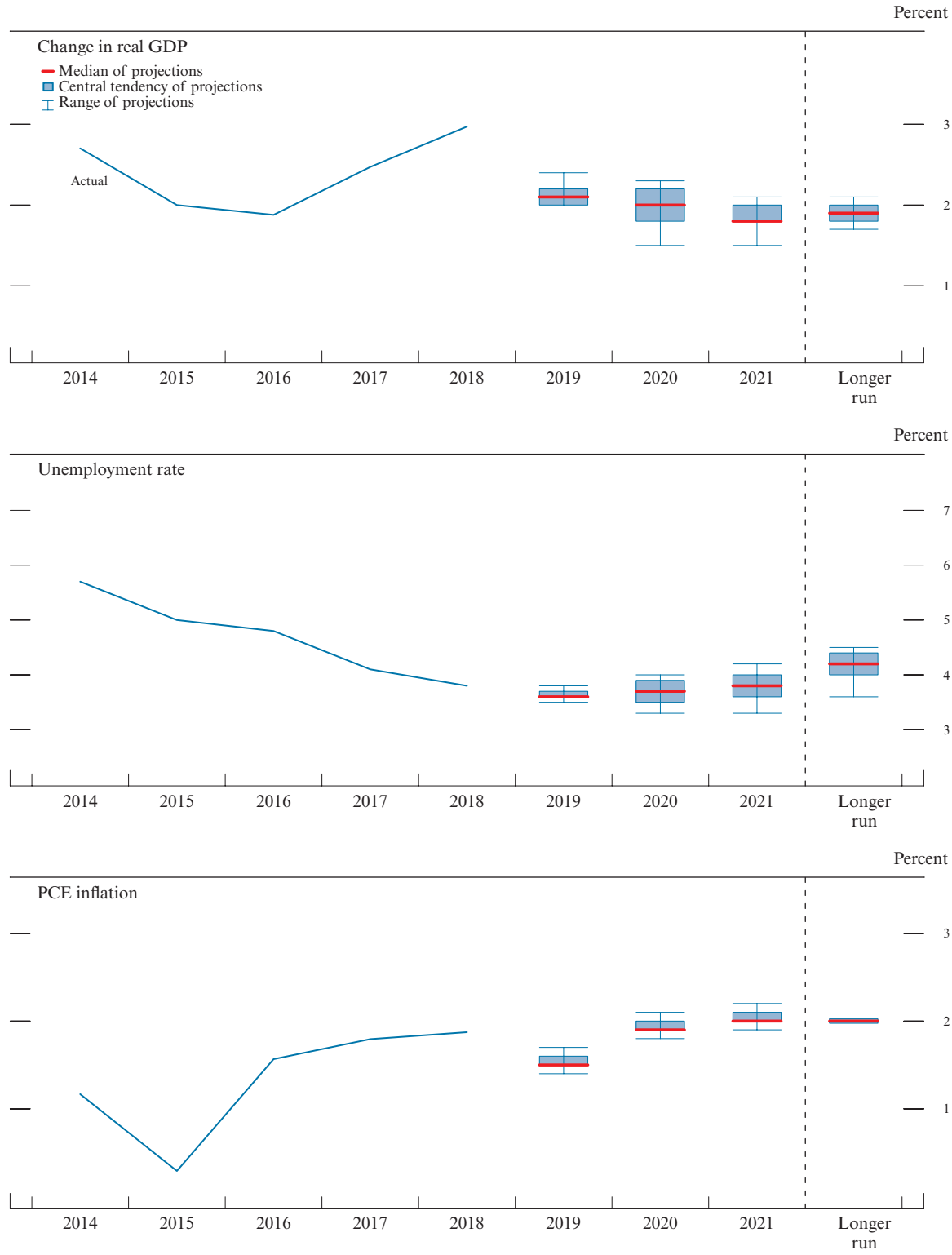
1. For each period, the median is the middle projection when the projections are arranged from lowest to highest. When the number of projections is even, the median is the average of the two middle projections.
2. The central tendency excludes the three highest and three lowest projections for each variable 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.

2020 and 2021 were close to the median of their assessments of the longer-run federal funds rate level. Nearly all participants lowered their projections for the appropriate level of the federal funds rate, relative to March, at some point in the forecast period. Although nearly half of the participants revised their projections for 2019 to levels 25 basis points or 50 basis points below the current level, the median projection for the federal funds rate for the end of 2019 was unchanged. The medians for the federal funds rate for 2020 and 2021 were 50 basis points and 25 basis points lower than in March, respectively.

Most participants regarded the uncertainties around their forecasts for GDP growth, total inflation, and core inflation as broadly similar to the average of the past 20 years. About half of the participants viewed the level of uncertainty around their unemployment rate projections as being similar to the average of the past 20 years, and about the same number viewed uncertainty as higher. Participants' assessments of risks to their outlooks for output growth and the unemployment rate shifted notably relative to their assessments in March. As a result, most participants viewed the risks for GDP growth as weighted to the downside and the risks for the unemployment rate as weighted to the upside. About half of participants viewed the risks to inflation as being broadly balanced, with a similar number viewing inflation risks as being weighted to the downside.

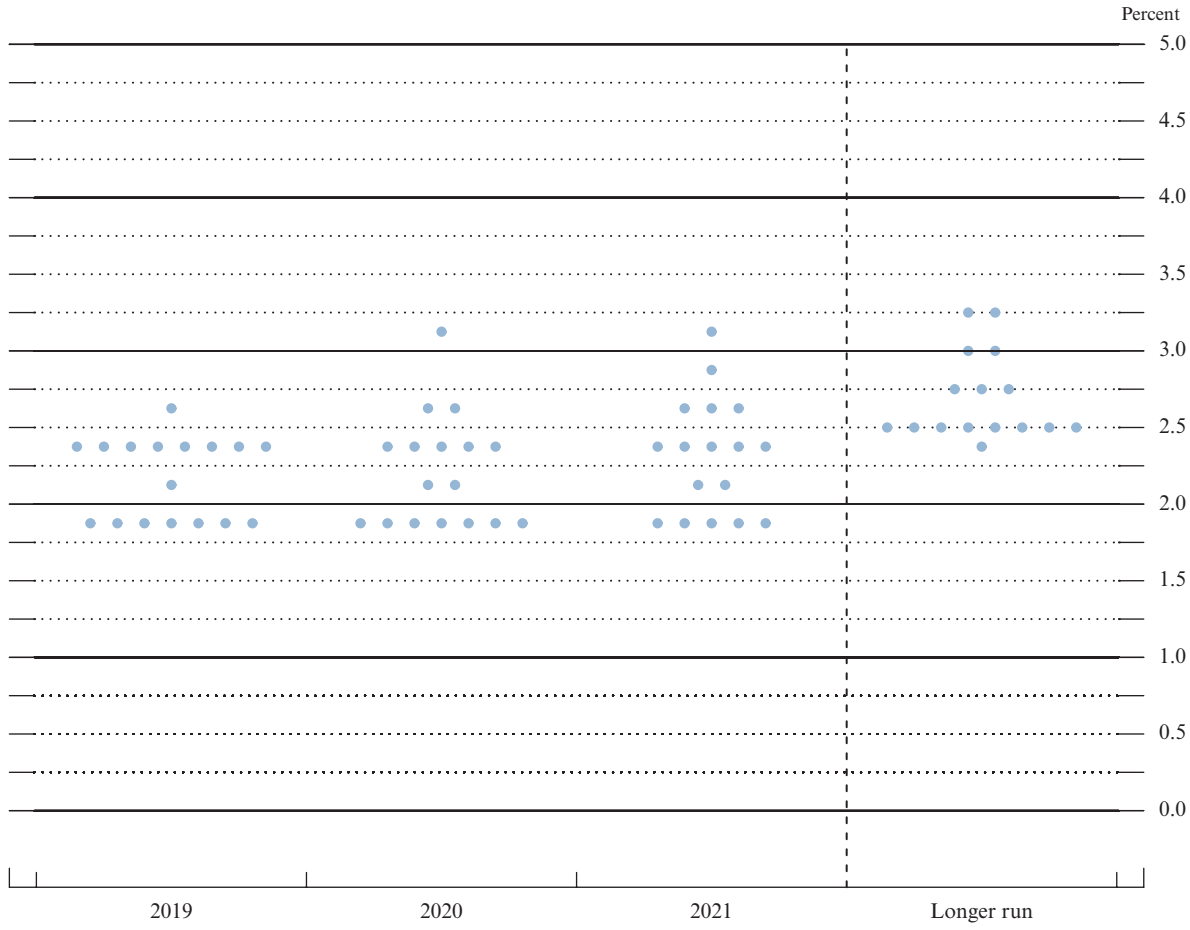
A more complete description of the SEP will be released with the minutes of the June 18–19, 2019, FOMC meeting on July 10.

Figure 1. Medians, central tendencies, and ranges of economic projections, 2019–21 and over the longer run



NOTE: Definitions of variables and other explanations are in the notes to the projections table. 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 ⅛ 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.

Abbreviations

AFE	advanced foreign economy
CCyB	countercyclical capital buffer
DPI	disposable personal income
ECB	European Central Bank
EME	emerging market economy
EPOP	employment-to-population ratio
FOMC	Federal Open Market Committee; also, the Committee
FRB/US	a large-scale macroeconometric model of the U.S. economy
GDP	gross domestic product
IP	industrial production
JOLTS	Job Openings and Labor Turnover Survey
LFPR	labor force participation rate
MBS	mortgage-backed securities
OPEC	Organization of the Petroleum Exporting Countries
PCE	personal consumption expenditures
SEC	U.S. Securities and Exchange Commission
SLOOS	Senior Loan Officer Opinion Survey on Bank Lending Practices
TIPS	Treasury Inflation-Protected Securities
VIX	implied volatility for the S&P 500 index