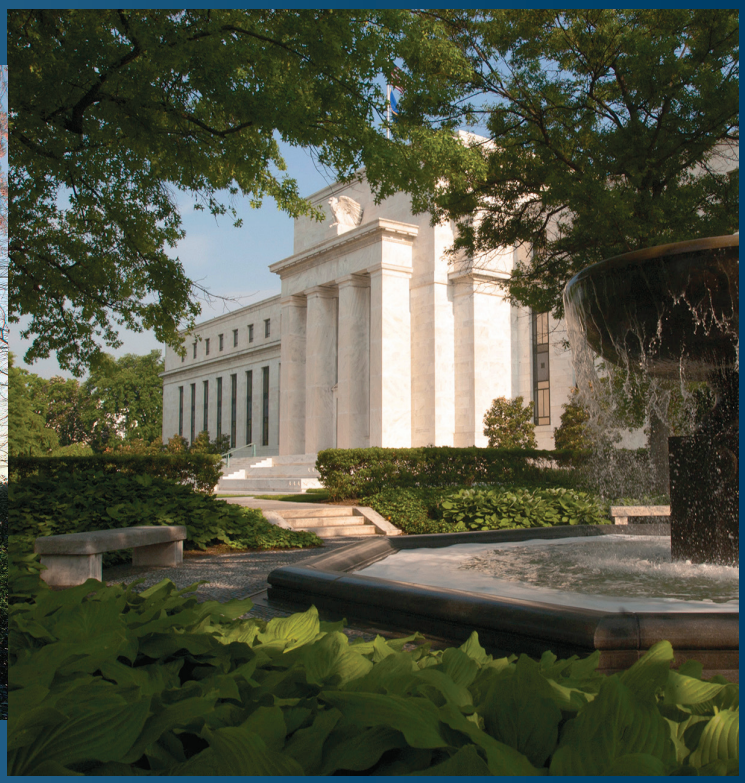
For use at 11:00 a.m. EDT
July 9, 2021

Monetary Policy Report

July 9, 2021



Board of Governors of the Federal Reserve System

Letter of Transmittal

Board of Governors of the
Federal Reserve System

Washington, D.C., July 9, 2021

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

Jerome H. Powell, Chair

Statement on Longer-Run Goals and Monetary Policy Strategy

Adopted effective January 24, 2012; as amended effective January 26, 2021

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.

Employment, inflation, and long-term interest rates fluctuate over time in response to economic and financial disturbances. Monetary policy plays an important role in stabilizing the economy in response to these disturbances. The Committee's primary means of adjusting the stance of monetary policy is through changes in the target range for the federal funds rate. The Committee judges that the level of the federal funds rate consistent with maximum employment and price stability over the longer run has declined relative to its historical average. Therefore, the federal funds rate is likely to be constrained by its effective lower bound more frequently than in the past. Owing in part to the proximity of interest rates to the effective lower bound, the Committee judges that downward risks to employment and inflation have increased. The Committee is prepared to use its full range of tools to achieve its maximum employment and price stability goals.

The maximum level of employment is a broad-based and inclusive goal that is not directly measurable and changes over time owing largely to nonmonetary factors that affect the structure and dynamics of the labor market. 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 shortfalls of employment from its maximum level, recognizing that such assessments are necessarily uncertain and subject to revision. The Committee considers a wide range of indicators in making these assessments.

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 judges that longer-term inflation expectations that are well anchored at 2 percent foster price stability and moderate long-term interest rates and enhance the Committee's ability to promote maximum employment in the face of significant economic disturbances. In order to anchor longer-term inflation expectations at this level, the Committee seeks to achieve inflation that averages 2 percent over time, and therefore judges that, following periods when inflation has been running persistently below 2 percent, appropriate monetary policy will likely aim to achieve inflation moderately above 2 percent for some time.

Monetary policy actions tend to influence economic activity, employment, and prices with a lag. In setting monetary policy, the Committee seeks over time to mitigate shortfalls of employment from the Committee's assessment of its maximum level and deviations of inflation from its longer-run goal. Moreover, sustainably achieving maximum employment and price stability depends on a stable financial system. 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 Committee's employment and inflation objectives are generally complementary. However, under circumstances in which the Committee judges that the objectives are not complementary, it takes into account the employment shortfalls and inflation 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 review these principles and to make adjustments as appropriate at its annual organizational meeting each January, and to undertake roughly every 5 years a thorough public review of its monetary policy strategy, tools, and communication practices.

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Note: This report reflects information that was publicly available as of noon EDT on July 7, 2021. Unless otherwise stated, the time series in the figures extend through, for daily data, July 6, 2021; for monthly data, May 2021; and, for quarterly data, 2021: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.

For figure B, "Federal Reserve liabilities," and figure C, "Balance sheet comparison," on pages 46 and 47, on July 14, 2021, the "Federal Reserve notes" and "Other liabilities and capital" data were corrected to place Federal Reserve bank holdings of Federal Reserve notes in the latter category.

Summary

Over the first half of 2021, progress on vaccinations has led to a reopening of the economy and strong economic growth, supported by accommodative monetary and fiscal policy. However, the effects of the COVID-19 pandemic have continued to weigh on the U.S. economy, and employment has remained well below pre-pandemic levels. Furthermore, shortages of material inputs and difficulties in hiring have held down activity in a number of industries. In part because of these bottlenecks and other largely transitory factors, PCE (personal consumption expenditures) prices rose 3.9 percent over the 12 months ending in May.

Over the first half of the year, the Federal Open Market Committee (FOMC) held its policy rate near zero and continued to purchase Treasury securities and agency mortgage-backed securities to support the economic recovery. These measures, along with the Committee's guidance on interest rates and the Federal Reserve's balance sheet, will help ensure that monetary policy continues to deliver powerful support to the economy until the recovery is complete.

Recent Economic and Financial Developments

The labor market. The labor market continued to recover over the first six months of 2021. Job gains averaged 540,000 per month, and the unemployment rate moved down from 6.7 percent in December to 5.9 percent in June. Although labor market improvement has been rapid, the unemployment rate remained elevated in June, and labor force participation has not moved up from the low rates that have prevailed for much of the past year. A surge in labor demand that has outpaced the recovery in labor supply has resulted in a jump in job vacancies and a step-up in wage gains in recent months.

Inflation. Consumer price inflation, as measured by the 12-month change in the PCE price index, moved up from 1.2 percent at the end of last year to 3.9 percent in May. The 12-month measure of inflation that excludes food and energy items (so-called core inflation) was 3.4 percent in May, up from 1.4 percent at the end of last year. Some of the strength in recent 12-month inflation readings reflects the comparison of current prices with prices that sank at the onset of the pandemic as households curtailed spending—a transitory result of "base effects." More lasting but likely still temporary upward pressure on inflation has come from prices for goods experiencing supply chain bottlenecks, such as motor vehicles and appliances. In addition, prices for some services, such as airfares and lodging, have moved up sharply in recent months toward more normal levels as demand has recovered. Both survey-based and market-based measures of longer-term inflation expectations have risen since the end of last year, largely reversing the downward drift in those measures in recent years, and are in a range that is broadly consistent with the FOMC's longer-run inflation objective.

Economic activity. In the first quarter, real gross domestic product (GDP) increased 6.4 percent, propelled by a surge in household consumption and a solid increase in business investment but restrained by a substantial drawdown in inventories as firms contended with production bottlenecks. Data for the second quarter suggest a further robust increase in demand. Against a backdrop of elevated household savings, accommodative financial conditions, ongoing fiscal support, and the reopening of the economy, the strength in household spending has persisted, reflecting continued strong spending on durable goods and solid progress toward more normal levels of spending on services.

Financial conditions. Since mid-February, equity prices and yields on nominal Treasury securities at longer maturities increased, as the rapid deployment of highly effective COVID-19 vaccines in the United States and the support provided by fiscal policy boosted optimism regarding the economic outlook. Despite having increased since February, mortgage rates for households remain near historical lows. Overall financing conditions for businesses and households eased further since February, as market-based lending conditions remained accommodative and bank-lending conditions eased markedly. Large firms, as well as those households that have solid credit ratings, continued to experience ample access to financing. However, financing conditions remained tight for small businesses and households with low credit scores.

Financial stability. While some financial vulnerabilities have increased since the previous *Monetary Policy Report,* the institutions at the core of the financial system remain resilient. Asset valuations have generally risen across risky asset classes with improving fundamentals as well as increased investor risk appetite, including in equity and corporate bond markets. Vulnerabilities from both business and household debt have continued to decline in the first quarter of 2021, reflecting a slower pace of business borrowing, an improvement in business earnings, and government programs that have supported business and household incomes. Even so, business-sector debt outstanding remains high relative to income, and some businesses and households are still under considerable strain. In the financial sector, leverage at banks and broker-dealers remains low, while available measures of leverage at hedge funds increased into early 2021 and are high. Issuance volumes of collateralized loan obligations and asset-backed securities recovered strongly through the first quarter of 2021, while issuance of non-agency commercial mortgage-backed securities was weak in that quarter. Funding risks at domestic banks continued to be low in the first quarter, but structural vulnerabilities persist at some types of money market funds and bank-loan and bond mutual funds. (See the box "Developments Related to Financial Stability" in Part 1.)

International developments. Foreign GDP growth moderated at the start of the year, as some countries tightened public health restrictions to contain renewed COVID-19 outbreaks. Compared with last spring, many foreign economies exhibited greater resilience to public-health-related restrictions, and their governments have continued to provide fiscal support. Recent indicators suggest a pickup in activity in advanced foreign economies this spring following an increase in vaccination rates and an easing of restrictions. However, conditions in emerging market economies are more mixed, in part dependent on their success in containing outbreaks and the availability of vaccines. Inflation has been rising in many economies, as the price declines seen last spring reversed and commodity prices ramped up. Monetary and fiscal policies continue to be supportive, but some foreign central banks are adopting or signaling less-accommodative policy stances.

Foreign financial conditions generally improved or held steady. Equity prices and longer-term sovereign yields increased across advanced foreign economies, boosted by their ongoing reopening. Equity markets in emerging market economies were mixed, and flows into dedicated emerging market funds slowed. After trending lower since the spring of 2020, the foreign exchange value of the dollar has changed little on net since the start of the year.

Monetary Policy

Interest rate policy. To continue to support the economic recovery, the FOMC has kept the target range for the federal funds rate near zero and has maintained the monthly pace of its asset purchases. The Committee expects it will be appropriate to maintain the current

target range for the federal funds rate until labor market conditions have reached levels consistent with its assessments of maximum employment and inflation has risen to 2 percent and is on track to moderately exceed that rate for some time.

Balance sheet policy. With the federal funds rate near zero, the Federal Reserve has also continued to undertake asset purchases, increasing its holdings of Treasury securities by $80 billion per month and its holdings of agency mortgage-backed securities by $40 billion per month. These purchases help foster smooth market functioning and accommodative financial conditions, thereby supporting the flow of credit to households and businesses. The Committee expects these purchases to continue at least at this pace until substantial further progress has been made toward its maximum-employment and price-stability goals. In coming meetings, the Committee will continue to assess the economy's progress toward these goals since the Committee adopted its asset purchase guidance last December.

In assessing the appropriate stance of monetary policy, the Committee will continue to monitor the implications of incoming information for the economic outlook. The Committee is prepared to adjust the stance of monetary policy as appropriate if risks emerge that could impede the attainment of the Committee's goals.

Special Topics

The uneven recovery in labor force participation. The labor force participation rate (LFPR) has improved very little since early in the recovery and remains well below pre-pandemic levels. Relative to its February 2020 level, the LFPR remains especially low for individuals without a college education, for individuals aged 55 and older, and for Hispanics and Latinos. Factors likely contributing both to the incomplete recovery of the LFPR and to differences across groups include a surge in retirements, increased caregiving responsibilities, and individuals' fear of contracting COVID-19; expansions to the availability, duration, and level of unemployment insurance benefits may also have supported individuals who withdrew from the labor force. Many of these factors should have a diminishing effect on participation in the coming months as public health conditions continue to improve and as expanded unemployment insurance expires. (See the box "The Uneven Recovery in Labor Force Participation" in Part 1.)

Recent inflation developments. Consumer price inflation has increased notably this spring as a surge in demand has run up against production bottlenecks and hiring difficulties. As these extraordinary circumstances pass, supply and demand should move closer to balance, and inflation is widely expected to move down. (See the box "Recent Inflation Developments" in Part 1.)

Supply chain bottlenecks in U.S. manufacturing and trade. Supply chain bottlenecks have hampered U.S. manufacturers' ability to procure the inputs needed to meet the surge in demand that followed widespread factory shutdowns during the first half of last year. Additionally, a massive influx of goods has exceeded the capacity of U.S. ports, extending manufacturers' wait times for imported parts. The stress on supply chains is reflected in historically high order backlogs and historically low customer inventories; these stresses, together with strong demand, have led to increased price pressures. When these bottlenecks will resolve is uncertain, as they reflect the global supply chain as well as industry-specific factors, but for some goods, such as lumber, the previous sharp increases in prices have begun to reverse. (See the box "Supply Chain Bottlenecks in U.S. Manufacturing and Trade" in Part 1.)

Inflation expectations. To avoid sustained periods of unusually low or high inflation, a fundamental aspect of the FOMC's monetary

policy framework is for longer-term inflation expectations to be well anchored at the Committee's 2 percent longer-run inflation objective. Even though the pace of price increases has jumped in the first half of this year, recent readings on various measures of inflation expectations indicate that inflation is expected to return to levels broadly consistent with the FOMC's 2 percent longer-run inflation objective after a period of temporarily higher inflation. That said, upside risks to the inflation outlook in the near term have increased. (See the box "Assessing the Recent Rise in Inflation Expectations" in Part 1.)

Monetary policy rules. Simple monetary policy rules, which relate a policy interest rate to a small number of other economic variables, can provide useful guidance to policymakers. Many of the rules have prescribed strongly negative values of the federal funds rate since the start of the pandemic-driven recession. Because of the effective lower bound for the federal funds rate, the Federal Reserve's other monetary policy tools—namely, forward guidance and asset purchases—have been critical for providing the necessary support to the economy through this challenging period. (See the box "Monetary Policy Rules, the Effective Lower Bound, and the Economic Recovery" in Part 2.)

The Federal Reserve's balance sheet. Since January, the growth in reserves, the drawdown of the Treasury General Account, and the surge in usage of the overnight reverse repurchase agreement (ON RRP) facility have significantly affected the composition of the Federal Reserve's liabilities. Against a backdrop of low short-term market interest rates and ample liquidity, the use of the ON RRP facility has increased substantially since April and has reached a recent high of nearly $1 trillion, compared with usage near zero in February. Factors contributing to this increase included the decline in Treasury bill supply, downward pressure on money market rates, and the recent technical adjustment to the Federal Reserve's administered rates. (See the box "Developments in the Federal Reserve's Balance Sheet and Money Markets" in Part 2.)

Part 1
Recent Economic and Financial Developments

Domestic Developments

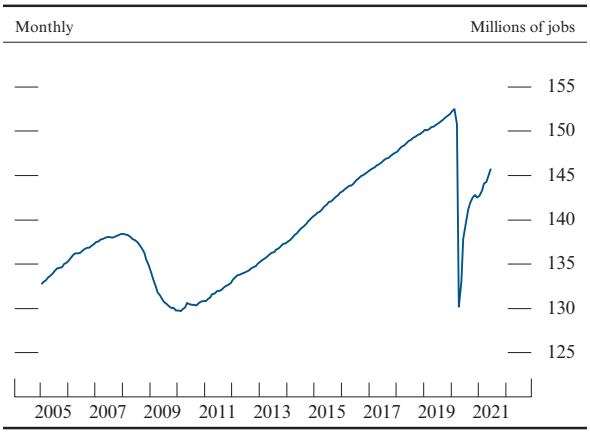
The labor market improved substantially in the first half of the year as the economy reopened and activity rebounded

Payroll employment increased by 3.2 million jobs in the first half of 2021, driven by a 1.6 million job gain in the leisure and hospitality sector, where the largest employment losses occurred last year. Despite the substantial improvement in the labor market, employment remained well below its pre-pandemic level (figure 1). In addition, although the unemployment rate declined 0.8 percentage point in the first half of the year, to 5.9 percent in June, it remained well above its pre-pandemic level (figure 2). This figure understates the shortfall in employment, particularly as factors related to the pandemic appear to be weighing on participation in the labor market.

A brisk increase in labor demand outpaced the return of labor supply . . .

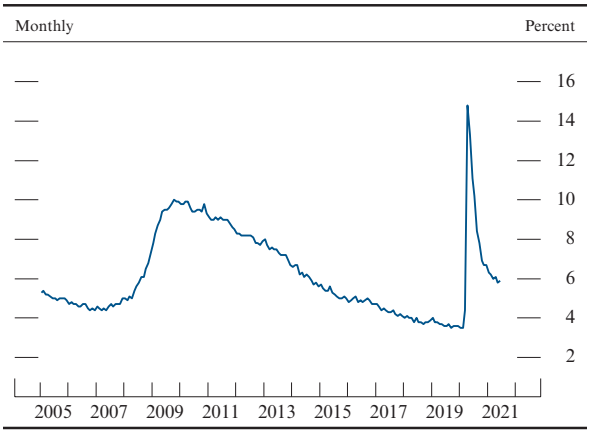
With economic activity rebounding, labor demand rose briskly in the spring, while the supply of labor struggled to keep up. Employers reported widespread hiring difficulties, job openings jumped to about 30 percent above the average level for 2019, and the ratio of job openings to job seekers surged (figure 3). With a dwindling pool of temporarily laid-off workers to recall, hiring increasingly involved reallocation of workers across firms and industries, a more time-consuming process. In addition, enhanced unemployment benefits have allowed potential workers to be more selective and reduce the intensity of their job search. Faced with a challenging environment for hiring, many employers raised wages to attract new workers and lengthened the workweeks of existing employees.

1. Nonfarm payroll employment



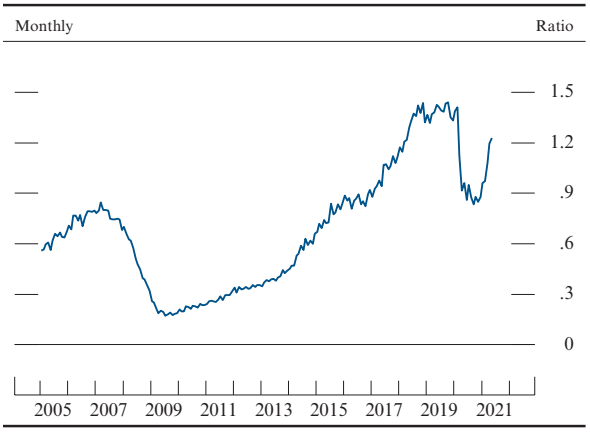
Note: The data extend through June 2021.
Source: Bureau of Labor Statistics via Haver Analytics.

2. Civilian unemployment rate



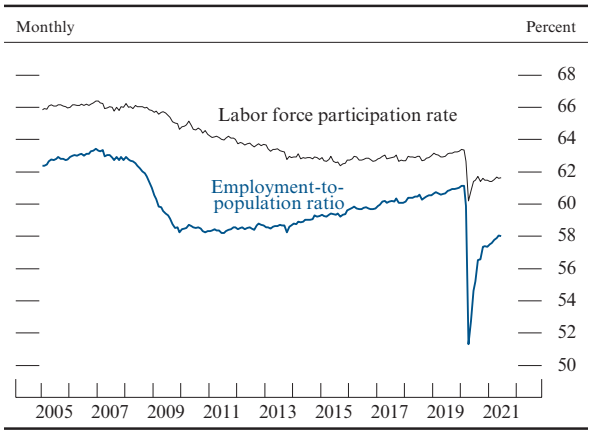
Note: The data extend through June 2021.
Source: Bureau of Labor Statistics via Haver Analytics.

3. Ratio of job openings to job seekers



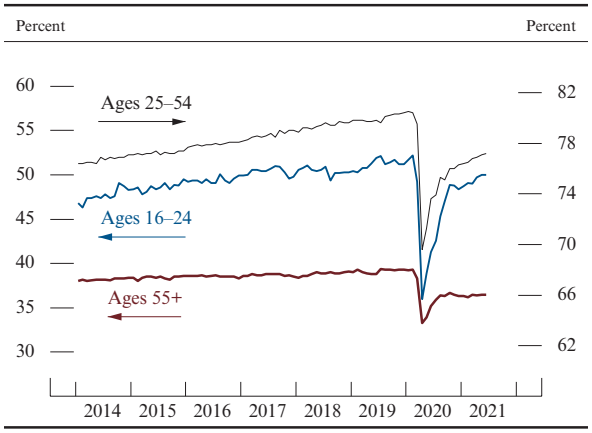
Note: The data are the ratio of job openings to unemployed excluding temporary layoffs.
Source: Bureau of Labor Statistics, Job Openings and Labor Turnover Survey.

4. Labor force participation rate and employment-to-population ratio



NOTE: The labor force participation rate and the employment-to-population ratio are percentages of the population aged 16 and over and extend through June 2021.
SOURCE: Bureau of Labor Statistics via Haver Analytics.

5. Employment-to-population ratio, by age



NOTE: The data are monthly, extend through June 2021, and are seasonally adjusted.
SOURCE: Bureau of Labor Statistics via Haver Analytics.

. . . which was restrained by ongoing effects of the pandemic . . .

Several pandemic-related factors continued to weigh on labor supply in the spring. The share of working-age adults either employed or actively seeking work—the labor force participation rate—has remained low after falling dramatically with the onset of the pandemic and stood at 61.6 percent in June (figure 4). With less than half of the population fully vaccinated for COVID-19 and inoculation rates far lower in some places, safety in the workplace remained a salient issue for many potential workers, and caregiving demands were still elevated for many households. Furthermore, a surge in retirements both last year and this year, possibly in response to health-related concerns or job loss induced by the pandemic, reduced the pool of potential hires for employers (figure 5).

. . . and much slack remains in the labor market . . .

Although the unemployment rate has moved down sharply from its pandemic high, broad measures of labor conditions continue to point to substantial slack in the labor market. The employment-to-population ratio, which encompasses both unemployment and labor force participation, remains well below the trend observed in recent years, at 58.0 percent in June. Adjusted to include workers who have exited the labor force since the start of the pandemic and workers on temporary layoff misclassified as nonparticipants, the unemployment rate was about 8.7 percent in June.[1]

1. Since the beginning of the pandemic, some people on temporary layoff, who should be counted as unemployed, have instead been recorded as "employed but not at work." Had these workers been correctly classified, the Bureau of Labor Statistics estimates that the unemployment rate in June would have been as much as 0.2 percentage point above the reported rate.

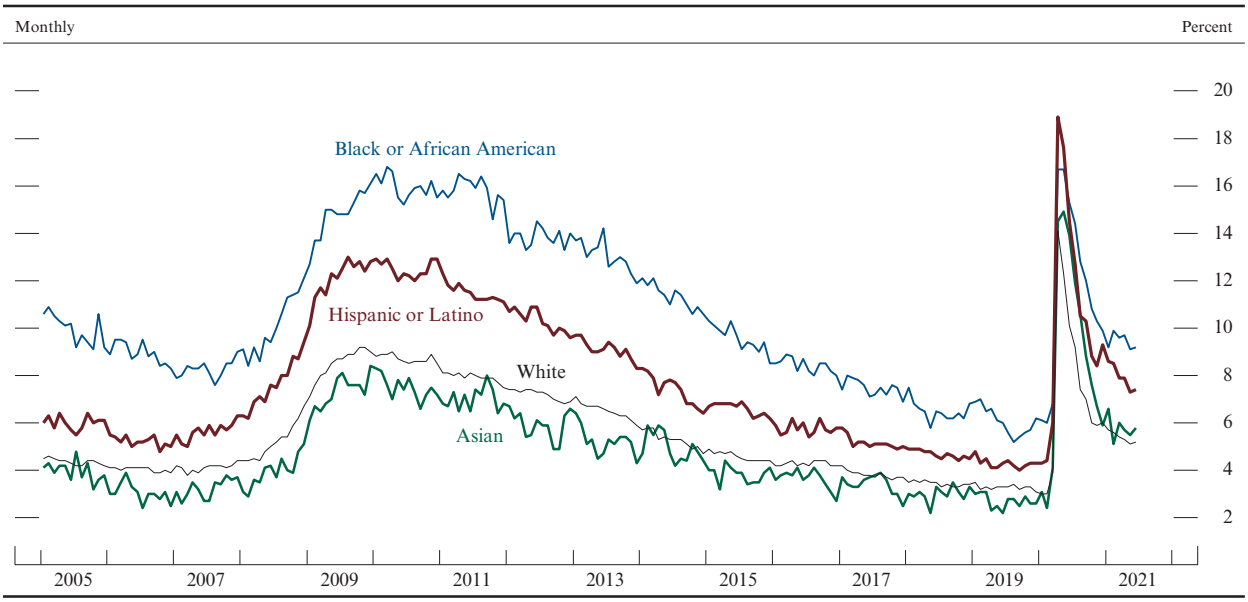
. . . especially for some groups that have been particularly hard hit by the crisis

Further progress has been made since the turn of the year in reversing the pandemic-induced spike in unemployment for all racial and ethnic groups (figure 6). That said, improvement in the labor market has been uneven. The effect of the pandemic on employment was largest for workers with lower wages, for workers with lower educational attainment, and for African Americans and Hispanics, and these hard-hit groups still have the most ground left to regain. And the pandemic seems to have taken a particularly large toll on the labor force participation of mothers, especially Hispanic mothers. (See the box "The Uneven Recovery in Labor Force Participation.")

Wages have risen sharply as the economy has reopened . . .

Amid the transition to a more normal pace of economic activity, labor market pressures have led to a step-up in wage gains so far this year. Total hourly compensation as measured by the employment cost index rose at an annual rate of 4.0 percent over the first three months

6. Unemployment rate, by race and ethnicity



NOTE: The data extend through June 2021. 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. Small sample sizes preclude reliable estimates for Native Americans and other groups for which monthly data are not reported by the Bureau of Labor Statistics.

SOURCE: Bureau of Labor Statistics via Haver Analytics.

The Uneven Recovery in Labor Force Participation

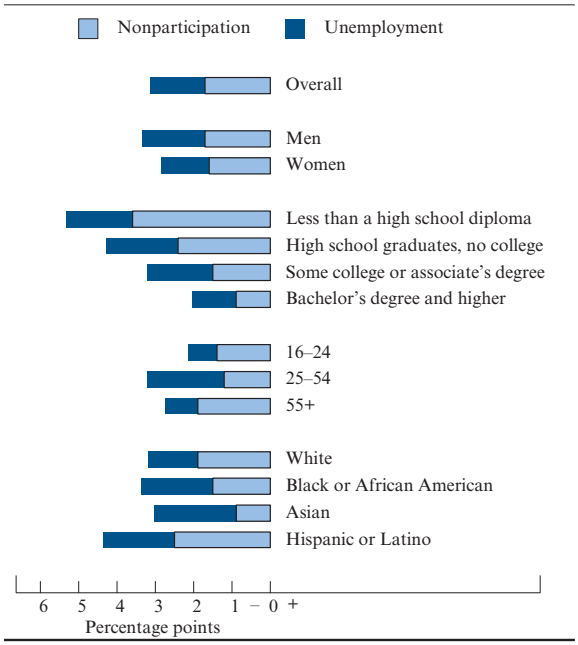
By many measures, the labor market has only partially recovered from the depths of the pandemic-driven recession. This discussion presents comparisons of recent readings on labor market conditions to those just before the pandemic. However, the reactions of businesses and workers to the pandemic may have long-lasting effects on the structure of the labor market. For example, the pandemic seems to have accelerated the adoption of new technologies by firms and the pace of retirements by workers. The post-pandemic labor market and the characteristics of maximum employment may well be different from those of early 2020.

As shown in the top bar of figure A, in June the percentage of the population aged 16 and older that is employed—or the employment-to-population (EPOP) ratio—was about 3 percentage points below its pre-pandemic (February 2020) level. This figure decomposes the decline in the EPOP ratio into the amount attributable to a decline in the percentage of the population working or actively looking for work, or the labor force participation rate (LFPR, light-blue bar), and an increase in unemployment (dark-blue bar).[1] About one-half of the decline in the EPOP ratio since February 2020 reflects a decline in the LFPR, which in June was 1¾ percentage points below its pre-pandemic level, while the rest is due to elevated unemployment.

Differences in these measures across various demographic groups existed even before the recession, and they widened after the start of the pandemic. While they have generally narrowed somewhat over the past year, the figure illustrates that differences across groups relative to pre-pandemic levels remain significant: EPOP ratios are more depressed for those without a college education relative to the college educated and for Hispanics relative to others, with much of these differences reflecting larger declines in the LFPRs of these groups.[2] The EPOP ratio is depressed more for those aged 25 to 54 relative to other ages, while the LFPR has fallen by more for those aged 55 or older.

While the unemployment rate has moved down gradually but steadily since peaking in April 2020, improvements in the LFPR have been less consistent, and since August 2020, the LFPR has fluctuated in a narrow, low range despite broader improvement in labor market conditions. The LFPRs for most of the groups shown in figure A also remain well below pre-pandemic levels. The rest of this discussion covers three reasons why the recovery in the LFPR remains incomplete, and that also may help explain why the recovery has been weaker for some groups than others—namely, a surge in retirements, heightened caregiving responsibilities, and individuals' fears of contracting COVID-19. In addition, expansions to the availability, amount, and duration of unemployment insurance (UI) benefits have given many individuals the financial means to be more selective when finding a new job, especially if pandemic- or individual-specific factors have limited their ability to quickly reenter the labor force.

A. Change in employment-to-population ratio, by demographic group



NOTE: The data are seasonally adjusted and extend from February 2020 to June 2021. Small sample sizes preclude reliable estimates for Native Americans and other groups for which monthly data are not reported by the Bureau of Labor Statistics.
SOURCE: Bureau of Labor Statistics via Haver Analytics.

Retirements: Even in the absence of the pandemic, the aging of the baby boomer cohort would likely have implied an increase in the share of the population that is retired relative to pre-pandemic levels of around 0.3 percentage point.[3] However, the share of the population in the Current Population Survey (CPS) that

(continued)

1. The unemployment series in figure A shows changes in the number of unemployed workers as a percentage of the civilian population aged 16 or older. This measure differs from the unemployment rate, which is the number of unemployed individuals as a percentage of the civilian labor force.

2. For further discussion of factors contributing to these differences, see the box "Disparities in Job Loss during the Pandemic" in Board of Governors of the Federal Reserve System (2021), *Monetary Policy Report* (Washington: Board of Governors, February), pp. 12–14, https://www.federalreserve.gov/monetarypolicy/files/20210219_mprfullreport.pdf.

3. For estimates of the effect of population aging on the LFPR in the decade before the start of the pandemic, see, for example, Joshua Montes (2018), "CBO's Projection of Labor Force Participation Rates," Working Paper 2018-04

B. Percent of the population not in the labor force and retired, change from January and February 2020 to April and May 2021

Group	Not in the labor force	Not in the labor force and retired
All individuals aged 16 and older	1.7	1.0
Aged 55 and older	1.7	1.9
Men	1.9	1.8
Women	1.5	2.0
White	1.8	1.8
Black or African American	.9	1.8
Asian	3.8	4.2
Hispanic or Latino	2.5	2.9

NOTE: Federal Reserve Board staff estimates from microdata in the Current Population Survey (CPS). Estimates are not seasonally adjusted. Small sample sizes preclude reliable estimates for Native Americans and other groups not included in the table.
SOURCE: Census Bureau, CPS.

C. Percent of the population not in the labor force and caregiving, change from January and February 2020 to April and May 2021

Group	Not in the labor force	Not in the labor force and caregiving
All individuals aged 16 and older	1.7	.7
Women aged 25 to 54 without children	1.8	1.0
Mothers aged 25 to 54 with only children aged 5 and younger	1.4	1.4
Mothers aged 25 to 54 with children aged 6 to 17	2.6	2.6
White	2.7	2.5
Black or African American	2.8	3.6
Asian	2.3	1.3
Hispanic or Latino	5.0	4.0
Fathers aged 25 to 54 with children aged 6 to 17	.7	.6

NOTE: Federal Reserve Board staff estimates from microdata in the Current Population Survey (CPS). Estimates are not seasonally adjusted. Individuals not in the labor force and caregiving are those who are not in the labor force and report "taking care of house or family" as their current situation. Small sample sizes preclude reliable estimates for Native Americans and other groups not included in the table.
SOURCE: Census Bureau, CPS.

indicates being out of the labor force and retired jumped at the start of the pandemic and, as shown in figure B, has increased by 1 percentage point since early 2020—accounting for more than one-half of the 1.7 percentage point decline in the aggregate LFPR over this period.[4] Among individuals aged 55 and older, the increase has been larger for women than for men and larger for Hispanics and Asians than for whites and Blacks.

Caregiving responsibilities: Figure C shows that nonparticipation in the labor force associated with caregiving has increased 0.7 percentage point.[5] This increase likely reflects in part the difficulties imposed on parents and other caregivers from in-person education not being fully available to many K–12 students, and some of these parents may have decided to stop working or looking for work to help care for their children and facilitate their virtual education.[6]

Consistent with a considerable effect from students' virtual education, estimates from the figure also show that the increase in nonparticipation for caregiving reasons has been larger for mothers aged 25 to 54 with children aged 6 to 17 (2.6 percentage points) than for women without their own children in the home (1.0 percentage point), women who only have children aged 5 and younger (1.4 percentage points), and fathers (0.6 percentage point) and accounts for all of the decline in the LFPR for mothers.[7] The increase in nonparticipation for caregiving has been especially large for Black and Hispanic mothers, and it accounts for much of the larger decline in the LFPR for these groups.[8]

(continued on next page)

(Washington: Congressional Budget Office, March), https://www.cbo.gov/system/files/115th-congress-2017-2018/workingpaper/53616-wp-laborforceparticipation.pdf.

4. The Federal Reserve Board staff estimates presented in figures B and C are derived from non–labor force participants' responses in the CPS to the question "What best describes your current situation at this time?"; some possible responses include "in retirement," "disabled," "in school," and "taking care of house or family." These figures do not correspond exactly with figure A because figures B and C use data through May 2021 (which is the latest month for which CPS microdata were available at the time of writing) and show data that are not seasonally adjusted. Figures B and C display two-month averages because these data can have considerable noise at monthly frequency.

5. Nonparticipation in the labor force associated with caregiving is measured as nonparticipants in the CPS who report "taking care of house or family" as their current situation.

6. Indeed, according to the Return to Learn Tracker (R2L), even as of June 7, 2021, only 54 percent of districts provided fully in-person education. More information is available on the R2L website at https://www.returntolearntracker.net.

7. The increase in nonparticipation due to caregiving concerns for women with younger children may reflect the lack of available childcare facilities during much of the pandemic. For adults without their own school-age children, the increase may reflect that some of these individuals have also likely had to stop working or looking for work in order to assist with children of relatives or with elderly or disabled relatives rather than risk care outside of the home. Indeed, the increase in nonparticipation for caregiving reasons among women who are not mothers is larger for those with other adult household members who report being disabled or are aged 65 or older.

8. These differences may in part reflect that the groups with larger increases in nonparticipation due to caregiving were less likely to work in telecommute-capable occupations before COVID-19; for example, based on May 2021 Federal Reserve Board staff estimates from the CPS, 19 percent of white mothers aged 25 to 54 with kids aged 6 to 17 report telecommuting due to COVID, compared with 15 percent of Black mothers and 12 percent of Hispanic mothers. It may also

Uneven Recovery *(continued)*

Fear of the COVID-19 virus: Individuals' fears of contracting the COVID-19 virus are likely also still depressing labor force participation somewhat and may in part be reflected in the factors previously discussed; COVID-19 fears may be especially relevant for those who would otherwise be working on-site in high-contact industries and occupations—and even for some fully vaccinated individuals, such as older and immunocompromised workers who are at higher risk for severe illness or death from COVID-19. Consistent with the importance of this reason, data from the Census Bureau's Household Pulse Survey show that between May 26 and June 7, 2021, about 1 percent of the population reported not working or having recently looked for work because of fears of COVID-19.[9] This share was higher for Blacks and Hispanics, those aged 18 to 24, and individuals with no college education, which aligns with demographic differences in the share of individuals employed in high-contact industries before COVID-19 and with differences in individuals' ability to work from home.

Expanded unemployment insurance: The pandemic recession prompted an unprecedented expansion in the availability and level of support of UI. A suite of federal programs has extended benefits to groups normally ineligible for UI, increased the potential duration of benefits, and boosted the weekly benefit amounts received by UI claimants.[10] Complementing the new programs, many states broadened UI eligibility at the start of the pandemic by temporarily suspending work search requirements and relaxing other eligibility criteria. While the income support from expanded UI and other fiscal stimulus likely led some jobseekers to search less intensively or to be more selective in accepting job offers, the effects of these programs on labor force participation are not clear.[11] The support from enhanced UI has been especially consequential for lower-wage workers, who have borne the brunt of recent job losses and who have benefited most from broader coverage and higher benefit levels.[12]

The path ahead: Many of the factors constraining labor force participation should gradually abate in the coming months, and, as they do, the overall participation rate should rise and the demographic disparities in labor force participation that widened during the pandemic will likely continue to narrow. Fears of getting or spreading COVID-19 are likely to recede if vaccination rates continue to climb and if caseloads continue to diminish, and caregiving responsibilities should ease if most students return to in-person instruction in the fall. With federal pandemic UI programs slated to end in September and many states withdrawing from them in advance of their nationwide expiration, any effects of enhanced UI benefits on labor force participation will likely wane soon as well. The spate of retirements spurred by the pandemic will continue to weigh on labor force participation for some time, but this factor should leave a gradually diminishing imprint over the next few years, because these workers were likely poised to retire soon even in the absence of the pandemic. The full effect of the pandemic on the structure of the labor market remains to be seen, and the characteristics of maximum employment may well be different from those of early 2020.

reflect that in-person education was less common in school districts with a larger share of Black and Hispanic students; for example, data from the Return to Learn Tracker for June 7 show that fully in-person education was more common in majority-white school districts than majority-Black or majority-Hispanic school districts.

9. The data are Federal Reserve Board staff calculations from week 31 of the Household Pulse Survey Public Use File. The percentage not working due to fears of COVID-19 is measured as the percentage of respondents who say that their main reason for not working was concern about "getting or spreading the coronavirus." The data can be found on the Census Bureau's website at https://www.census.gov/programs-surveys/household-pulse-survey/datasets.html.

10. These programs are Pandemic Unemployment Assistance (PUA), which provides benefits to pandemic-affected individuals with insufficient wage and salary earnings to qualify for regular UI benefits; Pandemic Emergency Unemployment Compensation (PEUC), which provides additional weeks of coverage to workers who exhaust their regular UI benefits; and Federal Pandemic Unemployment Compensation (FPUC), which currently provides $300 in supplemental benefits to all UI claimants, including those in the PUA and PEUC programs. See Tomaz Cajner, Andrew Figura, Brendan M. Price, David Ratner, and Alison Weingarden (2020), "Reconciling Unemployment Claims with Job Losses in the First Months of the COVID-19 Crisis," Finance and Economics Discussion Series 2020-055 (Washington: Board of Governors of the Federal Reserve System, July), https://doi.org/10.17016/FEDS.2020.055.

11. Research into the labor market effects of pandemic UI policy has largely centered on FPUC, rather than the broader set of state and federal policy changes, and has focused on employment rather than labor market participation. Several recent studies have found that $600 weekly benefit increases under FPUC had at most a modest effect on employment last year, in part because UI generosity has less effect on hiring when the labor market is slack. (See, for example, Nicolas Petrosky-Nadeau and Robert G. Valletta (2021), "UI Generosity and Job Acceptance: Effects of the 2020 CARES Act," Working Paper Series 2021-13 (San Francisco: Federal Reserve Bank of San Francisco, June), https://www.frbsf.org/economic-research/files/wp2021-13.pdf.) Less is known about the possible effects of FPUC, PEUC, and PUA on labor force participation, particularly in the tighter labor market conditions prevailing in 2021.

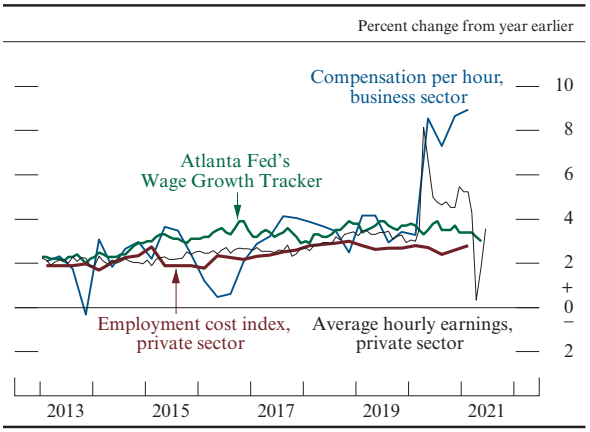
12. The $300 FPUC supplement to weekly UI benefits replaces a larger portion of lost earnings for workers displaced from lower-wage jobs, while PUA has made benefits available to self-employed workers, labor market entrants, and other groups with limited earnings histories.

of the year, lifting the 12-month change up to 2.8 percent (figure 7). More timely indicators show continuing large wage gains, though swings in the composition of the workforce make these difficult to interpret.[2] In particular, average hourly earnings exhibited very large monthly increases in April, May, and June despite being held down in those months by large job gains in industries with below-average wages. Compensation per hour in the business sector, a broad-based but volatile measure of wages, salaries, and benefits, rose 8 percent through the first quarter, bolstered significantly by changes in the composition of the workforce.[3]

. . . and price inflation has stepped up, boosted by returning demand and by supply bottlenecks . . .

As measured by the 12-month change in the price index for personal consumption expenditures (PCE), inflation jumped from 1.2 percent in December 2020 to 3.9 percent in May, well above the FOMC's longer-run objective of 2 percent (figure 8). The closely watched core PCE price index, which excludes more volatile components, rose 3.4 percent over the 12 months ending in May. The price acceleration appears to have arisen largely from a small number of categories, as suggested by muted movements in the Dallas trimmed mean index, which removes the largest price changes.[4] For example, sharp price

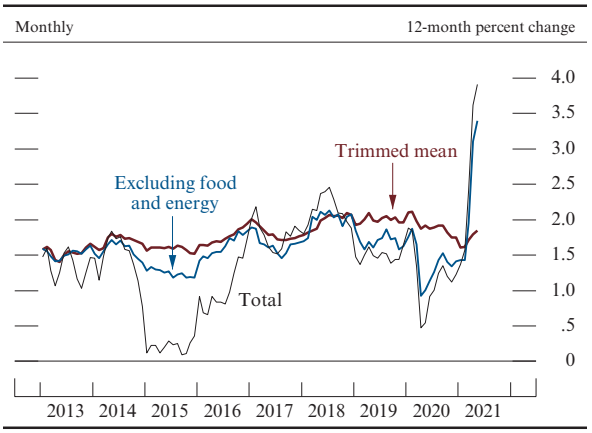
7. Measures of change in hourly compensation



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 extend through June 2021; 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.

8. Change in the price index for personal consumption expenditures



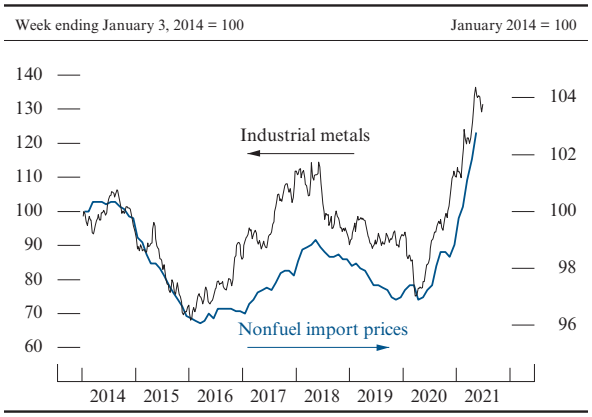
SOURCE: For trimmed mean, Federal Reserve Bank of Dallas; for all else, Bureau of Economic Analysis; all via Haver Analytics.

2. Early in the pandemic, job losses were much larger for lower-wage workers, raising average wages and measured wage growth. This process is now being reversed as many lower-wage workers, particularly in services, have been rehired, thus lowering average wages and measured wage growth. Consequently, in the 12-month changes, large composition effects obscure the underlying movements in wages of typical workers.

3. Over the same period, labor productivity in the business sector is estimated to have increased 4 percent, much faster than the pre-pandemic trend. Both compensation and productivity have been affected by changes in the composition of inputs and outputs that may be largely transitory. Nevertheless, some of the increases may reflect more persistent factors.

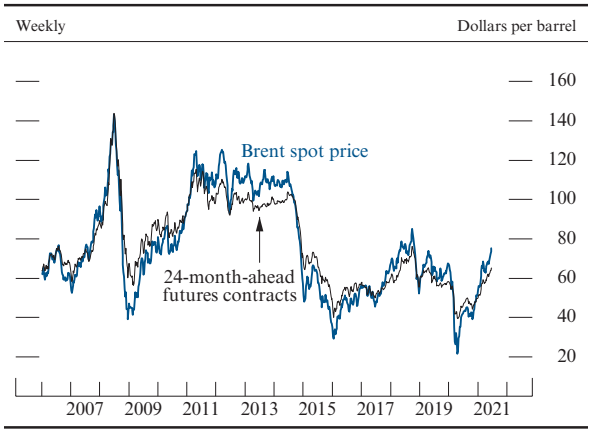
4. The trimmed mean omits the highest and lowest price changes, removing products representing roughly half of the PCE basket by consumption share.

9. Nonfuel import prices and industrial metals indexes



NOTE: The data for nonfuel import prices are monthly. The data for industrial metals are weekly averages of daily data and extend through July 2, 2021.
SOURCE: For nonfuel import prices, Bureau of Labor Statistics; for industrial metals, S&P GSCI Industrial Metals Spot Index via Haver Analytics.

10. Spot and futures prices for crude oil



NOTE: The data are weekly averages of daily data and extend through July 2, 2021.
SOURCE: ICE Brent Futures via Bloomberg.

increases for goods have been concentrated among a subset of products experiencing strong demand coupled with supply chain bottlenecks. In addition, as demand for services has returned to normal, some prices have bounced back from levels depressed following the onset of the pandemic. (See the box "Recent Inflation Developments.")

. . . with further upward pressure on inflation from rising import prices

Increased import prices also contributed to the step-up in consumer price inflation in the first half of 2021, boosted by commodity prices, which rose in response to strong demand for goods. The effects of higher import prices have been exacerbated by bottlenecks abroad that have raised transport costs (figure 9). (See the box "Supply Chain Bottlenecks in U.S. Manufacturing and Trade.")

After a sharp recovery in late 2020 and early 2021, oil prices have risen over $10 per barrel in the past few months, a substantial increase but less dramatic than some of the increases for nonfuel commodity prices. Even though oil consumption is still well below pre-pandemic levels, oil production is also down, and oil prices are now above pre-pandemic levels (figure 10). Oil demand continues to be held back by the slow recovery in travel and commuting. Meanwhile, OPEC (Organization of the Petroleum Exporting Countries) and its partners, notably Russia, have only slowly increased their production toward pre-pandemic levels, offsetting the effect of weak demand.

Survey-reported inflation expectations and market-based inflation compensation measures have moved up in recent months

Survey-based measures of inflation expectations at medium- and longer-term horizons have moved up over the first half of the year. These measures, which exhibited a downward drift in recent years, have returned to levels last observed 5 to 10 years ago. Similarly, market measures of longer-term

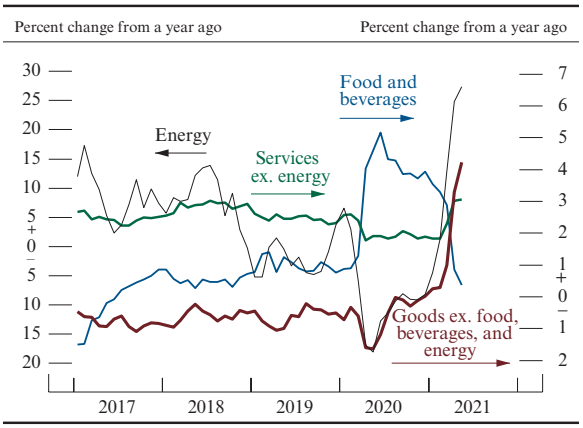
Recent Inflation Developments

Since the beginning of this year, personal consumption expenditures (PCE) inflation—as measured by 12-month percent changes—has increased markedly, reaching 3.9 percent in May (figure 8 in the main text). The sharp increase in inflation this year reflects both a rebound in prices from pandemic-induced price declines last spring and imbalances between demand and supply associated with a strong increase in aggregate demand amid supply chain bottlenecks, hiring difficulties, and other capacity constraints.

As global demand has surged, prices for crude oil and other traded commodities, such as livestock, crops, and metals, have increased notably (figures 9 and 10 in the main text). Commodity prices started to rebound during the second half of last year as the global economy partially reopened and have continued to rise this year, in some cases reaching multiyear highs. These prices most directly affect food and energy consumer prices (the blue and black lines, respectively, in figure A). However, readings from manufacturing surveys and anecdotes reported in the Federal Reserve's Beige Book suggest rising costs for raw materials have contributed to inflation for other goods as well (the red line in figure A). More recently, prices of some commodities, such as lumber, have come down from their peaks in the spring or have flattened out, suggesting that inflation pressures from commodities might ease in the coming months or even reverse.

Supply chain bottlenecks are another factor pushing up consumer prices this year. As the economy reopened and as consumer demand for goods surged, many producers have reported shortages of critical parts and packaging materials, as well as delivery delays. (See the box "Supply Chain Bottlenecks in U.S. Manufacturing and Trade.") Supply chain bottlenecks have been particularly constraining in the motor vehicle sector, where global shortages of semiconductors and other parts have curtailed production, at the same time that demand by households and rental companies has been strong. Prices for motor vehicles—particularly used vehicles—have jumped in recent months and are currently at levels well above their pre-COVID-19 trends (figure B, top-left panel). Strong demand amid supply chain bottlenecks has also boosted prices for other durable goods in recent months, but the pattern is not quite as pronounced as it is for motor vehicles (figure B, top-right panel). In fact, the rise in prices

A. Personal consumption expenditures price indexes



NOTE: The data are monthly.
SOURCE: Bureau of Labor Statistics via Haver Analytics.

connected to the motor vehicle sector—including prices for new and used vehicle purchases and vehicle rental services—accounts for almost one-third of the increase in PCE prices in April and May.

Regarding services prices, demand for certain non-energy services that were severely curtailed by social distancing during the pandemic has surged this spring as the vaccines have become widely available (the green line in figure A). Just as the drop in demand last year led to a step-down in prices for categories related to travel and group activities, the resurgence in demand for these services is pushing up prices this year. As two prominent examples, airline fares and prices for hotel accommodations have jumped since the beginning of the year but so far remain somewhat below their pre-COVID trends (figure B, bottom panels).

Even as demand for services appears to be strong and growing, many service-sector businesses have reported difficulties in finding workers quickly enough to ramp up their operations accordingly. These reports are consistent with most available measures of wage growth, which have stepped up notably since the beginning of the year. Wage gains have been especially large in the leisure and hospitality sector and in other service industries that have relatively low average wages, which has likely contributed to the rise in inflation for certain categories of spending, such as food away from home.

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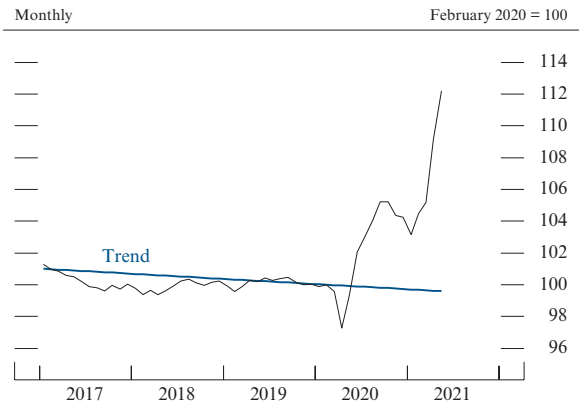
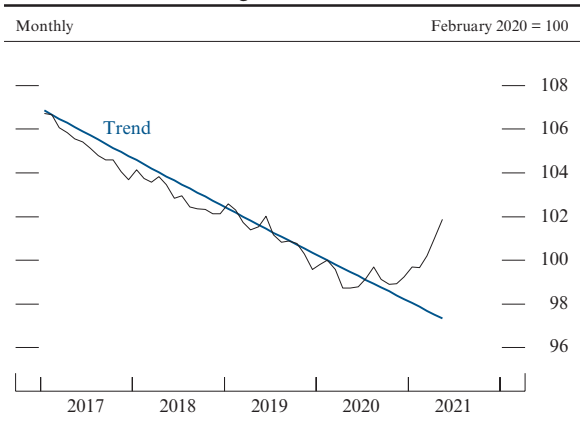
Recent Inflation Developments *(continued)*

B. Personal consumption expenditures prices and pre-COVID-19 trends

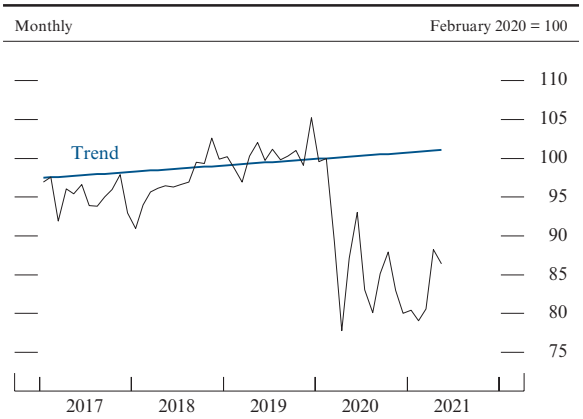
B1. Motor vehicles



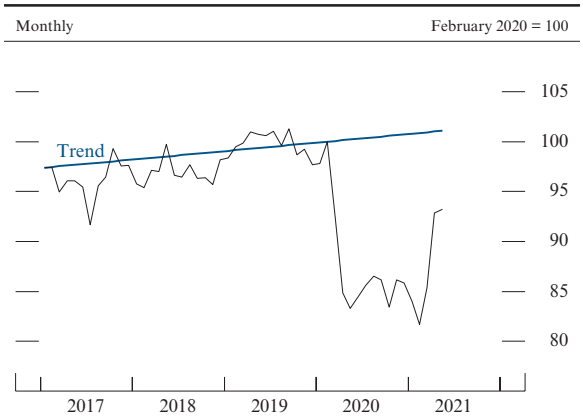
B2. Durables excluding motor vehicles



B3. Airline fares



B4. Hotel accommodations



NOTE: Trend is calculated from February 2017 to February 2020.
SOURCE: Bureau of Economic Analysis via Haver Analytics; FRB calculations.

Overall, an important part of the rise in inflation this spring appears to be due to a surge in demand, including the rebound in travel-related spending, running up against short-run production bottlenecks and hiring difficulties. As these extraordinary circumstances pass, supply and demand should become better aligned, and inflation is widely expected to move down toward the FOMC's 2 percent longer-run goal. (For a more detailed discussion of recent developments in inflation expectations, see the box "Assessing the Recent Rise in Inflation Expectations.")

Supply Chain Bottlenecks in U.S. Manufacturing and Trade

The strong U.S. demand for goods has been faced with a supply chain that has struggled to keep pace. With the onset of the pandemic in the spring of 2020, many manufacturers sharply curtailed production in expectation of a long downturn and a drawn-out recovery. Companies laid off workers, idled plants, and canceled orders for materials. In many cases, however, the pause in demand was much shorter and the rebound in demand was much stronger than anticipated, and by late 2020, factories in some industries were scrambling to find the workers, parts, and materials to fill a rush of new orders. As demand for goods surged in the second half of 2020, U.S. import volumes shot up to record levels and have remained elevated. The massive influx of goods combined with COVID-19-related staffing issues have overwhelmed U.S. ports, resulting in additional challenges for manufacturers that experience extended wait times for imported parts.

Ample evidence—including widespread anecdotes of shortages mentioned in the press and in the Federal Reserve's Beige Book—points to broad and sometimes deep supply chain disruptions across the manufacturing sector. The challenges in procuring materials are also reflected in reports from the Institute for Supply Management on order backlogs, which recently reached historical highs at the same time as customer inventories were at historical lows (figure A).[1] Additionally, roughly one-fourth of all manufacturers cannot produce at full capacity because of an insufficient supply of materials, labor, or both (figure B).[2] Amid strong demand, these shortages have put upward pressure on the prices manufacturers pay for parts and materials (figure C).

A few key manufacturing industries have experienced pronounced supply disruptions or shortfalls. Perhaps most notably, the burst in demand for consumer electronics contributed to full order books, long lead times, and shortages of semiconductors; these shortages led to widespread shutdowns and slowdowns at several U.S. motor vehicle assembly plants.[3] Lumber supply has also fallen

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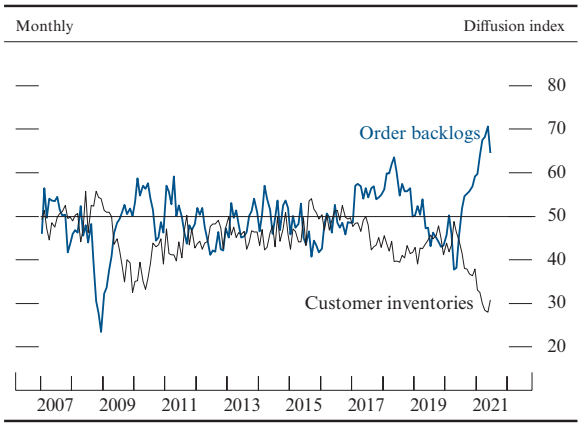
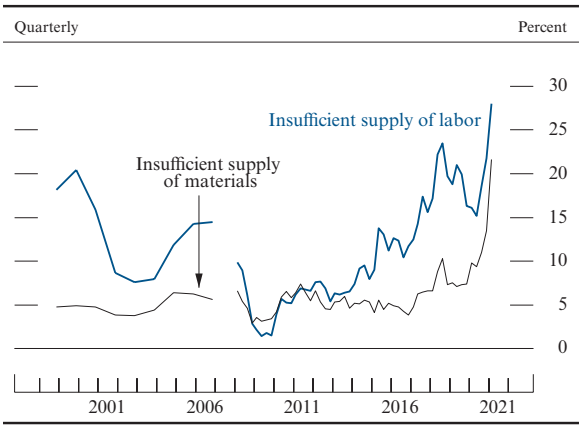
A. Customer inventories and order backlogs



NOTE: The data extend through June 2021.
SOURCE: Institute for Supply Management, Manufacturing ISM *Report on Business*.

B. Reasons production is below capacity



NOTE: Gaps in series represent the end of the Annual Survey of Plant Capacity in 2006 and the start of the Quarterly Survey of Plant Capacity in 2008.
SOURCE: Census Bureau, Manufacturing and Construction Division, Quarterly Survey of Plant Capacity Utilization.

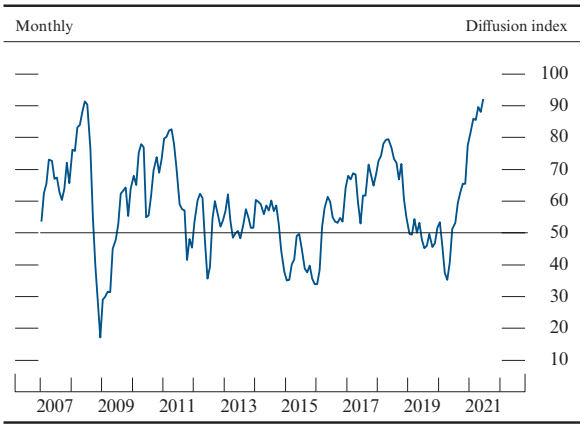
1. The Institute for Supply Management survey asks respondents whether their customers' inventories are currently "too high," "too low," or "about right." Values below 50 indicate more respondents perceived customers' inventories as "too low" than "too high." Similarly, respondents are asked to compare the current month's backlog of orders with the previous month's backlog; values above 50 suggest more respondents reported higher backlogs than reported lower backlogs.

2. Labor shortages appear increasingly problematic. Although manufacturers have long expressed challenges in attracting and retaining workers, the most recent reading from the Bureau of Labor Statistics reported 814,000 job openings in the sector, nearly double the 2017–19 average.

3. The semiconductor shortage was exacerbated when a chip factory in Japan closed for about a month in the spring after being damaged by a fire; the company announced that it expects shipments to return to pre-fire levels in late July.

Supply Chain Bottlenecks *(continued)*

C. Prices paid by manufacturers for materials



NOTE: Values greater than 50 indicate that more respondents paid higher prices for material inputs relative to a month earlier than reported lower prices. The data extend through June 2021.

SOURCE: Institute for Supply Management, Manufacturing ISM *Report on Business.*

short, as last year's increase in remodeling projects and new home construction outpaced production at sawmills. Meanwhile, supply bottlenecks for steel emerged last fall after a resurgence in orders surprised mill operators that had not yet fully restarted steelmaking equipment idled in the early days of the pandemic.[4] Finally, extremely cold temperatures in mid-February caused extensive damage to several petrochemical facilities along the Gulf Coast, resulting in acute shortages; the outages resolved slowly, and only in early May did operations essentially return to normal.

Logjams at some of the nation's ports—particularly on the West Coast—resulted from the unprecedented volume of imports and were compounded by limitations on labor attributable to COVID-19 precautions and to isolated outbreaks among dock workers. For example, since the fall of 2020, the Port of Los Angeles, the nation's busiest port, has had more ships to unload than it could easily accommodate. Typically, ships have little to no wait before they reach a berth at the port, but since last October, on average, more than 10 ships have been waiting at anchor at any given time (figure D). While this number has retreated from its peak, ships are still spending an extended time in the port. Continued high import volumes have hampered the port's progress in resolving congestion even as the quick pace of vaccinations in the United States has allowed the port to resume processing incoming containers at full capacity.

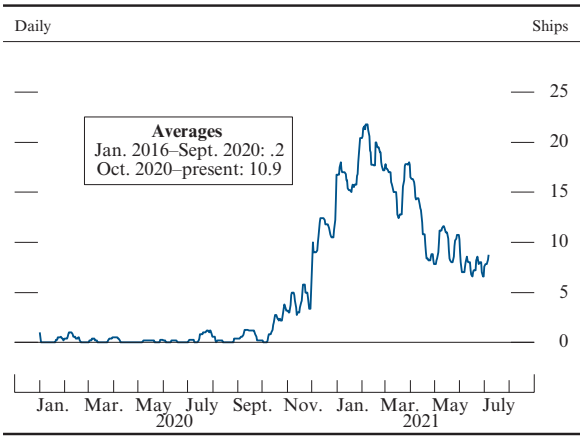
In addition to the congestion at ports, carriers have raised shipping rates and imposed large surcharges on containers sent to the United States.[5] These delays and elevated costs have likely discouraged additional imports of low-value, high-volume products, contributing to higher prices and reduced inputs for

(continued)

4. More than half of the nation's blast furnaces were idled last year, and a few were permanently shuttered; the vast majority of the idled furnaces were restarted by this spring.

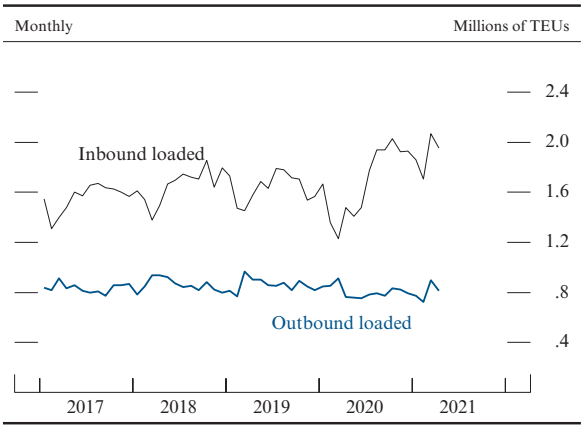
5. Air freight rates have also risen sharply, as many goods normally shipped by sea are being transported by air to avoid extended delays. Furthermore, pandemic-related restrictions on international travel have limited the number of international flights, reducing the supply of cargo space for air shipments and further increasing prices.

D. Ships waiting at anchor (Port of Los Angeles)



NOTE: The data are 7-day moving averages.
SOURCE: Port of Los Angeles.

E. Container flows at U.S. ports

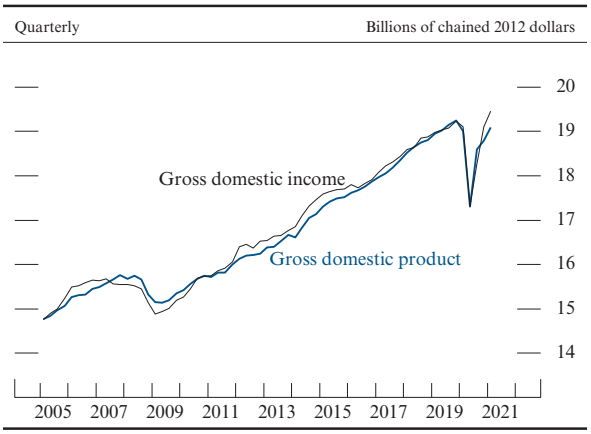


NOTE: The data extend through April 2021. The data include the ports of Baltimore, Charleston, Houston, Los Angeles, Long Beach, New York and New Jersey, Oakland, Savannah, Seattle, and Tacoma, which accounted for 91 percent of total throughput at U.S. ports in 2019. TEUs are 20-foot equivalent units.
SOURCE: Maryland Port Administration; South Carolina Ports Authority; Port of Houston Authority; Port of Los Angeles; Port of Long Beach; Port of New York and New Jersey; Port of Oakland; Georgia Ports Authority; Northwest Seaport Alliance; all via Haver Analytics; Federal Reserve Board staff calculations.

U.S. manufacturers. Relatedly, the higher inbound rates have created a challenge for U.S. exports in the form of a container shortage. Shipping rates for U.S. exports have risen by much less than rates for inbound shipments, so carriers find it more profitable at times to quickly return empty containers for another inbound U.S. delivery than to receive modest revenue from taking on U.S. exports. Thus, although the number of inbound loaded containers skyrocketed in the second half of last year, the number of outbound loaded containers stayed below pre-pandemic levels until March 2021 (figure E).

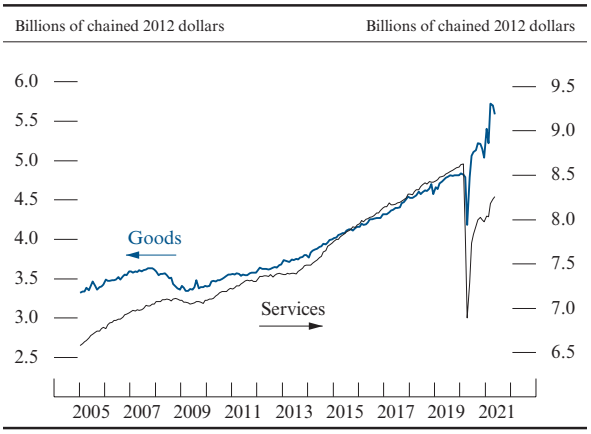
In summary, trade and production bottlenecks have been an important factor as the economy emerges from the pandemic. As producers and the distribution network work through these bottlenecks, production is expected to pick up and price pressures to ease—for example, lumber prices have come down from their late-spring peaks. The time frame for the resolution of these bottlenecks is uncertain, as they reflect both the global supply chain and some industry-specific reasons for the tight conditions.

11. Real gross domestic product and gross domestic income



SOURCE: Bureau of Economic Analysis via Haver Analytics.

12. Real personal consumption expenditures



NOTE: The data are monthly.
SOURCE: Bureau of Economic Analysis via Haver Analytics.

inflation compensation—including inflation swaps and the yield gap between nominal Treasury securities and Treasury Inflation-Protected Securities—continued to climb in 2021, returning to the range observed in the 2010–14 period. (See the box "Assessing the Recent Rise in Inflation Expectations.")

Gross domestic product surged in the first half of the year . . .

Real gross domestic product (GDP) rose at a brisk annual rate of 6½ percent in the first quarter and, with indicators suggesting another strong increase in the second quarter, appears to have now recovered to its pre-pandemic level (figure 11). Even so, supply chain bottlenecks, hiring difficulties, and other capacity constraints have damped the economic rebound to some degree this year, causing order backlogs and longer delivery times and leading producers to meet demand in part by drawing down inventories rather than from new production.

. . . driven by a sharp increase in household spending . . .

The rebound in GDP primarily reflects a resurgence of household spending, driven by the reopening of the economy and additional fiscal support. In particular, the easing of voluntary and mandatory social distancing has spurred an increase in services spending, such as more prevalent dining out, hotel stays, and air travel (figure 12). Still, concerns about COVID-19 continue to limit in-person interactions, and services spending has yet to reach its pre-pandemic level. Spending on goods, which quickly recovered in the second half of 2020, soared from January through May. Spending on durable goods has been especially strong, including on motor vehicles, where sales reached levels among the highest on record in March and April before being held back in May by extremely low dealer inventories.

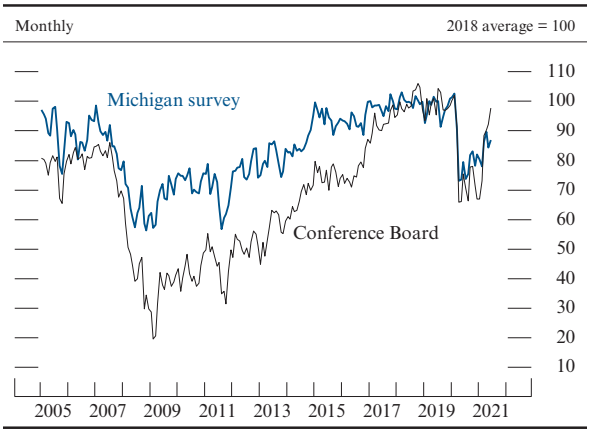
. . . supported by rising personal income, consumer sentiment, and wealth . . .

The marked increase in personal consumption has been supported by increasing income, accumulated savings, rising housing and stock market wealth, low interest rates, and improving consumer sentiment (figure 13). Disposable personal income—that is, household income net of taxes—surged in the first quarter of this year, boosted by further fiscal support, including stimulus checks and enhanced unemployment insurance benefits, along with solid gains in wages and compensation. Meanwhile, the continuing brisk rise in house prices and stock prices has boosted the wealth of homeowners and equity investors (figure 14). The tremendous gains in income have led to a very elevated saving rate (figure 15). That said, these aggregate figures mask important variation across households, and many low-income households, especially those whose earnings declined as a result of the pandemic and recession, have seen their finances stretched.

. . . and ready access to credit for households with good credit profiles

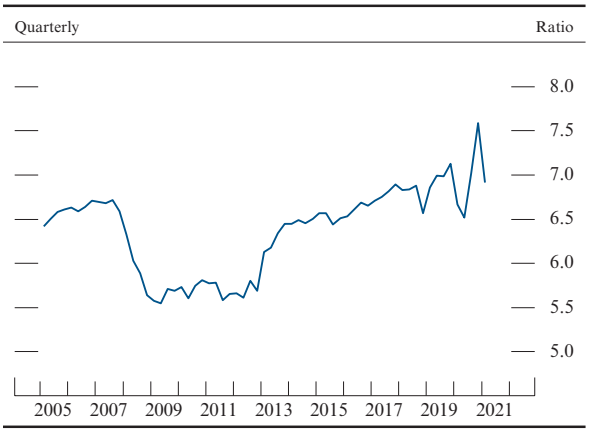
Household borrowing has expanded moderately. Consumer loans have grown at a modest pace so far this year, driven by the continued expansion of auto loans (figure 16). Banks reported significant easing of lending standards on consumer loans in the first quarter of 2021 after a moderate easing in the last quarter of the previous year, though standards remain tight relative to the period just before the pandemic. Delinquency rates for nonprime auto and credit card borrowers remained well below pre-pandemic levels, likely stemming from forbearance programs and fiscal support. Mortgage credit is broadly available to high-credit-score borrowers who meet standard conforming loan criteria but continues to be tight for borrowers with lower credit scores. Historically low mortgage rates have led to elevated refinance and purchase activity, supported by accommodative credit

13. Indexes of consumer sentiment



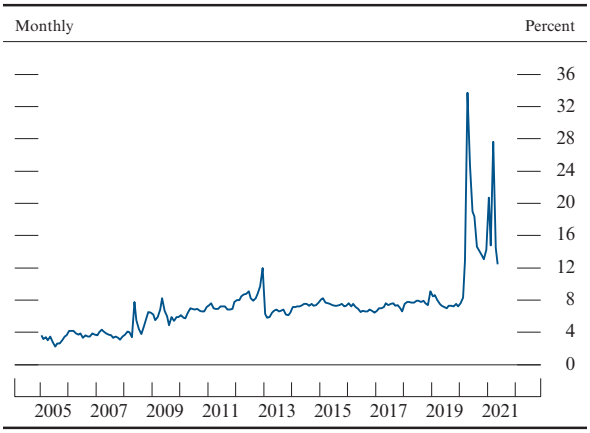
NOTE: The data extend through June 2021.
SOURCE: University of Michigan Surveys of Consumers; Conference Board.

14. 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.

15. Personal saving rate



SOURCE: Bureau of Economic Analysis via Haver Analytics.

Assessing the Recent Rise in Inflation Expectations

The sharp rise in inflation so far this year (see the box "Recent Inflation Developments") has raised the question of whether the recent elevated pace of price increases (1) will abate, as the effects of the strong rebound in aggregate demand and accompanying supply chain bottlenecks fade, without calling for a change in the path of monetary policy or (2) will instead be followed by a period of higher inflation pressures and call for a change in the stance of monetary policy. The latter situation could arise if longer-term inflation expectations were to rise persistently above levels consistent with the Federal Open Market Committee's (FOMC) longer-run inflation goal. Inflation expectations are often seen as a driver of actual inflation, which is why a fundamental aspect of the FOMC's monetary policy framework is for longer-term inflation expectations to be well anchored at the Committee's 2 percent longer-run inflation objective.[1] In monitoring the inflation outlook, the FOMC considers a variety of financial and economic data in order to gauge whether inflation expectations are consistent with meeting its inflation objective. Recent readings on these measures indicate that inflation is expected to return to levels consistent with the Committee's 2 percent longer-run inflation objective after a period of temporarily higher inflation. That said, some measures suggest that the upside risks to the inflation outlook in the near term have increased.

Information concerning inflation expectations can be obtained from various sources, including financial instruments linked to inflation and surveys of financial market participants, professional forecasters, households, and businesses. For example, the compensation that investors require to hold certain financial instruments whose payouts are linked to inflation sheds light on financial market participants' expectations regarding inflation. Inflation compensation implied by the yields on Treasury securities, known as the Treasury Inflation-Protected Securities (TIPS) breakeven inflation rate, is defined as the difference between yields on conventional Treasury securities and yields on TIPS, which are linked to actual outcomes regarding headline consumer price index (CPI) inflation. An alternative market-based measure of inflation compensation can be derived from inflation swaps, which are contracts in which two parties agree to swap fixed nominal payments for floating cash flows that are tied to cumulative CPI inflation over some horizon.

Longer-horizon TIPS- and swaps-based measures of inflation compensation have both moved up since the start of the year. The TIPS-based measure of 10-year inflation compensation increased from an annual rate close to 2 percent in the beginning of 2021 to somewhat above 2¼ percent in early July. Over the same period, the swaps-based measure increased from around 2¼ percent to 2½ percent. To shed further light on how the recent economic developments are influencing investors' views on the inflation rate likely to prevail at different horizons, it is useful to split the recent rise in inflation compensation over the next 10 years into changes in inflation compensation for the next year and for subsequent 1-year periods starting at times between 1 and 9 years from now. The result of this exercise suggests that market-based measures of inflation compensation over the next year have increased about 1½ percentage points since early 2021, reaching levels above 3 percent in early July. Measures of inflation compensation for the period beyond the next year have also moved up but by a much smaller amount than have measures of 1-year inflation compensation. In particular, inflation compensation beyond five years has reversed the large declines seen earlier in the pandemic, bouncing back to levels consistent with those observed before 2014, when measures of longer-term inflation compensation ran modestly above 2 percent on a CPI basis, and before these measures showed signs that CPI inflation expectations may have drifted down (figure A).

If the recent readings on inflation compensation could be interpreted as direct measures of expected CPI inflation, they would suggest that investors currently anticipate that average CPI inflation will temporarily run somewhat above 3 percent over the next year before moving back down. Over the longer run, assuming no wedge between inflation compensation and inflation expectations, market-based measures indicate that investors are expecting CPI inflation to settle at around 2¼ percent. This pattern is consistent with expectations of CPI inflation moving to levels in line with the FOMC's longer-run inflation goal of 2 percent PCE (personal consumption expenditures) inflation.[2]

TIPS- and swaps-based measures of inflation compensation, however, reflect not only expected

(continued)

1. For a discussion of the role inflation expectations play in inflation dynamics, see Janet L. Yellen (2015), "Inflation Dynamics and Monetary Policy," speech delivered at the Philip Gamble Memorial Lecture, University of Massachusetts, Amherst, September 24, https://www.federalreserve.gov/newsevents/speech/yellen20150924a.htm.

2. The Committee's 2 percent longer-run inflation objective is stated in terms of the PCE price index, and PCE inflation

A. Inflation compensation implied by Treasury Inflation-Protected Securities

NOTE: The data are at a business-day frequency and are based on smoothed nominal and inflation-indexed Treasury yield curves.

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

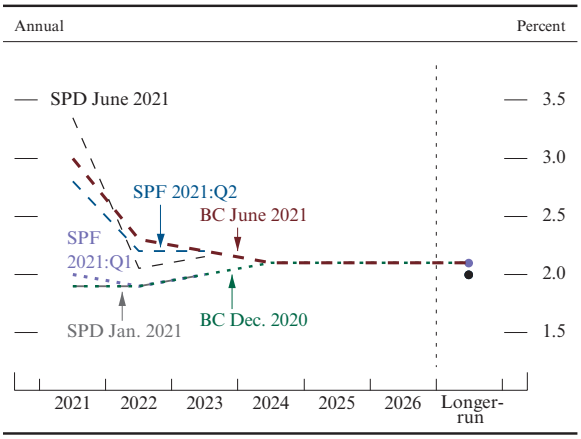
inflation, but also other factors, including the inflation risk premium and possibly other premiums driven by liquidity differences and shifts in demand and supply of TIPS relative to those of nominal Treasury securities. The presence of these additional factors can make it difficult to ascertain the information regarding expected inflation embedded in market-based measures of inflation compensation.[3] Survey-based measures, in contrast, provide information about inflation expectations that is not obscured by the presence of these risk premiums.

Information about inflation expectations obtained from surveys of financial market participants, economists, and professional forecasters tells a story similar to that of market-based measures. Since the turn of the year, projections of PCE inflation for 2021 as a whole, obtained from information in the Blue Chip Financial Forecasts, the Survey of Professional Forecasters, and the Survey of Primary Dealers, increased substantially to well above 2 percent. Over the same period, the projections of PCE inflation beyond 2022 appear, in comparison, to be little changed at levels just over 2 percent (figure B). This pattern suggests that these forecasters expect the recent jump in inflation to be transitory and that survey respondents do not appear to have revised their views regarding the longer-term inflation rate in response to the recent strong readings on inflation.

Even if financial market participants and professional forecasters see inflation returning to levels close to 2 percent after a bout of higher inflation as the most likely outcome, they still could have judged that the likelihood of higher inflation had increased. Probability

(continued on next page)

B. Survey-based measures of personal consumption expenditures inflation expectations



NOTE: The data are for expectations of year-over-year percent changes. The mean of Blue Chip (BC) survey responses and medians of the Survey of Professional Forecasters (SPF) and Survey of Primary Dealers (SPD) are shown. Longer-run expectations are 5-to-10-year expectations for the BC survey and SPF. Gaps represent unreported forecast horizons, and dots represent the longer-run value of the series that have a gap after 2023. The BC and SPF 2021:Q1 series end at 2.1 percent in the longer run, and the SPF 2021:Q2 and the SPD series end at 2.0 percent.

SOURCE: Blue Chip Financial Forecasts; Federal Reserve Bank of Philadelphia, SPF; Federal Reserve Bank of New York, SPD.

tends to run somewhat below CPI inflation, which is used in pricing TIPS and inflation swaps. Over the past two decades, PCE price inflation has run, on average, around ¼ percentage point lower than CPI inflation, though this wedge has varied from year to year.

3. The Federal Reserve System staff maintains several term structure models to disentangle the various components of inflation compensation. For more details, see, for example, Michael Abrahams, Tobias Adrian, Richard K. Crump, Emanuel Moench, and Rui Yu (2016), "Decomposing Real and Nominal Yield Curves," *Journal of Monetary Economics,* vol. 84 (December), pp. 182–200; Jens H.E. Christensen, Jose A. Lopez, and Glenn D. Rudebusch (2010), "Inflation Expectations and Risk Premiums in an Arbitrage-Free Model of Nominal and Real Bond Yields," *Journal of Money, Credit and Banking,* vol. 42 (September), pp. 143–78; Stefania D'Amico, Don H. Kim, and Min Wei (2018), "Tips from TIPS: The Informational Content of Treasury Inflation-Protected Security Prices," *Journal of Financial and Quantitative Analysis,* vol. 53 (February), pp. 395–436; and Andrea Ajello, Luca Benzoni, and Olena Chyruk (2020), "Core and 'Crust': Consumer Prices and the Term Structure of Interest Rates," *Review of Financial Studies,* vol. 33 (August), pp. 3719–65.

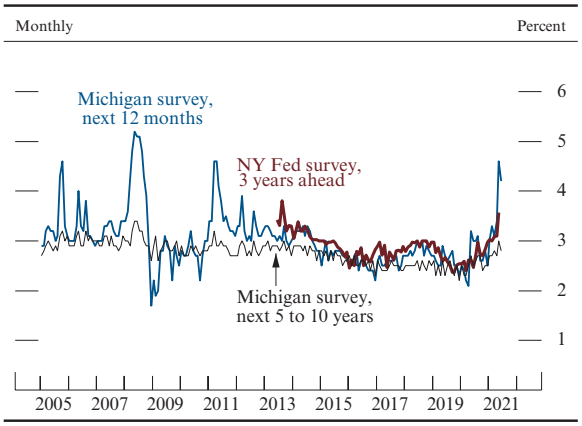
Rise in Inflation Expectations *(continued)*

distributions of future inflation derived from surveys provide information on how respondents' views about the likelihood of various outcomes for inflation have evolved. Since the turn of the year, the probability distribution of PCE inflation for 2022 derived from the Survey of Professional Forecasters suggests that the average respondent now appears to attach lower probabilities to outcomes of inflation below 2 percent, and somewhat higher odds of inflation running above 3 percent, which suggests that respondents' perceived upside risks to inflation in the near term have shifted up somewhat.[4]

Finally, survey-based measures of households' inflation expectations have also moved up in recent months. And, similarly to the other surveys, the movements have been more pronounced in the near- to medium-term inflation expectations. In the University of Michigan Surveys of Consumers, households' expectations for inflation over the next 12 months in June were markedly higher than in February and well above the expectations for average inflation over the next 5 to 10 years (figure C). Over the same period, the median value of inflation expectations over the next 5 to 10 years picked up only slightly. Nevertheless, the latest reading is above its pre-pandemic level and stands close to levels last seen consistently in 2015 when this measure started drifting down and raised concerns that households' expectations might have slipped below the FOMC's 2 percent longer-run goal. In the Survey of Consumer Expectations, conducted by the Federal Reserve Bank of New York, the median of respondents' expected inflation rate 3 years ahead also increased sharply in May, the highest reading since the summer of 2013.

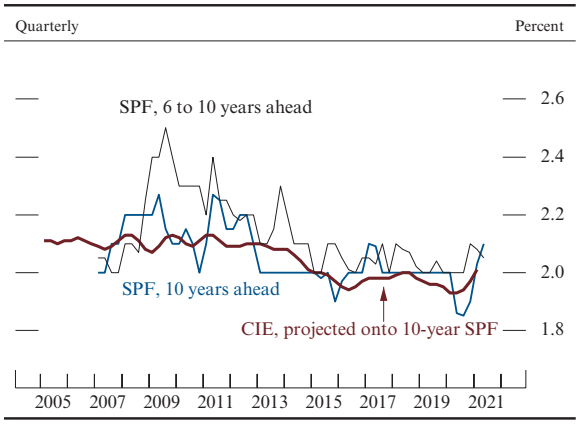
The common inflation expectations (CIE) index constructed by Federal Reserve Board staff—a series that takes many measures of inflation expectations and inflation compensation and consolidates them into a single indicator—has continued to edge up in recent quarters, more than reversing the moderate decline recorded in the middle of last year (figure D).[5] Taking a somewhat longer view, the CIE has now also reversed the net decline since 2014 and has brought the index up to levels that are likely more consistent with the FOMC's longer-term goal of 2 percent PCE inflation.

C. Survey measures of consumers' inflation expectations



NOTE: The series are medians of the survey responses. The NY Fed data begin in June 2013. The Michigan survey data extend through June 2021.
SOURCE: University of Michigan Surveys of Consumers; Federal Reserve Bank of New York, Survey of Consumer Expectations.

D. Survey of Professional Forecasters inflation expectations and Index of Common Inflation Expectations



NOTE: The Survey of Professional Forecasters (SPF) data begin in 2007:Q1 and extend through 2021:Q2.
SOURCE: Federal Reserve Bank of Philadelphia, SPF; Federal Reserve Board, Index of Common Inflation Expectations (CIE).

4. Of note, distributions of CPI inflation 5 to 10 years ahead derived from the Federal Reserve Bank of New York's Survey of Primary Dealers and Survey of Market Participants have remained stable over the year, consistent with the stability of survey-based measures of longer-run inflation expectations.

5. For more details, see Hie Joo Ahn and Chad Fulton (2021), "Research Data Series: Index of Common Inflation Expectations," FEDS Notes (Washington: Board of Governors of the Federal Reserve System, March 5), https://doi.org/10.17016/2380-7172.2873.

standards for high-credit-score borrowers (figure 17).

The housing sector remains remarkably strong

Residential investment surged following the shutdown last spring and has remained at a high level since then. Low mortgage rates have boosted demand, as have adaptations to the pandemic, including working from and spending more time at home. New construction, home sales, and residential improvements have all been well above pre-pandemic levels, and demand has outpaced supply, as construction has been limited by material shortages and sales have been constrained by low inventories (figures 18 and 19). This tension has fueled a sizable rise in home prices and driven down the inventory of homes for sale to extraordinarily low levels (figure 20).

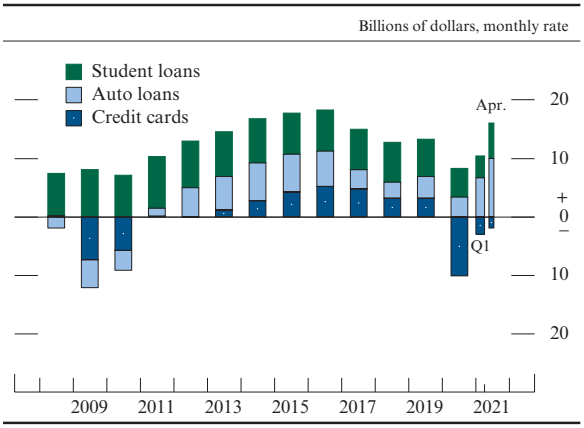
Business investment has recovered from its plunge last year and continues to rise at a solid pace . . .

Solid business investment in the first half of the year has been supported by the unwinding of pandemic disruptions, accommodative monetary policy and fiscal support, and the strong business outlook. Investment in equipment and intangibles has led the rise in investment, especially investment in high-technology equipment and software driven by the shift to remote work and other changes to business practices. Investment in structures in the oil and gas sector also has risen in recent quarters, spurred by a turnaround in oil prices. In contrast, investment in structures outside of the drilling and mining sector has been subdued after falling sharply last year (figure 21).

. . . amid financing conditions that remain accommodative for nonfinancial corporations

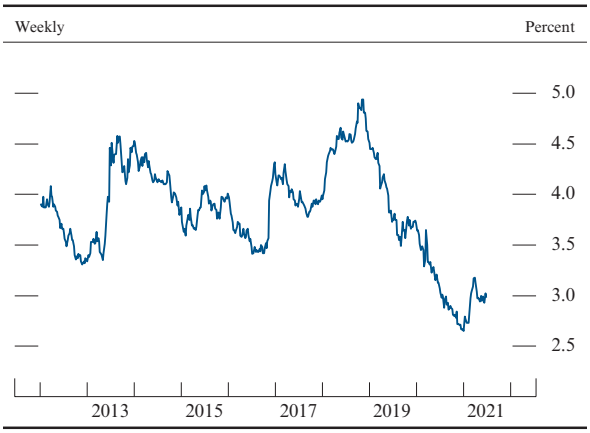
Financing conditions for nonfinancial firms through capital markets have remained broadly

16. Consumer credit flows



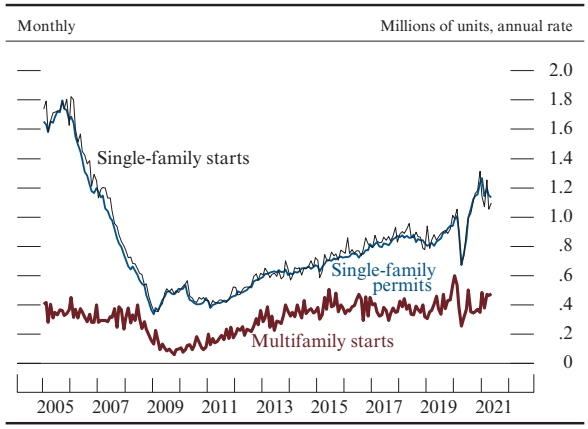
NOTE: The data are seasonally adjusted by the Federal Reserve Board.
SOURCE: Federal Reserve Board, Statistical Release G.19, "Consumer Credit."

17. Mortgage rates



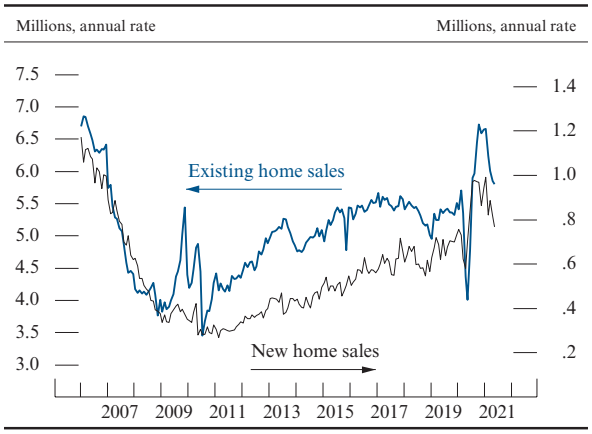
NOTE: The data are contract rates on 30-year, fixed-rate conventional home mortgage commitments and extend through July 1, 2021.
SOURCE: Freddie Mac Primary Mortgage Market Survey.

18. Private housing starts and permits



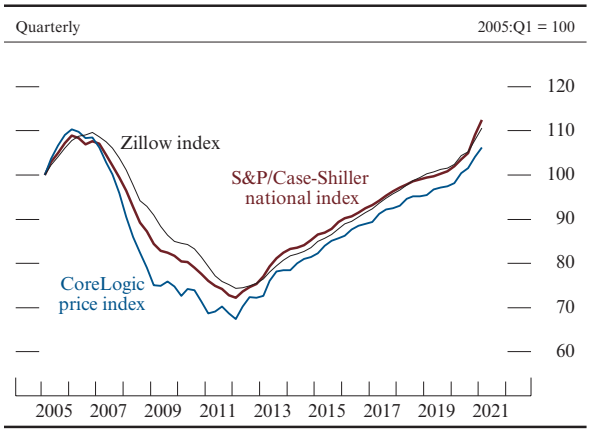
SOURCE: Census Bureau via Haver Analytics.

19. New and existing home sales



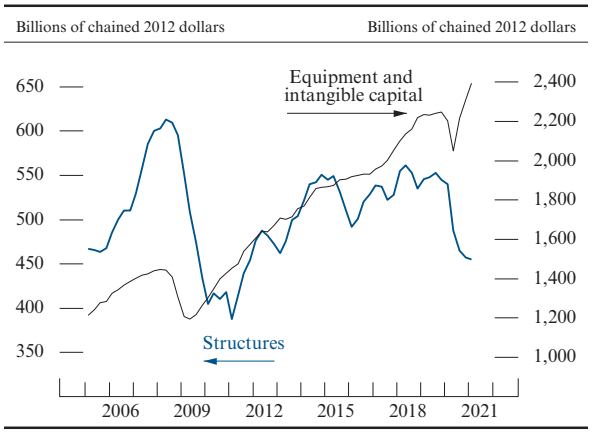
NOTE: The data are monthly. New home sales include only single-family sales. Existing home sales include single-family, condo, and co-op sales.
SOURCE: For new home sales, Census Bureau; for existing home sales, National Association of Realtors; all via Haver Analytics.

20. Real prices of existing single-family houses



NOTE: Series are deflated by the personal consumption expenditures price index.
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. Real business fixed investment



NOTE: Business fixed investment is known as "private nonresidential fixed investment" in the national income and product accounts. The data are quarterly.
SOURCE: Bureau of Economic Analysis via Haver Analytics.

accommodative since the start of the year and continued to be supported by historically low interest rates. The gross issuance of nonfinancial corporate bonds continued to be solid during the first part of year and was particularly strong in March for investment-grade firms (figure 22). Corporate bond yields have remained at historically low levels, and corporate bond spreads have narrowed to very low levels, supported in part by signs of improvement in the credit quality of nonfinancial firms.

In contrast, net bank lending to businesses has been subdued so far this year. For commercial and industrial loans, increasing new loan originations have been obscured to some degree by balance reductions due to forgiveness of loans under the Paycheck Protection Program (PPP). Commercial real estate loans have remained little changed, held down in part by weak growth in construction and land development loans amid tighter credit standards earlier in the year.

For small businesses, privately financed lending has climbed smartly since the turn of the year, as the PPP has increased access to credit. Outside of the PPP, credit availability for small businesses remains fairly tight, demand for such credit is weak, and default risk is still elevated. Small business loan performance has improved, and the share of small businesses expecting to require additional financial assistance has moved down, though hotels and restaurants report ongoing stress.

Exports have partly recovered as imports have continued to increase

U.S. exports have moved higher in recent months but still remain below pre-pandemic levels (figure 23). Despite the robust recovery for goods exports, the overall contribution to GDP from exports has been held down by the continuing depressed level of service exports given ongoing restraint in international travel. In contrast to the relatively modest recovery of exports, imports have soared since

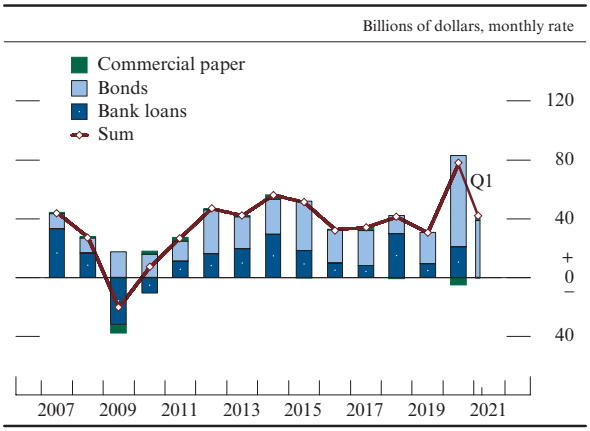
last summer, boosted by strong demand for both immediate consumption and rebuilding inventories. High levels of imports have strained the ability of the international logistics channel to deliver goods to U.S. customers in a timely fashion. Given the recent strength of imports relative to the milder recovery in exports, both the nominal trade deficit and current account deficit, relative to GDP, widened since 2019 (figure 24).

Federal fiscal actions provided substantial support to economic activity while also significantly raising the budget deficit

Federal fiscal policies enacted in response to the pandemic, most recently the American Rescue Plan, continue to fuel the economic recovery now under way. Stimulus checks have boosted most household incomes, and supplemental unemployment insurance has supported households affected by job loss. Increased grants-in-aid to state and local governments and business programs have supported aggregate demand as well. The Congressional Budget Office estimates that pandemic-related fiscal policies enacted to date will increase federal expenditures or reduce federal revenues by over $5 trillion over 10 years, with much of the effect on the deficit occurring in fiscal years 2020 and 2021.[5] These discretionary fiscal measures, combined with the automatic stabilizers—the reduction in tax receipts and increase in transfers that occur as a consequence of depressed economic activity—caused the federal deficit to surge to 15 percent of nominal GDP in fiscal 2020

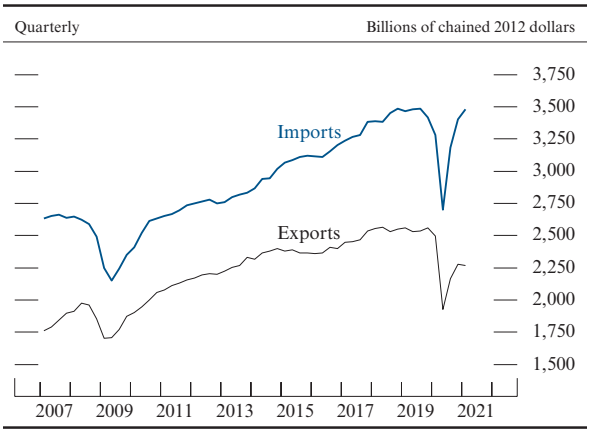
5. For more information, see Congressional Budget Office (2020), *The Effects of Pandemic-Related Legislation on Output* (Washington: CBO, September), https://www.cbo.gov/publication/56537; Congressional Budget Office (2020), "Summary Estimate for Divisions M through FF; H.R. 133, Consolidated Appropriations Act, 2021," January 14, https://www.cbo.gov/system/files/2021-01/PL_116-260_Summary.pdf; and Congressional Budget Office (2021), "Estimated Budgetary Effects of H.R. 1319, American Rescue Plan Act of 2021," March 10, https://www.cbo.gov/publication/57056.

22. Selected components of net debt financing for nonfinancial businesses



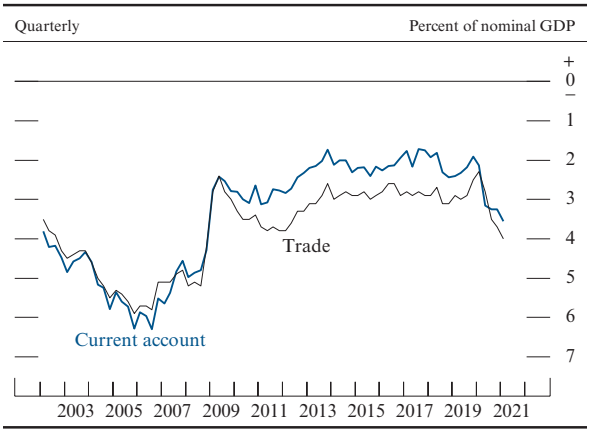
Source: Mergent Inc., Fixed Income Securities Database; S&P Global, Leveraged Commentary & Data; DTCC Solutions LLC, an affiliate of the Depository Trust & Clearing Corporation. This publication includes data licensed from DTCC Solutions LLC, an affiliate of the Depository Trust & Clearing Corporation. (For the DTCC licensing disclaimer, see the note on the Contents page.)

23. Real imports and exports of goods and services



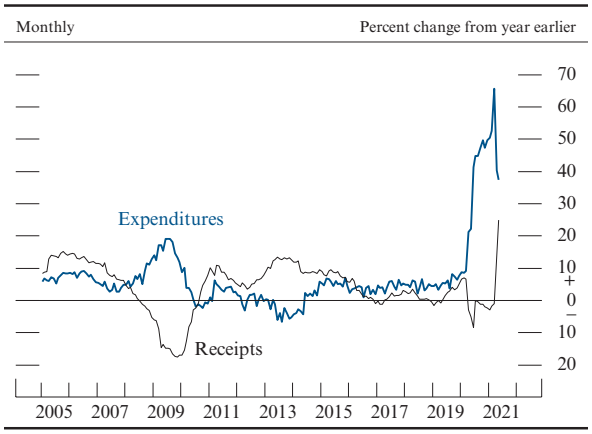
Source: Bureau of Economic Analysis via Haver Analytics.

24. U.S. trade and current account balances



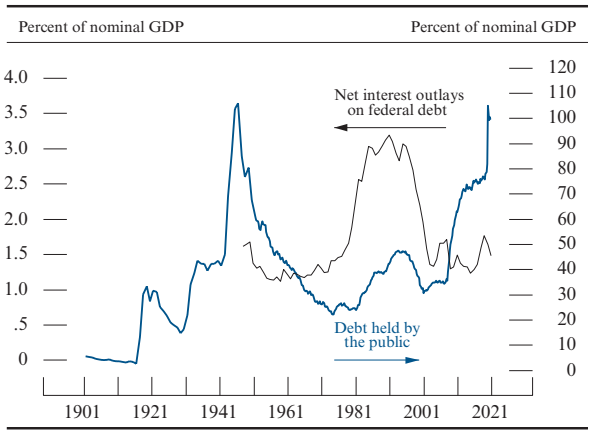
Note: GDP is gross domestic product.
Source: Bureau of Economic Analysis via Haver Analytics.

25. Federal receipts and expenditures



NOTE: The data are 12-month moving sums.
SOURCE: Office of Management and Budget via Haver Analytics.

26. Federal government debt and net interest outlays



NOTE: The data for net interest outlays are annual, begin in 1948, and extend through 2021. Net interest outlays are the cost of servicing the debt held by the public. 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. The data for federal debt are annual from 1901 to 1951 and quarterly thereafter. GDP is gross domestic product.
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."

(figure 25). Federal debt held by the public jumped to around 100 percent of nominal GDP—the highest debt-to-GDP ratio since 1947—and is expected to rise further this fiscal year (figure 26).[6]

Challenges to state and local government financing have been mitigated by federal aid

The pandemic pushed down state and local government tax collections and induced additional COVID-related expenses. In response, federal policymakers provided a historic level of fiscal support to state and local governments, covering budget shortfalls in aggregate, although some governments continue to confront pandemic-related fiscal stress. Moreover, the drag on state tax receipts from the pandemic is abating, as revenues have moved up smartly so far this year (figure 27). Property tax receipts—the primary tax source for local governments—have increased steadily during the pandemic. State and local government payrolls, though, have only edged up from their lows at the onset of the pandemic, and they remain 5 percent below pre-pandemic levels, including notably lower education employment (figure 28). Finally, municipal bond market conditions continued to be generally accommodative this year. Issuance has been robust, as yields remained historically low and bond spreads relative to Treasury securities have declined moderately so far this year.

Financial Developments

The path of the federal funds rate expected to prevail over the next year remains near zero

Market-based measures of the path that the federal funds rate is expected to take over the

6. Even before accounting for the additional budget effects from the most recent fiscal policy, the American Rescue Plan, the CBO projected in February that the debt-to-GDP ratio would rise in 2021. See Congressional Budget Office (2021), *The Budget and Economic Outlook: 2021 to 2031* (Washington: CBO, February), https://www.cbo.gov/system/files/2021-02/56970-Outlook.pdf.

next few years remain below 0.25 percent until the fourth quarter of 2022, about two quarters earlier than in February (figure 29).[7] The shift in the path followed news of the rapid deployment in the United States of highly effective COVID-19 vaccines, the reopening of contact-intensive sectors of the economy, and expectations that further support for aggregate demand would be coming from fiscal policy.

Survey-based measures of the expected path of the policy rate shifted up somewhat since the start of the year. According to the results of two surveys that the Federal Reserve Bank of New York conducted in June—the Survey of Primary Dealers and the Survey of Market Participants—the median respondent of each survey views the most likely path of the federal funds rate as remaining in its current range of 0 to ¼ percent until the third quarter of 2023, a quarter earlier than in March.[8]

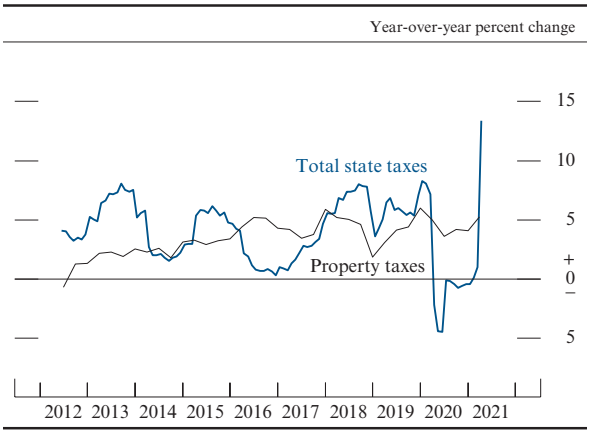
Longer-term nominal Treasury yields were little changed . . .

Yields on nominal Treasury securities at longer maturities were little changed, on net, since mid-February (figure 30). Concurrently, near-term uncertainty about longer-term interest rates—as measured by volatility of near-term swap options (swaptions) on 10-year swap interest rates—remained roughly unchanged, on net, since February.

. . . while spreads of other long-term debt to Treasury securities narrowed modestly on net

Across different categories of corporate credit, bond yields are little changed since mid-February and have remained near the lowest levels of their historical distributions. Spreads

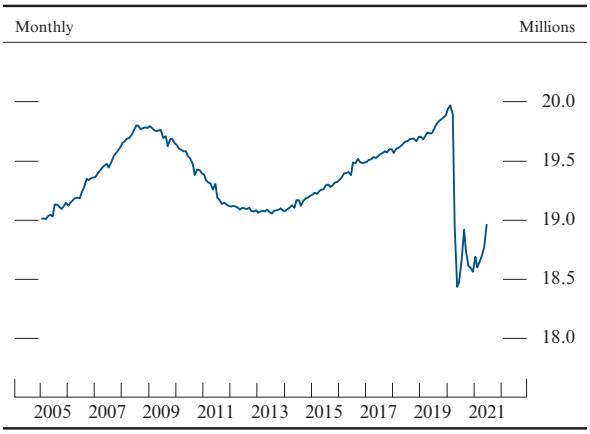
27. State and local tax receipts



NOTE: State tax data are year-over-year percent changes of 12-month moving averages, begin in June 2012, extend through April 2021, and are aggregated over all states except Wyoming, for which data are not available. Revenues from Washington, DC, are also excluded. Data for March and April are missing for New Mexico, as this state has longer reporting lags than others. Property tax data are year-over-year percent changes of 4-quarter moving averages, begin in 2012:Q2, and are primarily collected by local governments.

SOURCE: State Tax and Economic Review, State and Local Finance Initiative at Urban Institute; Census Bureau.

28. State and local government payroll employment



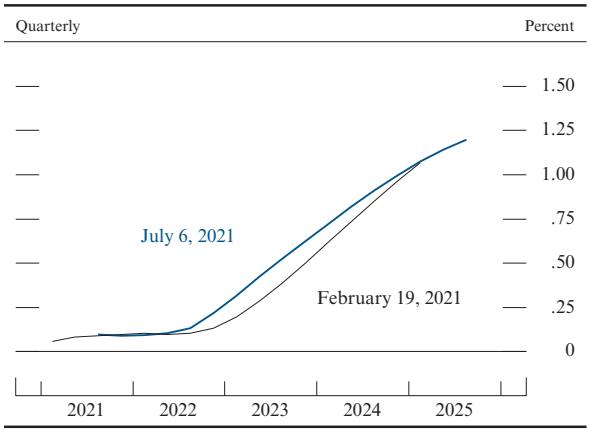
NOTE: The data are seasonally adjusted and extend through June 2021.

SOURCE: Bureau of Labor Statistics, National Compensation Survey via Haver Analytics.

7. These measures are based on a straight read of market quotes and are not adjusted for term premiums.

8. 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.

29. Market-implied federal funds rate path

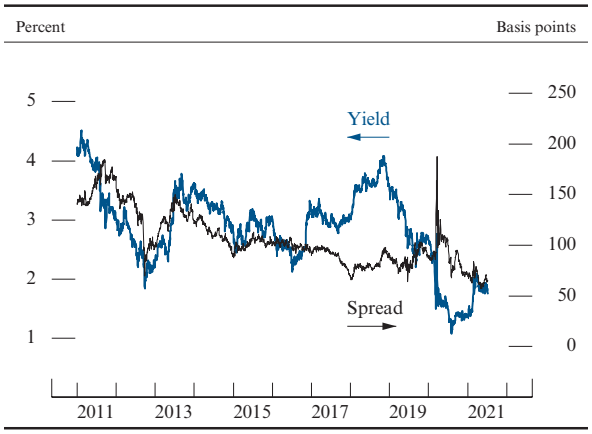


NOTE: The federal funds rate path is implied by quotes on overnight index swaps—a derivative contract tied to the effective federal funds rate. The implied path as of February 19, 2021, is compared with that as of July 6, 2021. The path is estimated with a spline approach, assuming a term premium of 0 basis points. The February 19, 2021, path extends through 2025:Q1 and the July 6, 2021, path through 2025:Q3.
SOURCE: Bloomberg; Federal Reserve Board staff estimates.

30. Yields on nominal Treasury securities

SOURCE: Department of the Treasury via Haver Analytics.

31. 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-year and 10-year nominal Treasury yields.
SOURCE: Department of the Treasury; J.P. Morgan. Courtesy of J.P. Morgan Chase & Co., Copyright 2021.

of corporate bond yields over comparable-maturity Treasury securities have narrowed modestly and stand somewhat below the levels prevailing at the onset of the pandemic, supported in part by signs of improvement in the credit quality of nonfinancial firms.

Since mid-February, yields on 30-year agency mortgage-backed securities—an important factor entering into the pricing of home mortgages—were little changed, on net, while those on comparable-maturity Treasury securities increased a bit, leaving their spread modestly lower on net (figure 31). Municipal bond spreads over rates on longer-term Treasury securities have declined moderately across credit categories since mid-February and stand at the lower end of the historical distribution, while municipal bond yields across credit categories are at about their all-time lowest historical levels.

Broad equity price indexes increased moderately

Broad stock price indexes have continued to rise since mid-February, as strong corporate earnings, optimism about the pace of vaccinations, additional fiscal stimulus, and signs of a faster pace of economic recovery outweighed concerns about high valuations, higher inflation, and prospects for the control of the virus abroad (figure 32). Prices of cyclical stocks, including those associated with companies in the basic materials, energy, and industrial sectors, outperformed broad equity price indexes. Banks' stock prices have also risen notably, on net, as the improved economic outlook and banks' reports of strong first-quarter earnings provided a further boost to investor optimism regarding the banking sector. Measures of realized and option-implied stock price volatility for the S&P 500 index—the 20-day realized volatility and the VIX, respectively—have declined somewhat and are near their historical medians (figure 33). (For a discussion of financial stability issues, see the box "Developments Related to Financial Stability.")

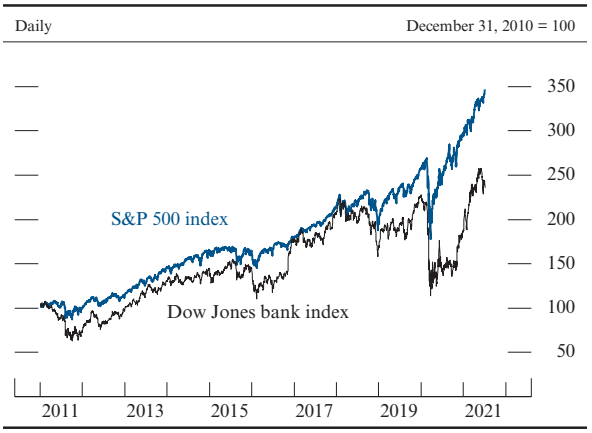
Markets for Treasury securities, mortgage-backed securities, and corporate and municipal bonds have functioned well . . .

Measures of market liquidity for Treasury securities—such as measures of market depth and bid-ask spreads—remained close to pre-pandemic levels overall, particularly for shorter-dated securities. However, longer-dated Treasury securities and some portions of the mortgage-backed securities market—notably those classes of securities excluded from Federal Reserve open market purchases—remain somewhat less liquid than before the onset of the pandemic. Measures of market functioning in the corporate and municipal bond markets remained stable since February, with these markets functioning roughly as they did in the months before the pandemic. Bid-ask spreads across corporate bond credit categories have been slightly below pre-pandemic levels, and issuance of corporate bonds in primary markets has been solid. Municipal bond market liquidity—as measured by round-trip transaction costs—has come back to near pre-pandemic levels.

. . . while short-term funding market conditions remained stable

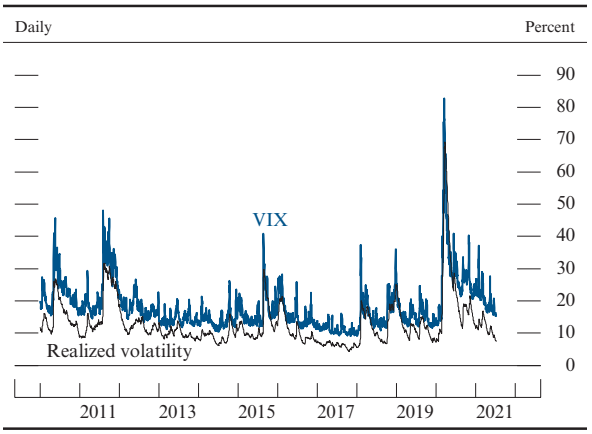
The effective federal funds rate (EFFR) and other overnight unsecured rates have seen some slight downward pressure relative to the interest rate on excess reserves since mid-February. The EFFR has nevertheless been comparatively stable, while other short-term interest rates registered more sizable declines. Secured overnight rates traded lower, with the Secured Overnight Financing Rate trading at or just above the offering rate on the overnight reverse repurchase agreement (ON RRP) facility since mid-March. Ample liquidity, arising from substantial increases in reserves, has, in conjunction with paydowns of Treasury bills, driven short-term interest rates lower. Notwithstanding the very low level of rates—including small volumes of negative-rate trading in overnight repurchase agreements on most days between mid-March

32. Equity prices



SOURCE: S&P Dow Jones Indices LLC via Bloomberg. (For Dow Jones Indices licensing information, see the note on the Contents page.)

33. 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, 5-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®) via Bloomberg; Federal Reserve Board staff estimates.

Developments Related to Financial Stability

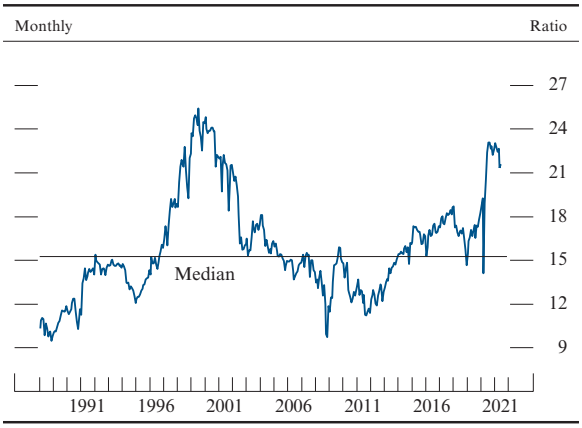
While some financial vulnerabilities have increased since February, the institutions at the core of the financial system remain resilient. This discussion reviews vulnerabilities in the U.S. financial system. The framework used by the Federal Reserve Board for assessing the resilience of the U.S. financial system focuses on financial vulnerabilities in four broad areas: asset valuations, business and household debt, leverage in the financial sector, and funding risks.

Prices of risky assets have generally increased in the first half of 2021. They have been buoyed by the rapid deployment of highly effective COVID-19 vaccines in the United States, the support provided by fiscal policy, and increased investor risk appetite. Broad equity market indexes have reached record highs in recent months, and the ratio of prices to forecasts of earnings remains high relative to its historical distribution (figure A). Option-implied volatility has been declining throughout the first half of 2021 and now stands at about its historical median. Yields on corporate bonds and leveraged loans remain low. On balance, indicators of commercial real estate (CRE) valuations remain high; however, low transaction volumes—especially for distressed properties—may mask declines in commercial property values. Supported by relatively low mortgage rates and shifting supply and demand dynamics brought about by the pandemic, house prices have increased at double-digit annual rates for several months amid strong home sales. The surge in the prices of a variety of crypto-assets also reflects in part increased risk appetite. Long-term Treasury yields have risen since mid-February but remain low by historical standards. The high asset prices in part reflect the continued low level of Treasury yields. However, valuations for some assets are elevated relative to historical norms even when using measures that account for Treasury yields (figure B). Asset prices may be vulnerable to significant declines should investor risk appetite fall, interest rates rise unexpectedly, or the recovery stall.

Vulnerabilities from both business and household debt have declined through the first quarter of 2021, reflecting a slower pace of business borrowing, an improvement in business earnings, and government programs that have supported business and household incomes. Even so, some businesses and households remain under considerable strain. Business debt outstanding changed little in the second half of 2020 and first quarter of 2021, although it remains high relative to gross domestic product (figure C). Recovering earnings and the low level of interest rates have generally aided businesses' ability to carry debt. Some smaller businesses continue to face significant financial strains but have been supported by government

(continued)

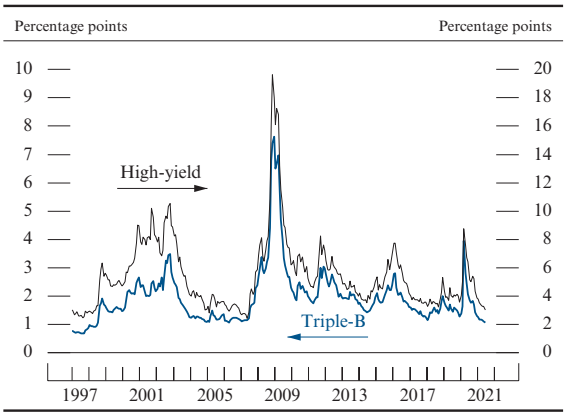
A. Forward price-to-earnings ratio of S&P 500 firms



NOTE: The data extend through June 2021. The series represents the aggregate forward price-to-earnings ratio of S&P 500 firms based on expected earnings for 12 months ahead.

SOURCE: Federal Reserve Board staff calculations using Refinitiv (formerly Thomson Reuters); Institutional Brokers' Estimate System estimates.

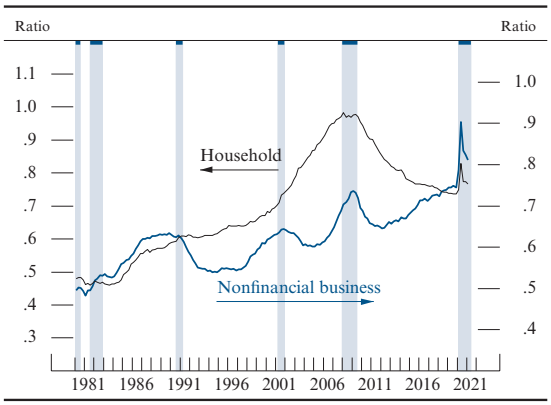
B. Corporate bond spreads to similar-maturity Treasury securities



NOTE: The data are monthly and extend through June 2021. The triple-B series reflects the effective yield of the ICE Bank of America Merrill Lynch (BofAML) 7-to-10-year triple-B U.S. Corporate Index (C4A4), and the high-yield series reflects the effective yield of the ICE BofAML 7-to-10-year U.S. Cash Pay High Yield Index (J4A0). Treasury yields from the smoothed yield curve are estimated from off-the-run securities.

SOURCE: ICE Data Indices, LLC, used with permission; Department of the Treasury.

C. Nonfinancial business- and household-sector credit-to-GDP ratios



NOTE: The data are quarterly. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research (NBER). As of the publication of this report, the NBER has not declared an end to the current recession. GDP is gross domestic product.

SOURCE: Federal Reserve Board staff calculations based on Bureau of Economic Analysis, national income and product accounts, and Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States."

programs, including the Paycheck Protection Program (PPP). Debt owed by households remains at a moderate level relative to income. Household borrowing continues to be heavily concentrated among borrowers with high credit scores. Moreover, government actions taken in response to the pandemic have provided significant support to household balance sheets and incomes, with many households saving more and holding more liquid assets.

In the financial sector, leverage at banks and broker-dealers remained low, while leverage at hedge funds and life insurance companies continued to be high. The common equity Tier 1 ratio for most banks increased, on net, over 2020 and into the first quarter of 2021. Measures of credit quality of bank loans have also improved in the first quarter of 2021. Moreover, the share of loan balances in loss-mitigation programs at the largest banks has declined. The shares of credit cards and auto loans in loss mitigation have seen larger declines, while the shares of residential real estate, commercial and industrial, and CRE loans remain high. Nevertheless, some uncertainty remains about the ability of borrowers in loss-mitigation programs to meet their obligations after those programs end and government support runs out. Broker-dealer leverage remained near historically low levels through the first quarter of 2021, although dealers continue to finance sizable inventories of Treasury securities. No notable effect on Treasury market functioning followed the expiration in March 2021 of temporary changes to the supplementary leverage ratio, which were implemented to ease strains in Treasury market intermediation in the initial weeks of the pandemic. Most measures of hedge fund leverage increased in the second half of 2020 into the beginning of 2021 and are now above their historical averages. A few recent episodes have highlighted the opacity of risky exposures and the need for greater transparency at hedge funds and other leveraged financial entities that can transmit stress to the financial system. The Financial Stability Oversight Council has restarted its Hedge Fund Working Group to improve data sharing, identify risks, and strengthen the financial system. Leverage at life insurance companies remains historically high as of the first quarter of 2021. Issuance volumes of non-agency securities recovered somewhat in the first quarter of 2021, although the recovery was uneven across asset classes.[1] Collateralized loan obligation and asset-backed securities issuance was elevated, whereas non-agency commercial mortgage-backed securities issuance was weak.

Funding risks at domestic banks remained low, as these banks rely only modestly on short-term wholesale funding and maintain sizable holdings of high-quality liquid assets. Liquidity ratios were well above regulatory requirements at most large domestic banks as of the first quarter of 2021. Assets under management at prime and tax-exempt money market funds (MMFs) have declined since the middle of 2020, but vulnerabilities at these funds remain and call for structural fixes.

The President's Working Group on Financial Markets released a report in December 2020 outlining potential reforms to address risks from the MMF sector.[2] Subsequently, the Securities and Exchange Commission issued a request for comment on these potential reforms and summarized its findings.[3] If

(continued on next page)

1. Securitization can add leverage to the financial system through its use of "special purpose entities," which are generally subject to rules such as risk retention that are less stringent than banks' regulatory capital requirements.

2. See U.S. Department of the Treasury (2020), "President's Working Group on Financial Markets Releases Report on Money Market Funds," press release, December 22, https://home.treasury.gov/news/press-releases/sm1219.

3. See U.S. Securities and Exchange Commission (2021), "SEC Requests Comment on Potential Money Market Fund Reform Options Highlighted in President's Working Group

Developments Related to Financial Stability *(continued)*

properly calibrated, some of these reforms—such as swing pricing, a minimum balance at risk, and capital buffers—could significantly reduce the run risk associated with MMFs. Meanwhile, the Money Market Mutual Fund Liquidity Facility and the Commercial Paper Funding Facility, which were deployed during the COVID-19 pandemic to backstop short-term funding markets, expired at the end of March with no material effect on these markets. Bond and bank loan mutual funds benefited from net inflows but are exposed to risks due to large holdings of illiquid assets.

A routine survey of market contacts on salient shocks to financial stability highlights several important risks. A worsening of the global pandemic could stress the financial systems in emerging markets and some European countries. Further, if global interest rates were to rise abruptly, some emerging market economies could experience additional fiscal strains. These risks, if realized, could interact with financial vulnerabilities and pose additional risks to the U.S. financial system.

Developments Associated with Facilities to Support the Economy during the COVID-19 Crisis

In the immediate wake of the pandemic, the Federal Reserve took forceful actions and established emergency lending facilities, with the approval of the Secretary of the Treasury as needed. These actions and facilities supported the flow of credit to households and businesses and served as backstop measures that have given investors confidence that support would be available should conditions deteriorate substantially.

Most of the facilities established at the onset of the pandemic expired at the end of December 2020, the beginning of January 2021, or the end of March 2021. These facilities expired with no notable effect on financial market functioning.

The termination date of the Federal Reserve's Paycheck Protection Program Liquidity Facility, which currently has $90.6 billion in loans outstanding funded to the PPP, was extended to July 30, 2021. The Federal Reserve has begun winding down the portfolio of the Secondary Market Corporate Credit Facility, an emergency lending facility that closed on December 31, 2020.[4] The portfolio sales have been gradual and orderly and have aimed to minimize the potential for any adverse effect on market functioning by taking into account daily liquidity and trading conditions for exchange-traded funds and corporate bonds. To date, these sales have had no notable effect on mutual fund flows or price effects in the market.

The Federal Reserve also took actions to reduce spillovers to the U.S. economy from foreign financial stresses. Temporary U.S. dollar liquidity swap lines were established in March 2020, in addition to the preexisting standing lines, and have improved liquidity conditions in dollar funding markets in the United States and abroad by providing foreign central banks with the capacity to deliver U.S. dollar funding to institutions in their jurisdictions during times of market stress. The FIMA (Foreign and International Monetary Authorities) Repo Facility has helped support the smooth functioning of the U.S. Treasury market by providing a temporary source of U.S. dollars to a broad range of countries, many of which do not have swap line arrangements with the Federal Reserve. The Federal Reserve recently announced the extension of its temporary swap lines through December 31, 2021, which should help sustain improvements in global U.S. dollar funding markets.

Report," press release, February 4, https://www.sec.gov/news/press-release/2021-25.

4. See Board of Governors of the Federal Reserve System (2021), "Federal Reserve Board Announces Plans to Begin Winding Down the Portfolio of the Secondary Market Corporate Credit Facility," press release, June 2, https://www.federalreserve.gov/newsevents/pressreleases/monetary20210602a.htm.

and mid-June—short-term funding markets have functioned smoothly since February.

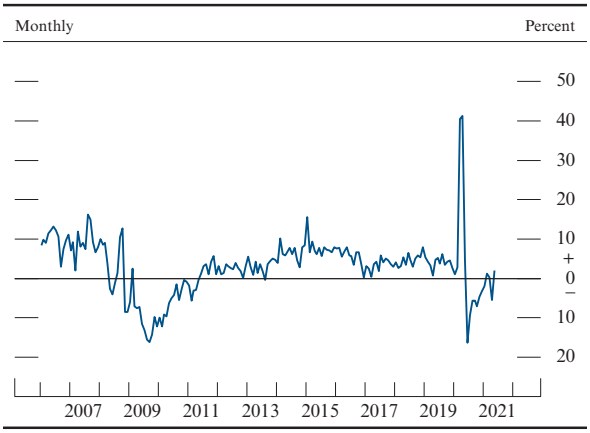
Money market funds increased significantly their holdings of overnight repurchase agreements

Since February, assets under management of government money market funds (MMFs) have gradually increased to an all-time high of nearly $4 trillion amid the disbursement of fiscal relief payments to individuals, states, and municipalities, and as some banks have reportedly taken steps to discourage additional deposit inflows. Against the backdrop of a sizable decrease in outstanding Treasury bill supply, government MMFs reduced their holdings of Treasury and agency securities while increasing their holdings of overnight repurchase agreements, including with the Federal Reserve. This development led to record levels of usage of the Federal Reserve's ON RRP facility in late May and June. (See the box "Developments in the Federal Reserve's Balance Sheet and Money Markets" in Part 2.)

Bank credit remained little changed, while lending standards eased

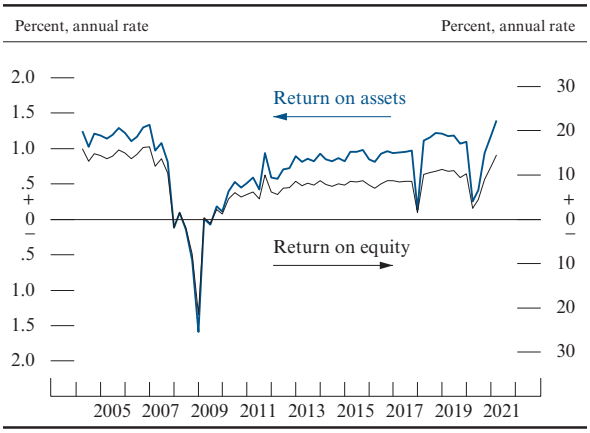
Total loans and leases outstanding at commercial banks remained little changed in the first half of the year (figure 34). The April Senior Loan Officer Opinion Survey on Bank Lending Practices, conducted by the Federal Reserve, reported easier standards for most business and household loans over the first quarter of the year. Bank profitability increased over the first quarter of 2021 (figure 35). Delinquency rates on bank loans remain low but may increase later in the year, as foreclosure moratoriums and payment forbearance programs are set to expire.

34. Growth in total loans and leases



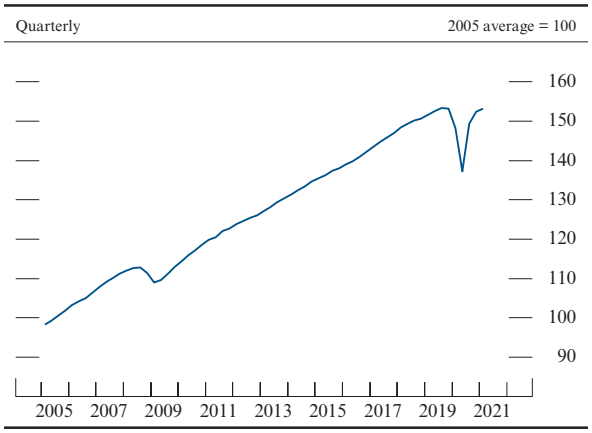
NOTE: The data are calculated as monthly annualized growth rates and are seasonally and break adjusted.
SOURCE: Federal Reserve Board, Statistical Release H.8, "Assets and Liabilities of Commercial Banks in the United States."

35. Profitability of bank holding companies



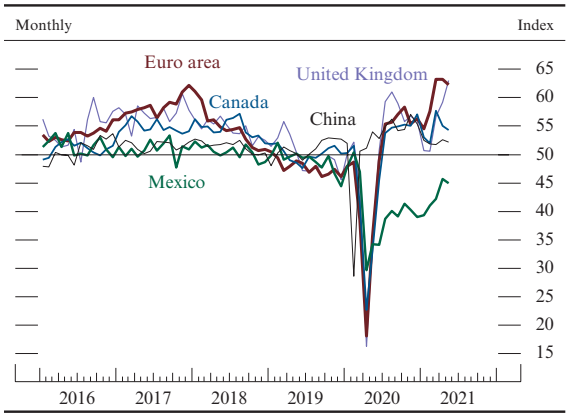
NOTE: The data are quarterly and are seasonally adjusted.
SOURCE: Federal Reserve Board, Form FR Y-9C, Consolidated Financial Statements for Bank Holding Companies.

36. Foreign real gross domestic product



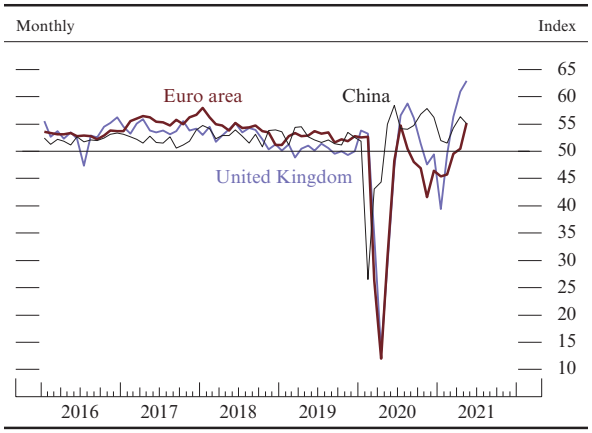
NOTE: Foreign gross domestic product is computed on a representative sample of 40 countries and aggregated using U.S. trade weights.
SOURCE: Federal Reserve Bank of Dallas, Database of Global Economic Indicators, "Real Gross Domestic Product."

37. Manufacturing output purchasing managers index in selected foreign economies



NOTE: For the foreign manufacturing output purchasing managers index (PMI), values greater than (less than) 50 indicate better (worse) business conditions, on average, for the participants surveyed relative to conditions at the time of the previous survey.
SOURCE: IHS Markit, Global Sector PMI.

38. Services purchasing managers index in selected foreign economies



NOTE: For the foreign services output purchasing managers index (PMI), values greater than (less than) 50 indicate better (worse) business conditions, on average, for the participants surveyed relative to conditions at the time of the previous survey.
SOURCE: IHS Markit, Global Sector PMI.

International Developments

The recovery abroad slowed in the first half of the year . . .

A resurgence of COVID-19 cases late last year led to substantial tightening in social-distancing restrictions in many foreign economies. Consequently, foreign GDP growth slowed in the last quarter of 2020 and the first quarter of 2021, as several advanced foreign economies (AFEs) experienced contractions in activity (figure 36). In most AFEs, the level of GDP in the first quarter remained below its pre-pandemic peak. However, compared with last spring, many foreign economies exhibited greater resilience to public health restrictions, and their governments have continued to provide fiscal support. Recent available indicators suggest a pickup for AFEs in GDP growth in the second quarter of this year as vaccination rates increased and restrictions were eased (figures 37 and 38).

Although the situation in the AFEs appears to be improving, conditions in emerging market economies (EMEs) are more mixed, partly reflecting differences in success in containing COVID-19 outbreaks. Also, the pace of vaccinations in many EMEs remains slow due to supply shortages and other logistical challenges. Some higher-income Asian economies, where infections have so far remained mostly under control, experienced surprisingly fast growth, boosted by increased export demand and a partial recovery in domestic consumption. Most notably, the levels of GDP in China and in other industrialized EMEs such as Taiwan—which had managed to remain fairly insulated from the virus but has seen outbreaks recently—are already roughly 8 percent above their pre-pandemic levels (figure 39). Conversely, in many Latin American countries and some South and Southeast Asian economies, infection outbreaks led to continuing or increased public health restrictions and social distancing. Reflecting these headwinds, recent economic indicators suggest a decline in

growth in the second quarter of 2021 in many of these EMEs following a sharp rebound in the first quarter, with economic activity still well below pre-pandemic levels.

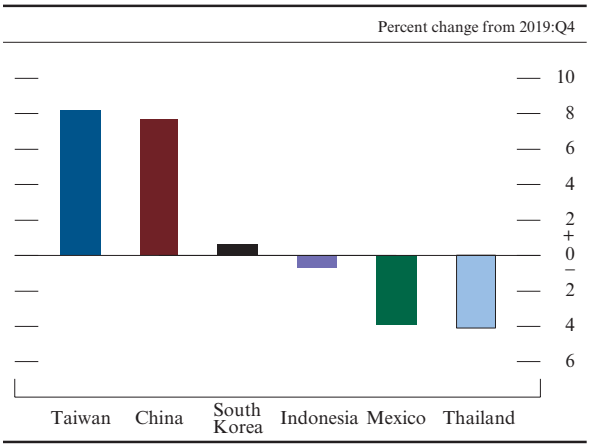
Unemployment rates in Europe are about 1 percentage point higher in early 2021 than before the pandemic (figure 40). This relatively muted change is partly a result of wage subsidy programs that kept workers on payrolls and employment protection regulations that limited rapid job destruction. Hours worked, however, have fallen more substantially, suggesting that the extent of economic slack in Europe may be greater than indicated by the unemployment rate. The unemployment trajectory in Canada was more similar to that in the United States, with a rapid increase early last spring followed by a steep decline subsequently.

. . . amid a pickup in inflation and continued policy support

Inflation rates abroad have increased in recent months. In many AFEs, inflation readings moved up since the beginning of the year after substantial declines last year (figure 41). The rise in inflation was largely driven by base effects due to low price levels in 2020 as well as run-ups in energy prices. In some EMEs, currency depreciation and higher food prices are also contributing to inflation pressures. Even so, core inflation readings in many AFEs still point to moderate underlying inflation pressure, suggesting that the observed rise in inflation so far this year largely reflects temporary factors.

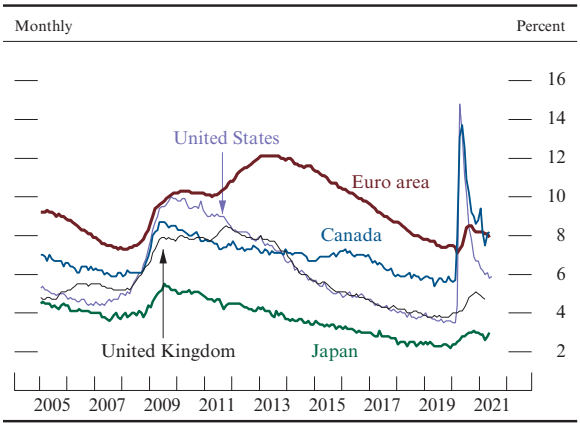
Monetary policy abroad remained accommodative, as central banks focused on supporting growth and viewed the recent rise in inflation as transitory. Market-implied policy paths in many AFEs continue to signal a period of monetary accommodation, although paths in Canada and the United Kingdom moved higher this year (figure 42). The European Central Bank increased its pace of asset purchases in the spring, and the Bank of Japan's yield curve control policy

39. Real gross domestic product in selected emerging market economies



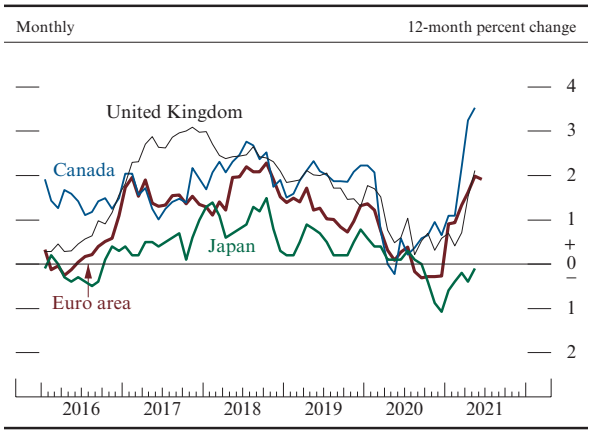
NOTE: The data are for 2021:Q1.
SOURCE: For Taiwan, Directorate General of Budget, Accounting and Statistics; for China, National Bureau of Statistics of China; for South Korea, Bank of Korea; for Indonesia, Badan Pusat Statistik; for Mexico, Instituto Nacional de Estadística y Geografía; for Thailand, Office of the National Economic and Social Development Board; all via Haver Analytics.

40. Unemployment rate in selected advanced economies



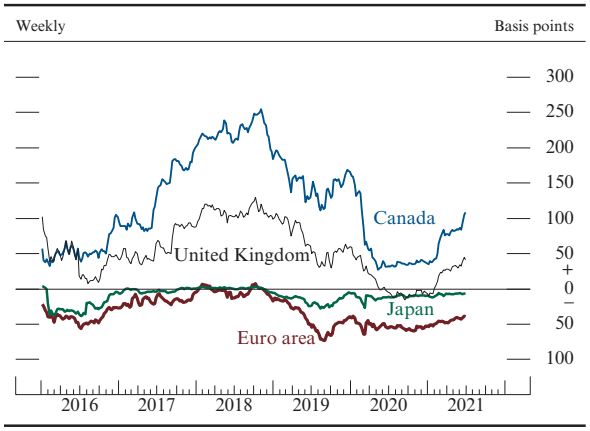
NOTE: The data for the United Kingdom extend through March 2021 and are centered 3-month averages of monthly data. The data for the United States extend through June 2021.
SOURCE: For the United Kingdom, Office for National Statistics; for Japan, Ministry of Health, Labour and Welfare; for the euro area, Statistical Office of the European Communities; for Canada, Statistics Canada; for the United States, Bureau of Labor Statistics; all via Haver Analytics.

41. Consumer price inflation in selected advanced foreign economies



NOTE: The data for the euro area incorporate the flash estimate for June 2021.
SOURCE: For the United Kingdom, Office for National Statistics; for Japan, Ministry of Internal Affairs and Communications; for the euro area, Statistical Office of the European Communities; for Canada, Statistics Canada; all via Haver Analytics.

42. 24-month policy expectations for selected advanced foreign economies



NOTE: The data are weekly averages of daily 24-month market-implied central bank policy rates. The 24-month policy rates are implied by quotes on overnight index swaps tied to the policy rates. The data extend through July 2, 2021.
SOURCE: Bloomberg; Federal Reserve Board staff estimations.

proved effective in containing a rise in bond yields. By contrast, while still maintaining an accommodative policy rate, the Bank of Canada announced plans to end liquidity support programs and started slowing its pace of asset purchases. The Bank of England also slowed its pace of asset purchases but indicated that its policy stance remains accommodative. Monetary policy in EMEs was generally accommodative as well, but some EME central banks—including in Brazil, Russia, and Turkey—increased policy rates, citing concerns about inflationary pressures. The Bank of Mexico, while leaving its policy rate unchanged, highlighted concerns about financial market volatility and past peso depreciation.

Improved outlook led to increases in foreign yields and equity prices . . .

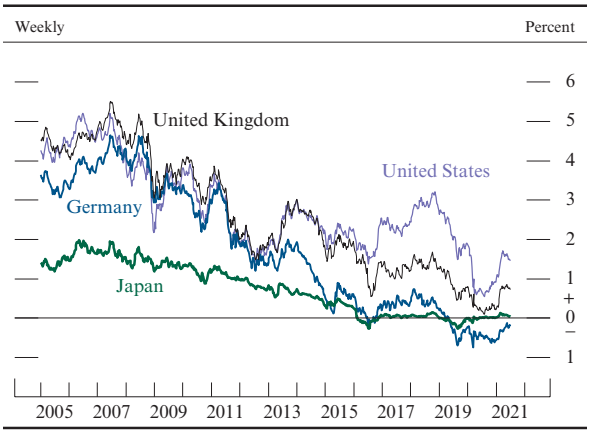
Longer-term sovereign yields and market-based inflation compensation measures increased in some major advanced economies, as the economic outlook brightened and commodity prices rose (figure 43). Despite the increase, market-based inflation compensation in many AFEs remained below the inflation target of their respective central banks. Japanese yields were little changed due to the Bank of Japan's yield curve control policy. Equity markets in AFEs generally rose despite the new wave of COVID-19 infections earlier this year, as many economies proved resilient to increased case numbers and lockdowns and the vaccine rollout allowed gradual reopening (figure 44).

Equities in emerging markets were mixed. Since the beginning of the year, equity prices in some EMEs, including South Korea, Taiwan, and Mexico, improved considerably, but equity prices in other countries, including China, underperformed (figure 45). Inflows into dedicated EME investment funds slowed this year but remained positive, and EME bond spreads moved little so far this year (figure 46).

. . . and the dollar remained little changed

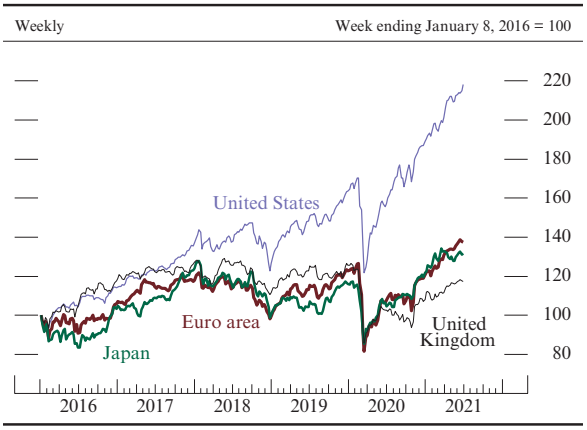
After depreciating sharply in late 2020, the broad dollar index—a measure of the trade-weighted value of the dollar against foreign currencies—has changed little, on net, since the beginning of the year. It has strengthened somewhat recently, amid increases in medium-term U.S. yields (figure 47). Among AFE currencies, the dollar appreciated most against the Japanese yen, as Japanese yields moved least. Since the beginning of the year, the U.S. dollar depreciated against the Canadian dollar, which was buoyed by higher commodity prices and signs of a stronger-than-expected recovery in Canada (figure 48).

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



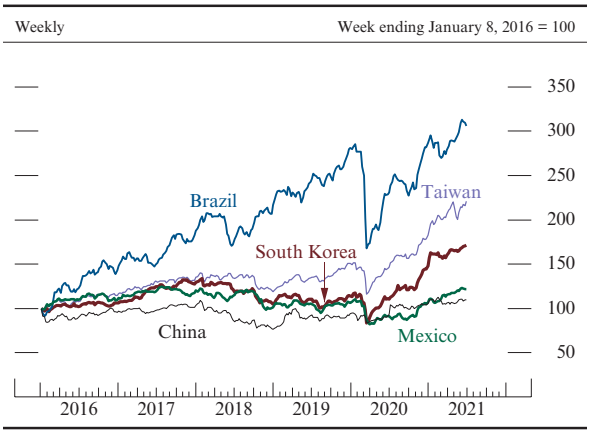
NOTE: The data are weekly averages of daily benchmark yields and extend through July 2, 2021.
SOURCE: Bloomberg.

44. Equity indexes for selected advanced economies



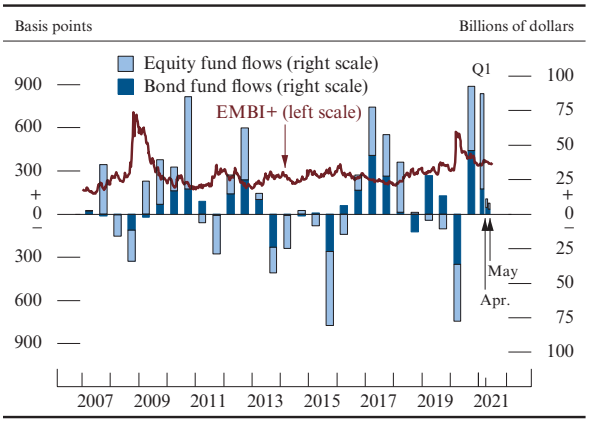
NOTE: The data are weekly averages of daily data and extend through July 2, 2021.
SOURCE: For euro area, Dow Jones Euro Stoxx Index; for Japan, Tokyo Stock Price Index; for United Kingdom, Financial Times Stock Exchange 100 Index; for United States, S&P 500 Index; all via Bloomberg. (For Dow Jones Indices licensing information, see the note on the Contents page.)

45. Equity indexes for selected emerging market economies



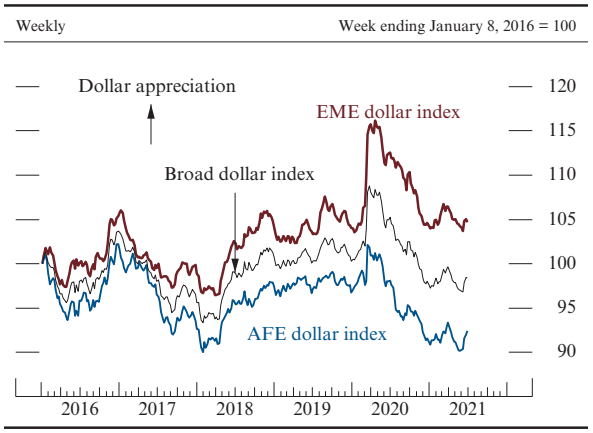
NOTE: The data are weekly averages of daily data and extend through July 2, 2021.
SOURCE: For China, Shanghai Composite Index; for Brazil, Bovespa Index; for South Korea, Korean Composite Index; for Mexico, IPC Index; for Taiwan, TAIEX; all via Bloomberg.

46. Emerging market mutual fund flows and spreads



NOTE: The bond and equity fund flows data are semiannual sums of weekly data from December 28, 2006, to December 30, 2020; a quarterly sum of weekly data from December 31, 2020, to March 31, 2021; and monthly sums of weekly data from April 1, 2021, to May 26, 2021. Weekly data span Thursday through Wednesday, and the semiannual, quarterly, and monthly values are sums over weekly data for weeks ending in that half year, quarter, or month. 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 and extend through July 2, 2021. The EMBI+ data exclude Venezuela.
SOURCE: For bond and equity fund flows, EPFR Global; for EMBI+, J.P. Morgan Emerging Markets Bond Index Plus via Bloomberg.

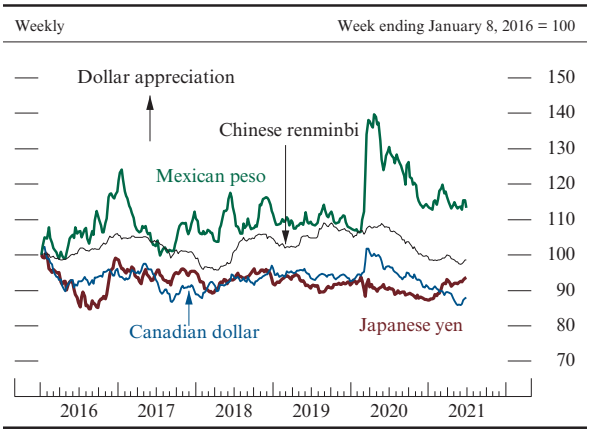
47. U.S. dollar exchange rate indexes



NOTE: The data, which are in foreign currency units per dollar, are weekly averages of daily values of the broad dollar index, advanced foreign economies (AFE) dollar index, and emerging market economies (EME) dollar index. The weekly data extend through July 2, 2021. As indicated by the leftmost arrow, increases in the data reflect U.S. dollar appreciation and decreases reflect U.S. dollar depreciation.

SOURCE: Federal Reserve Board, Statistical Release H.10, "Foreign Exchange Rates."

48. Exchange rate indexes for selected economies



NOTE: The data, which are in foreign currency units per dollar, are weekly averages of daily data and extend through July 2, 2021. As indicated by the leftmost arrow, increases in the data reflect U.S. dollar appreciation and decreases reflect U.S. dollar depreciation.

SOURCE: Federal Reserve Board, Statistical Release H.10, "Foreign Exchange Rates."

Part 2
Monetary Policy

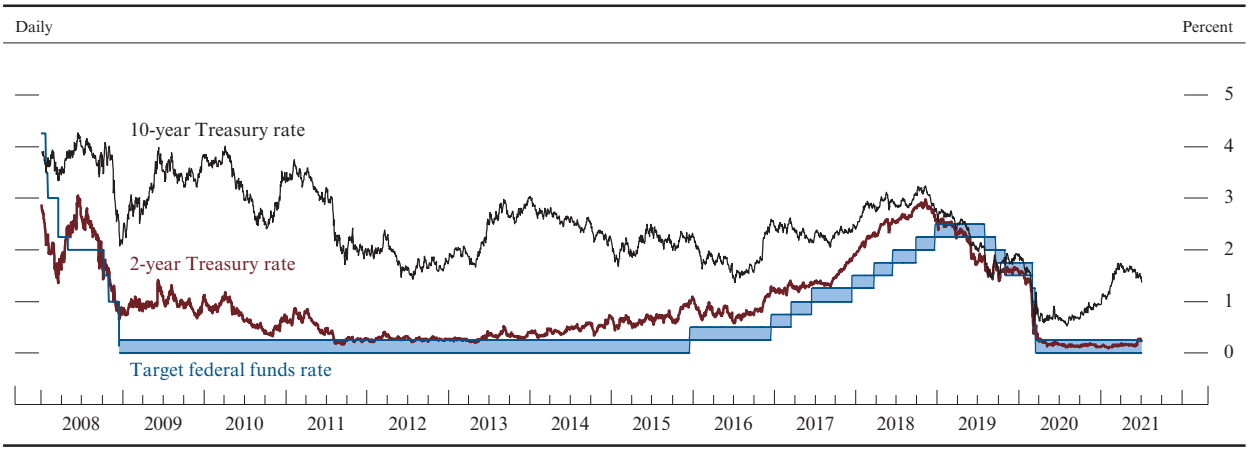
The Federal Open Market Committee maintained the federal funds rate near zero as it seeks to achieve maximum employment and inflation at the rate of 2 percent over the longer run . . .

As part of its actions to ensure that monetary policy will continue to deliver powerful support to the economy until the recovery is complete, the Federal Open Market Committee (FOMC) has maintained the target range for the federal funds rate at 0 to ¼ percent (figure 49). The Committee has indicated that it expects it will be appropriate to maintain the target range for the federal funds rate at 0 to ¼ percent until labor market conditions have reached levels consistent with the Committee's assessments of maximum employment and inflation has risen to 2 percent and is on track to moderately exceed 2 percent for some time. With inflation having run persistently below the Committee's longer-run goal, the Committee will aim to achieve inflation moderately above 2 percent for some time so that inflation averages 2 percent over time and longer-term inflation expectations remain well anchored at 2 percent. The Committee expects to maintain an accommodative stance of monetary policy until these outcomes are achieved.

. . . and the Committee increased the holdings of Treasury securities and agency mortgage-backed securities in the System Open Market Account

In addition, the Federal Reserve has continued to expand its holdings of Treasury securities by $80 billion per month and its holdings of agency mortgage-backed securities (MBS) by $40 billion per month. These asset purchases help foster smooth market functioning and accommodative financial conditions, thereby supporting the flow of credit to households and businesses. The Committee's current guidance regarding asset purchases indicates that increases in the holdings of Treasury securities and agency MBS in the System Open Market Account will continue at least at this pace until substantial further progress has been made toward its maximum-employment and price-stability goals since the Committee

49. 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.

adopted its asset purchase guidance last December. In addition, the minutes of the June 2021 FOMC meeting noted the importance that policymakers attach to clear communications about the Committee's assessment of progress toward its longer-run goals and to providing these communications well in advance of the time when progress can be judged substantial enough to warrant a change in the pace of asset purchases.[9] In coming meetings, the FOMC will continue to assess the economy's progress toward the Committee's goals.

The FOMC is committed to using its full range of tools to promote maximum employment and price stability

Progress on vaccinations will likely continue to reduce the effects of the public health crisis on the economy, but risks to the economic outlook remain. The Federal Reserve is committed to using its full range of tools to support the U.S. economy in this challenging time, thereby promoting its maximum-employment and price-stability goals. The Committee will continue to monitor the implications of incoming information for the economic outlook and is prepared to adjust the stance of monetary policy as appropriate if risks emerge that could impede the attainment of the Committee's goals. The Committee's assessments will continue to take into account a wide range of information, including readings on public health, labor market conditions, inflation pressures and inflation expectations, and financial and international developments.

In addition to considering a wide range of economic and financial data and information gathered from business contacts and other informed parties around the country, policymakers routinely consult prescriptions for the policy interest rate provided by various monetary policy rules. These rule prescriptions can provide useful benchmarks for the FOMC. Simple rules cannot capture the complexities of monetary policy, and many practical considerations make it undesirable for the FOMC to adhere strictly to the prescriptions of any specific rule. However, some principles associated with good monetary policy can be illustrated by these policy rules (see the box "Monetary Policy Rules, the Effective Lower Bound, and the Economic Recovery"). 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.

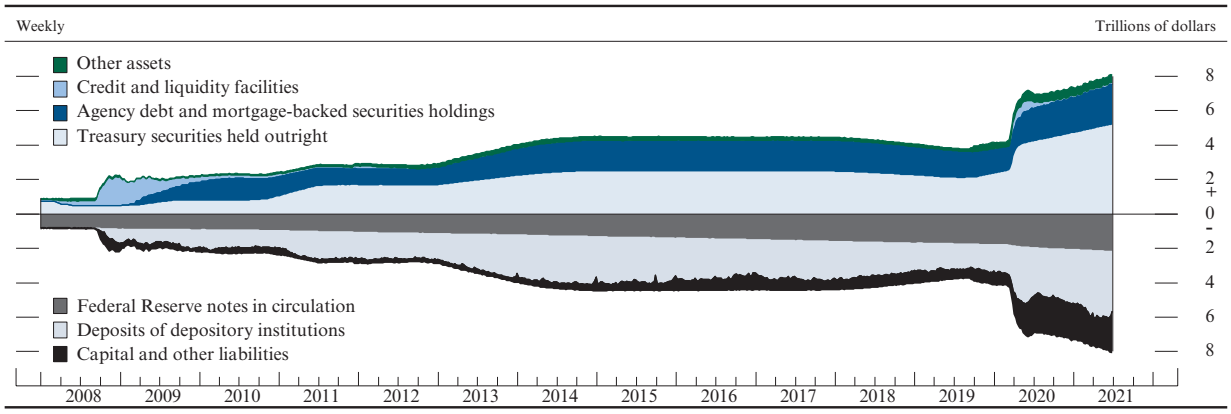
The size of the Federal Reserve's balance sheet continued to grow, reflecting purchases of U.S. Treasury securities and agency mortgage-backed securities

The Federal Reserve's balance sheet has grown to $8.1 trillion from $7.4 trillion at the end of January, reflecting continued asset purchases to help foster smooth market functioning and accommodative financial conditions, thereby supporting the flow of credit to households and businesses (figure 50). The Federal Reserve has continued rolling over at auction all principal payments from its holdings of Treasury securities. Principal payments received from agency MBS and agency debt continue to be reinvested into agency MBS. After the March FOMC meeting, in light of the sustained smooth functioning of markets for agency commercial mortgage-backed securities (CMBS), the Federal Reserve ended regular purchases of agency CMBS.

The increase in aggregate asset holdings on the Federal Reserve's balance sheet arising from Treasury security and agency MBS purchases has been offset in part by declines in several other asset categories. Outstanding balances at many of the Federal Reserve's emergency liquidity and credit facilities

9. The minutes for the June 2021 FOMC meeting are available on the Board's website at https://www.federalreserve.gov/monetarypolicy/fomccalendars.htm.

50. Federal Reserve assets and liabilities



NOTE: "Agency debt and mortgage-backed securities holdings" includes agency residential mortgage-backed securities and agency commercial mortgage-backed securities. "Credit and liquidity facilities" consists of primary, secondary, and seasonal credit; term auction credit; central bank liquidity swaps; support for Maiden Lane, Bear Stearns Companies, Inc., and AIG; and other credit and liquidity facilities, including the Primary Dealer Credit Facility, the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility, the Commercial Paper Funding Facility, the Term Asset-Backed Securities Loan Facility, the Primary and Secondary Market Corporate Credit Facilities, the Paycheck Protection Program Liquidity Facility, the Municipal Liquidity Facility, and the Main Street Lending Program. "Other assets" includes repurchase agreements, FIMA (Foreign and International Monetary Authorities) repurchase agreements, and 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 30, 2021. The key identifies shaded areas in order from top to bottom.

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

have declined since the end of January, and most facilities have now expired.[10] In June, the Federal Reserve Board announced plans to begin winding down the portfolio of the Secondary Market Corporate Credit Facility (SMCCF). The SMCCF proved very important in restoring market functioning last year, supporting the availability of credit for large employers, and bolstering employment through the COVID-19 pandemic. The winding down of the SMCCF portfolio has been gradual and orderly and has not produced any adverse effect on market functioning. Draws on central bank liquidity swap lines have decreased further to near zero, and usage of repurchase operations has remained at zero since February. In contrast, the Paycheck Protection Program Liquidity Facility has expanded to around $80 billion since the end of January.

Reserves have increased significantly to around $4 trillion, mostly because of asset purchases and the large drawdown in the Treasury General Account from around $1.6 trillion in January to about $850 billion in June. However, reserves have been relatively stable more recently given a substantial increase in the use of the overnight reverse repurchase agreement facility. (See the box "Developments in the Federal Reserve's Balance Sheet and Money Markets.")

10. A list of credit and liquidity facilities established by the Federal Reserve in response to COVID-19 is available on the Board's website at https://www.federalreserve.gov/funding-credit-liquidity-and-loan-facilities.htm.

Monetary Policy Rules, the Effective Lower Bound, and the Economic Recovery

Simple interest rate rules 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. Policymakers consult prescriptions of the policy interest rate derived from a variety of policy rules for guidance, without mechanically following the prescriptions of any particular rule. This discussion examines the prescriptions of a number of interest rate rules. One simplification these rules typically adopt is ignoring the effective lower bound (ELB) on interest rates, and many of the rules have prescribed negative values for the federal funds rate since the onset of the pandemic-driven recession.

Most rules analyzed in the research literature respond to deviations—both positive and negative—of resource utilization from its trend level because they were informed by historical periods and economic models in which high resource utilization is accompanied by inflation pressure. By contrast, the Federal Open Market Committee's (FOMC) Statement on Longer-Run Goals and Monetary Policy Strategy indicates that policymakers would not respond to high employment unless it was accompanied by signs of unwanted increases in inflation or the emergence of other risks that could impede the attainment of the Committee's goals.[1] Accordingly, this discussion examines—in addition to the prescriptions of a number of commonly studied monetary policy rules—the prescriptions of a modified simple rule that, all else being equal, does not mechanically call for policy rate increases as unemployment drops below its estimated longer-run level.[2]

Policy Rules: Some Key Design Principles and Limitations

In many stylized models of the economy, desirable economic outcomes can be achieved by following a monetary policy rule that incorporates key principles of good monetary policy. One such principle is that monetary policy should respond in a predictable way to changes in economic conditions, thus fostering public understanding of policymakers' goals and strategy. A second principle is that, to stabilize inflation, the policy rate should be adjusted over time in response to persistent increases or decreases in inflation to an extent sufficient to ensure a return of inflation to the central bank's longer-run objective.

Simple monetary policy rules also have important limitations. As noted earlier, simple rules do not typically recognize that the ELB limits the extent to which the policy rate can be lowered to support the economy, which may impart a downward bias to both employment and inflation. To mitigate the challenges posed by the ELB and anchor longer-term inflation expectations at 2 percent, the Committee indicates in its statement that it "seeks to achieve inflation that averages 2 percent over time, and therefore judges that, following periods when inflation has been running persistently below 2 percent, appropriate monetary policy will likely aim to achieve inflation moderately above 2 percent for some time."[3] None of the simple rules analyzed in this discussion include any mechanism to offset the downward bias in inflation imposed by the ELB. As such, they do not reflect these important aspects of the FOMC's monetary policy strategy.

(continued)

1. For a discussion of changes made to the statement, see the box "The FOMC's Revised Statement on Longer-Run Goals and Monetary Policy Strategy" in Board of Governors of the Federal Reserve System (2021), *Monetary Policy Report* (Washington: Board of Governors, February), pp. 40–41, https://www.federalreserve.gov/monetarypolicy/files/20210219_mprfullreport.pdf.

2. Other key features of the Committee's monetary policy strategy outlined in its statement, including the aim of having inflation average 2 percent over time to ensure that longer-term inflation expectations remain well anchored, are not incorporated in the simple rules analyzed in this discussion. For a description of the revised statement, see Jerome H. Powell (2020), "New Economic Challenges and the Fed's Monetary Policy Review," speech delivered at "Navigating the Decade Ahead: Implications for Monetary Policy," an economic policy symposium sponsored by the Federal Reserve Bank of Kansas City, held in Jackson Hole, Wyo. (via webcast), August 27, https://www.federalreserve.gov/newsevents/speech/powell20200827a.htm.

3. The statement recognizes the ELB as an important consideration in the conduct of monetary policy by indicating that "the federal funds rate is likely to be constrained by its effective lower bound more frequently than in the past." In part because of the proximity of interest rates to the ELB, the Committee judges that downward risks to employment and inflation have increased. The Committee is prepared to use its full range of tools to achieve its maximum-employment and price-stability goals.

Another limitation is that simple rules respond to only a small set of economic variables and thus necessarily abstract from many of the considerations that the FOMC takes into account. For example, a simple rule might respond to movements in a specific labor market indicator, such as the overall unemployment rate. However, no single labor market indicator can precisely capture the size of the shortfall from maximum employment or identify when a strong labor market can be sustained without putting undue upward pressure on inflation; many labor market indicators must be assessed.[4] Similarly, simple policy rules that systematically call for increases in the policy rate as slack in the labor market diminishes might fail to recognize the benefits of sustaining a strong labor market.[5]

Finally, simple rules for the policy rate do not explicitly recognize that the monetary policy toolkit includes other tools—notably, large-scale asset purchases and forward guidance, which are especially relevant when the policy rate is constrained by the ELB. (See the box "Developments in the Federal Reserve's Balance Sheet and Money Markets.")

Policy Rules: Descriptions

Economists have analyzed many monetary policy rules, including the well-known Taylor (1993) rule, the "balanced approach" rule, the "adjusted Taylor (1993)" rule, and the "first difference" rule.[6] In addition to these rules, figure A shows a "balanced approach (shortfalls)" rule, which represents one simple way to illustrate the Committee's focus on shortfalls from maximum employment. All of the policy rules analyzed in this discussion embody the key principles of good monetary policy previously noted as well as the important limitations.

All five rules feature the unemployment rate gap, measured as the difference between an estimate of the rate of unemployment in the longer run (u_t^{LR}) and the current unemployment rate; the first-difference rule includes the change in the unemployment rate gap rather than its level.[7] All of the rules abstract from the uncertainty that surrounds estimates of the unemployment rate gap. In addition, all of the rules include the difference between inflation and the FOMC's longer-run objective of 2 percent.[8] All but the

(continued on next page)

4. See Lael Brainard (2021), "How Should We Think about Full Employment in the Federal Reserve's Dual Mandate?" speech delivered at the Ec10, Principles of Economics, Lecture, Faculty of Arts and Sciences, Harvard University, Cambridge, Mass. (via webcast), February 24, https://www.federalreserve.gov/newsevents/speech/brainard20210224a.htm.

5. For examples of the benefits associated with strong labor market conditions, see *Fed Listens: Perspectives from the Public*, which summarizes the feedback received from the community as part of the FOMC's 2019–20 review of its monetary policy strategy, tools, and communication practices and is available on the Board's website at https://www.federalreserve.gov/publications/files/fedlistens-report-20200612.pdf.

6. 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. 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 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.

7. The original 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. Movements in these alternative measures of resource utilization are highly correlated. For more information, see the note below figure A.

8. None of these rules take into account historical inflation performance. As such, these rules do not incorporate the aim of achieving inflation that averages 2 percent over time as described in the FOMC's Statement on Longer-Run Goals and Monetary Policy Strategy. In particular, that statement indicates that "the Committee seeks to achieve inflation that averages 2 percent over time, and therefore judges that, following periods when inflation has been running persistently below 2 percent, appropriate monetary policy will likely aim to achieve inflation moderately above 2 percent for some time."

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	$R_t^{BA} = r_t^{LR} + \pi_t + 0.5(\pi_t - \pi^{LR}) + 2(u_t^{LR} - u_t)$
Balanced-approach (shortfalls) rule	$R_t^{SBA} = r_t^{LR} + \pi_t + 0.5(\pi_t - \pi^{LR}) + 2min\{(u_t^{LR} - u_t), 0\}$
Adjusted Taylor (1993) rule	$R_t^{T93\,adj} = max\{R_t^{T93} - Z_t, \text{ELB}\}$
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^{SBA}, R_t^{T93adj}, and R_t^{FD} represent the values of the nominal federal funds rate prescribed by the Taylor (1993), balanced-approach, balanced-approach (shortfalls), adjusted Taylor (1993), and first-difference rules, respectively.

R_t denotes the realized nominal federal funds rate for quarter t, π_t is the 4-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 is expected to be consistent with sustaining maximum employment and inflation at the Federal Open Market Committee's 2 percent longer-run objective, π^{LR}. In addition, u_t^{LR} is the rate of unemployment expected 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 an effective lower bound (ELB) of 12.5 basis points.

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) to represent the rules in terms of the unemployment rate. The rules are implemented as responding to core personal consumption expenditures (PCE) inflation rather than to headline PCE inflation because current and near-term core inflation rates tend to outperform headline inflation rates as predictors of the medium-term behavior of headline inflation. Box note 6 provides references for the policy rules.

first-difference rule include an estimate of the neutral real interest rate in the longer run (r_t^{LR}).[9]

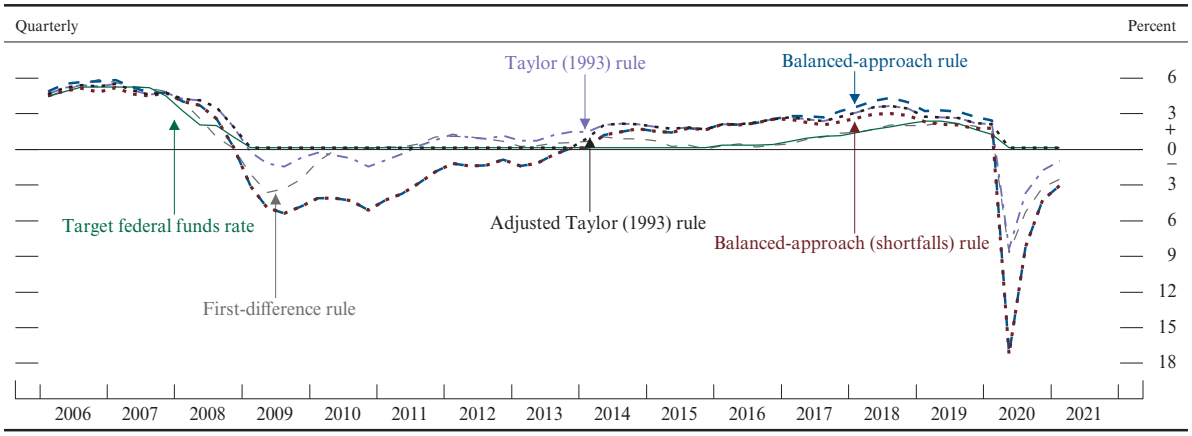
By construction, the balanced-approach (shortfalls) rule prescribes identical policy rates to those prescribed by the balanced-approach rule at times when the unemployment rate is above its estimated longer-run level. However, when the unemployment rate is below that level, the balanced-approach (shortfalls) rule is more accommodative than the balanced-approach rule because it does not call for the policy rate to rise as the unemployment rate drops further.

Unlike the other simple rules featured here, the adjusted Taylor (1993) rule recognizes that the federal funds rate cannot be reduced materially below the ELB. To make up for the cumulative shortfall in accommodation following a recession during which the federal funds rate has fallen to its ELB, the adjusted Taylor (1993) rule prescribes delaying the return of the policy rate to the (positive) levels prescribed by the standard Taylor (1993) rule until after the economy begins to recover.

(continued)

9. The neutral real interest rate in the longer run (r_t^{LR}) is the level of the real federal funds rate that is expected to be consistent, in the longer run, with maximum employment and stable inflation. Like u_t^{LR}, r_t^{LR} is determined largely by nonmonetary factors. The first-difference rule shown in figure A does not involve an estimate of r_t^{LR}. However, this rule has its own shortcomings. For example, research suggests that this sort of rule often results in greater volatility in employment and inflation relative to what would be obtained under the Taylor (1993) and balanced-approach rules.

B. Historical federal funds rate prescriptions from simple policy rules



NOTE: The rules use historical values of the federal funds rate, core personal consumption expenditures inflation, and the unemployment rate. Quarterly projections of longer-run values for the federal funds rate and the unemployment rate are derived through interpolations of the biannual projections from Blue Chip Economic Indicators. The longer-run value for inflation is taken as 2 percent.

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

Policy Rules: Prescriptions

Figure B shows historical prescriptions for the federal funds rate from the five rules. For each period, the figure reports the policy rates prescribed by the rules, taking as given the prevailing economic conditions and estimates of u_t^{LR} and r_t^{LR} at the time. The four rules whose formulas do not impose a lower bound on the value of the federal funds rate imply prescriptions of strongly negative policy rates in response to the pandemic-driven recession, well below their respective troughs in the 2008–09 recession. The prescriptions of the balanced-approach and balanced-approach (shortfalls) rules are the most negative because these rules call for relatively large responses to resource slack. The negative prescriptions of the four rules show the extent to which policymakers' ability to support the economy through reductions in the federal funds rate has been constrained by the ELB during the pandemic-driven recession—a constraint that underlines the importance of the FOMC's other policy actions at the time, including forward guidance about the federal funds rate and large-scale asset purchases.

Regarding the recovery from the 2008–09 recession, all of the simple rules shown here prescribed departure from the ELB well before the FOMC determined that it was appropriate to raise the federal funds rate. The FOMC judged, on the basis of a wide range of information available at the time, that it was appropriate to maintain a more accommodative path of the federal funds rate than prescribed by these rules. Similarly, in the aftermath of the pandemic-driven recession, the FOMC has been drawing from a broad range of indicators, analyses, and judgments in making its determinations concerning the appropriate stance for monetary policy, including readings on public health, labor market conditions, inflation pressures and inflation expectations, and financial and international developments. Under the FOMC's flexible form of average inflation targeting, departure from the ELB might be delayed relative to the simple rules by the desire to see inflation run moderately above 2 percent for some time. While the simple rules are concerned with period-by-period inflation, the Committee aims for a sustained return of inflation to the 2 percent objective.

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

The Federal Reserve's asset purchases since March 2020 have resulted in a large and rapid expansion of the Federal Reserve's balance sheet. Federal Reserve assets totaled $4.2 trillion before the pandemic in January 2020 and have since grown to $8.1 trillion (figure A). As net asset purchases proceed at a pace of $120 billion per month, the Federal Reserve's total liabilities increase correspondingly.[1] Alongside this growth in aggregate liabilities arising from asset purchases, there have also been large compositional shifts between liabilities this year due to factors that are not directly related to monetary policy decisions (figure B). This discussion reviews recent developments in the Federal Reserve's balance sheet and associated changes in money market conditions.

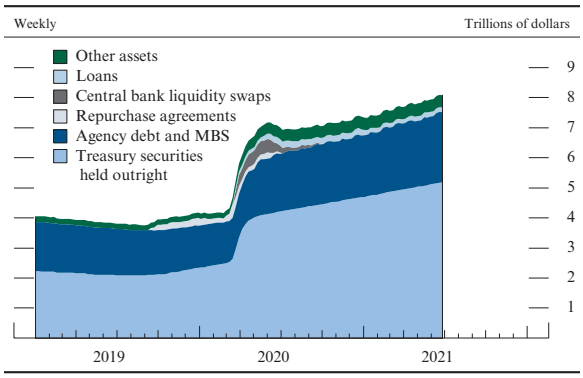
Reserve balances are the largest liability on the Federal Reserve's balance sheet. Federal Reserve asset purchases are settled by adding reserves to the banking system; thus, the magnitude of asset purchases since the onset of the pandemic has brought reserves to record levels.[2] Reserves grew substantially earlier this year, from $3.1 trillion in early January to $3.9 trillion by early April. The level of reserves was, however, mostly stable from April to June 2021, reflecting growth in other liabilities such as the overnight reverse repurchase agreement (ON RRP) facility.

In light of the Federal Reserve's role as fiscal agent for the federal government, the U.S. Treasury holds balances in the Treasury General Account (TGA), which is another liability on the Federal Reserve's balance sheet. Changes in the TGA affect other Federal Reserve liabilities such as reserves and may have implications for money market conditions. A reduction in the TGA increases the level of reserves, other things being equal, as the Treasury makes payments to individuals and businesses, which may increase private deposits in the banking system. An important recent development in this regard has been the substantial drawdown of the TGA over the first half of 2021. With the enactment of pandemic-related fiscal stimulus measures through multiple rounds of federal legislation in 2020 and 2021, the Treasury's balance in the TGA increased to unprecedentedly high levels. As shown in figure C, as the bulk of the most recent fiscal stimulus payments and tax refunds came to an end, the Treasury lowered its outstanding balance in the TGA from about $1.6 trillion at the end of January 2020 to about $850 billion by the end of June 2021. As the Treasury sought to reduce its TGA balance, the Treasury also lowered its net issuance of Treasury bills substantially in 2021.

The developments with reserves, the TGA, and Treasury bill issuance have affected money markets in 2021. The recent large increases in reserves, resulting

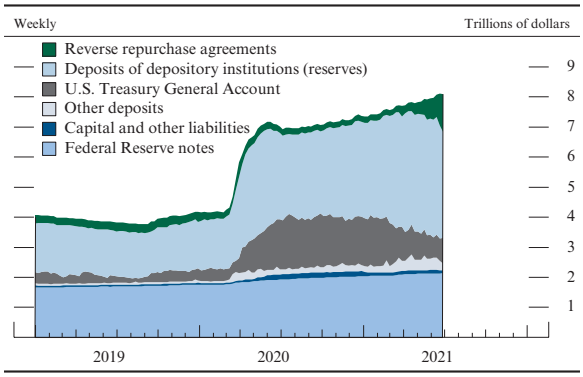
(continued)

A. Federal Reserve assets



NOTE: The data extend through June 30, 2021. MBS is mortgage-backed securities. The key identifies shaded areas in order from top to bottom.
SOURCE: Federal Reserve Board, Statistical Release H.4.1, "Factors Affecting Reserve Balances."

B. Federal Reserve liabilities



NOTE: The data extend through June 30, 2021. "Capital and other liabilities" includes Treasury contributions. The key identifies shaded areas in order from top to bottom.
SOURCE: Federal Reserve Board, Statistical Release H.4.1, "Factors Affecting Reserve Balances."

1. For general explanations of several liabilities on the Federal Reserve's balance sheet, see the box "The Role of Liabilities in Determining the Size of the Federal Reserve's Balance Sheet" in Board of Governors of the Federal Reserve System (2019), *Monetary Policy Report* (Washington: Board of Governors, February), pp. 41–43, https://www.federalreserve.gov/monetarypolicy/files/20190222_mprfullreport.pdf.

2. Reserves consist of deposits held at Federal Reserve Banks by depository institutions, such as commercial banks, savings banks, credit unions, thrift institutions, and U.S. branches and agencies of foreign banks. Reserve balances allow depository institutions to facilitate daily payment flows, both in ordinary times and in stress scenarios, without borrowing funds or selling assets.

C. Balance sheet comparison
(Billions of dollars)

	6/30/2021	1/27/2021	Change
Assets			
Total securities			
Treasury securities	5,183	4,766	417
Agency debt and MBS	2,322	2,072	250
Net unamortized premiums	351	345	6
Repurchase agreements	0	1	−1
Loans and lending facilities			
PPPLF	91	47	44
Other loans and lending facilities	72	91	−19
Central bank liquidity swaps	1	10	−9
Other assets	58	74	−16
Total assets	**8,079**	**7,405**	**674**
Liabilities and capital			
Federal Reserve notes	2,134	2,049	85
Reserves held by depository institutions	3,512	3,229	283
Reverse repurchase agreements			
Foreign official and international accounts	269	209	60
Others	992	1	991
U.S. Treasury General Account	852	1,613	−761
Other deposits	230	203	27
Other liabilities and capital	90	101	−11
Total liabilities and capital	**8,079**	**7,405**	**674**

Note: MBS is mortgage-backed securities. PPPLF is Paycheck Protection Program Liquidity Facility.
Source: Federal Reserve Board, Statistical Release H.4.1, "Factors Affecting Reserve Balances."

from both asset purchases and reductions in the TGA, have put broad but modest downward pressure on short-term interest rates over recent months. Additionally, the net declines in Treasury bill supply have put downward pressure on bill yields, which similarly affected rates on close substitutes to bills such as repurchase agreements (repos) collateralized by Treasury securities.[3]

In this environment of ample liquidity and downward pressure on money market rates, the Federal Reserve's ON RRP facility has seen a historically large increase in usage since April 2021, primarily driven by greater participation from government money market funds. Take-up at the ON RRP facility reached record levels—nearly $1 trillion by the end of June 2021. In light of the potential for expanded use of the facility and given growth in money market fund assets under management in recent years, the Federal Open Market Committee (FOMC) raised the per-counterparty cap on ON RRP participation to $80 billion per day from $30 billion at the March 2021 FOMC meeting. With the increase in usage, the ON RRP facility continued to serve its intended purpose of helping to provide a floor under short-term interest rates.[4]

The recent spike in facility usage reflected government money market funds turning to the facility because of their large inflows. Certain banks reportedly sought to limit further growth of their reserve holdings and of certain deposit liabilities. This phenomenon has reportedly been important in recent months in driving additional inflows into money market funds in lieu of bank deposits. Additionally, money market funds faced a relative lack of eligible short-term investments amid declining Treasury bill supply and reduced demand for repo funding on the part of borrowers. In this situation, the ON RRP has provided money market funds with an additional investment option for these inflows despite its offering rate being at 0 percent through mid-June.

Other deposits, another liability on the Federal Reserve's balance sheet, include deposits from government-sponsored enterprises (GSEs) and designated financial market utilities. These deposits roughly doubled since the beginning of 2021 to $408 billion by mid-June, reflecting in part the same money market conditions that drove higher ON RRP take-up.

Following the June 2021 FOMC meeting, the Federal Reserve made a technical adjustment to its administered rates: interest on excess reserves and the ON RRP offering rate. Both rates were increased 5 basis points in order to keep the federal funds rate well within the FOMC's target range and to support smooth functioning of short-term funding markets. ON RRP take-up rose substantially over subsequent days. This increase reflected shifts to the ON RRP from GSEs' deposits at the Federal Reserve that do not earn interest as well as additional participation from money market funds. Following the technical adjustment, short-term market interest rates adjusted slightly higher, largely in step with the increase in administered rates. The effective federal funds rate rose to 10 basis points, while the Secured Overnight Financing Rate increased to 5 basis points.

3. For further information on recent money market developments, see the Financial Developments section in Part 1 of this report.

4. The ON RRP facility helps keep the effective federal funds rate from falling below the target range set by the FOMC, as institutions with access to the ON RRP should be unwilling to lend funds below the ON RRP's pre-announced offering rate. The ON RRP facility is primarily used by nonbank counterparties such as money market funds. The rate offered through the ON RRP facility complements the interest on excess reserves rate in supporting effective monetary policy implementation. The Federal Reserve provides a similar service to foreign official and international accounts (primarily foreign central banks), though these balances have not seen notable growth in recent months.

Part 3
Summary of Economic Projections

The following material was released after the conclusion of the June 15–16, 2021, meeting of the Federal Open Market Committee.

In conjunction with the Federal Open Market Committee (FOMC) meeting held on June 15–16, 2021, 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 2021 to 2023 and over the longer run. Each participant's projections were based on information available at the time of the meeting, together with her or his assessment of appropriate monetary policy—including a path for the federal funds rate and its longer-run value—and assumptions about other factors likely to affect economic outcomes.

The longer-run projections represent each participant's assessment of the value to which each variable would be expected to converge, over time, under appropriate monetary policy and in the absence of further shocks to the economy. "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.

Table 1. Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents, under their individual assumptions of projected appropriate monetary policy, June 2021

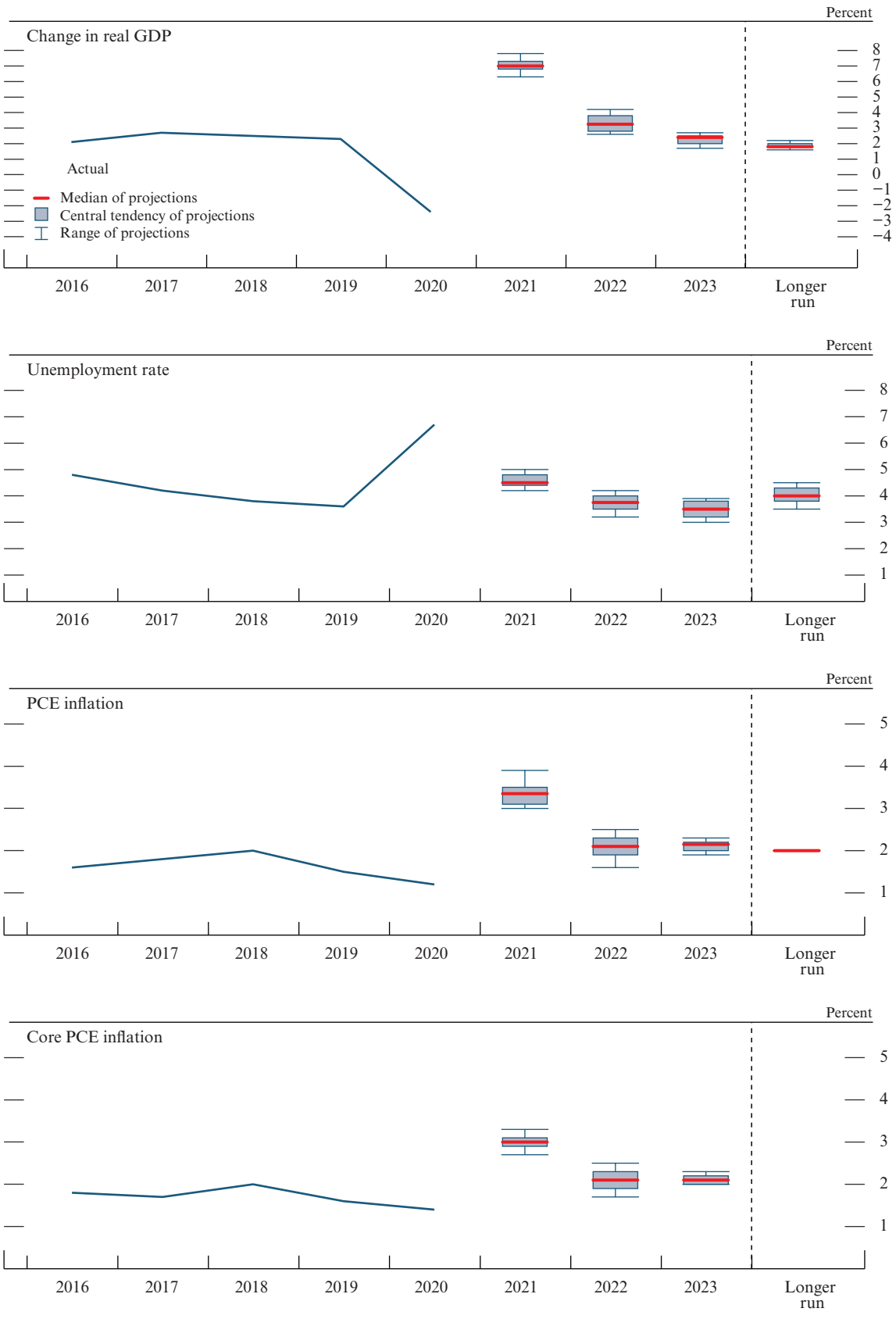
Percent

Variable	Median[1]				Central tendency[2]				Range[3]			
	2021	2022	2023	Longer run	2021	2022	2023	Longer run	2021	2022	2023	Longer run
Change in real GDP	7.0	3.3	2.4	1.8	6.8–7.3	2.8–3.8	2.0–2.5	1.8–2.0	6.3–7.8	2.6–4.2	1.7–2.7	1.6–2.2
March projection	6.5	3.3	2.2	1.8	5.8–6.6	3.0–3.8	2.0–2.5	1.8–2.0	5.0–7.3	2.5–4.4	1.7–2.6	1.6–2.2
Unemployment rate	4.5	3.8	3.5	4.0	4.4–4.8	3.5–4.0	3.2–3.8	3.8–4.3	4.2–5.0	3.2–4.2	3.0–3.9	3.5–4.5
March projection	4.5	3.9	3.5	4.0	4.2–4.7	3.6–4.0	3.2–3.8	3.8–4.3	4.0–5.5	3.2–4.2	3.0–4.0	3.5–4.5
PCE inflation	3.4	2.1	2.2	2.0	3.1–3.5	1.9–2.3	2.0–2.2	2.0	3.0–3.9	1.6–2.5	1.9–2.3	2.0
March projection	2.4	2.0	2.1	2.0	2.2–2.4	1.8–2.1	2.0–2.2	2.0	2.1–2.6	1.8–2.3	1.9–2.3	2.0
Core PCE inflation[4]	3.0	2.1	2.1		2.9–3.1	1.9–2.3	2.0–2.2		2.7–3.3	1.7–2.5	2.0–2.3	
March projection	2.2	2.0	2.1		2.0–2.3	1.9–2.1	2.0–2.2		1.9–2.5	1.8–2.3	1.9–2.3	
Memo: Projected appropriate policy path												
Federal funds rate	0.1	0.1	0.6	2.5	0.1	0.1–0.4	0.1–1.1	2.3–2.5	0.1	0.1–0.6	0.1–1.6	2.0–3.0
March projection	0.1	0.1	0.1	2.5	0.1	0.1–0.4	0.1–0.9	2.3–2.5	0.1	0.1–0.6	0.1–1.1	2.0–3.0

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 16–17, 2021. 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 16–17, 2021, meeting, and one participant did not submit such projections in conjunction with the June 15–16, 2021, meeting.

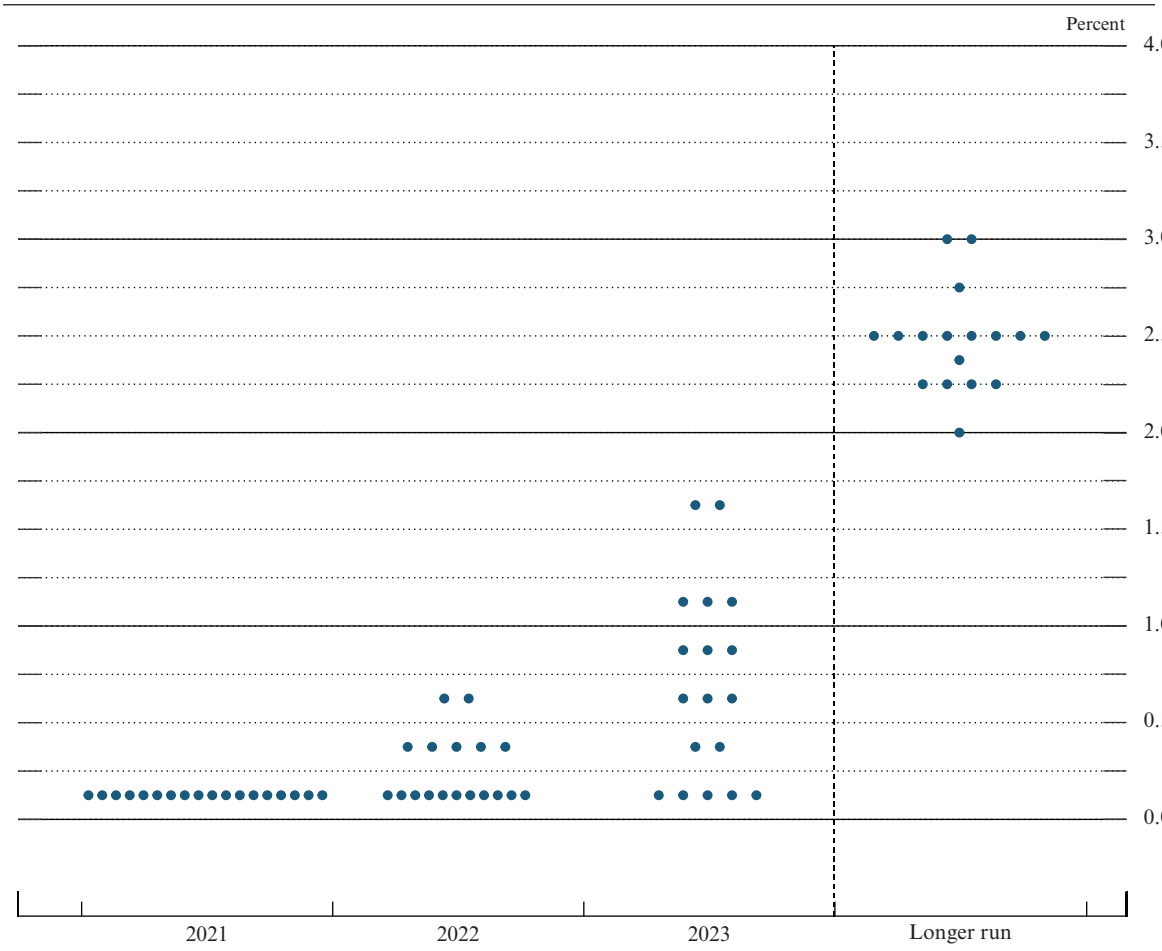
1. For each period, the median is the middle projection when the projections are arranged from lowest to highest. When the number of projections is even, the median is the average of the two middle projections.
2. The central tendency excludes the three highest and three lowest projections for each variable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

Figure 1. Medians, central tendencies, and ranges of economic projections, 2021–23 and over the longer run



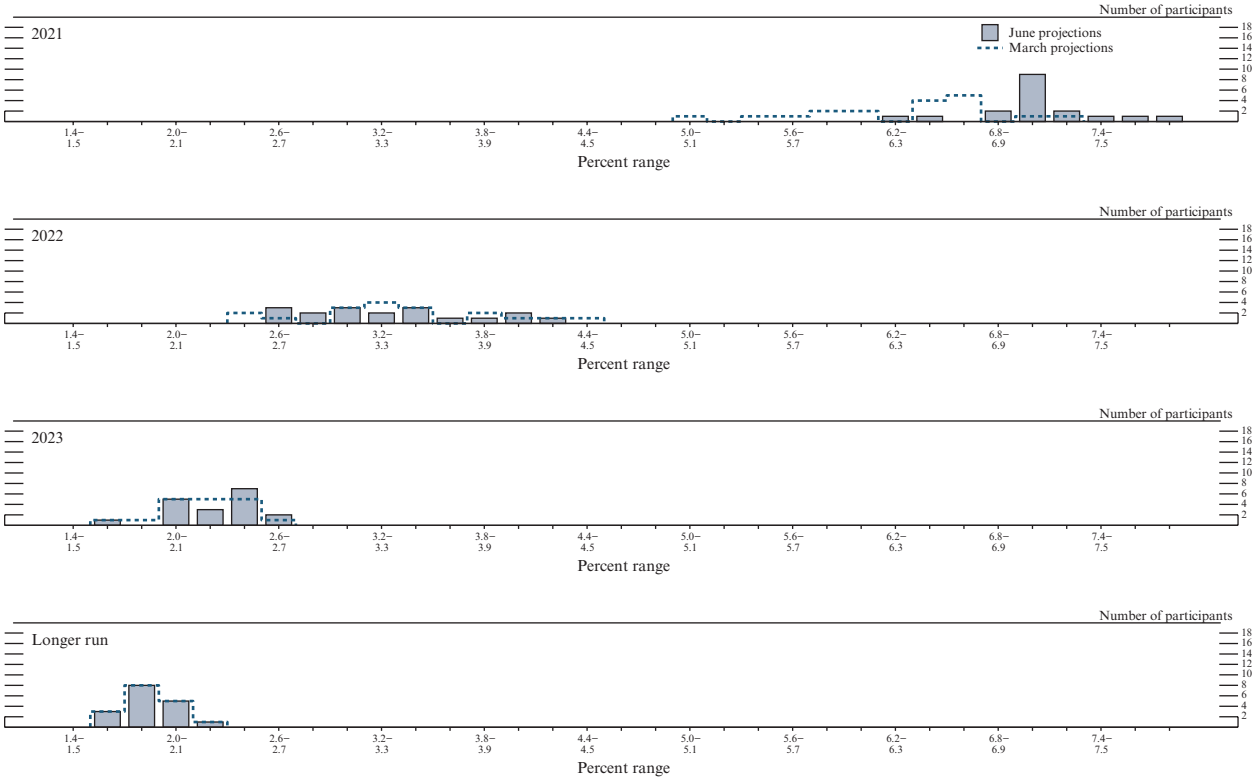
NOTE: Definitions of variables and other explanations are in the notes to table 1. The data for the actual values of the variables are annual.

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



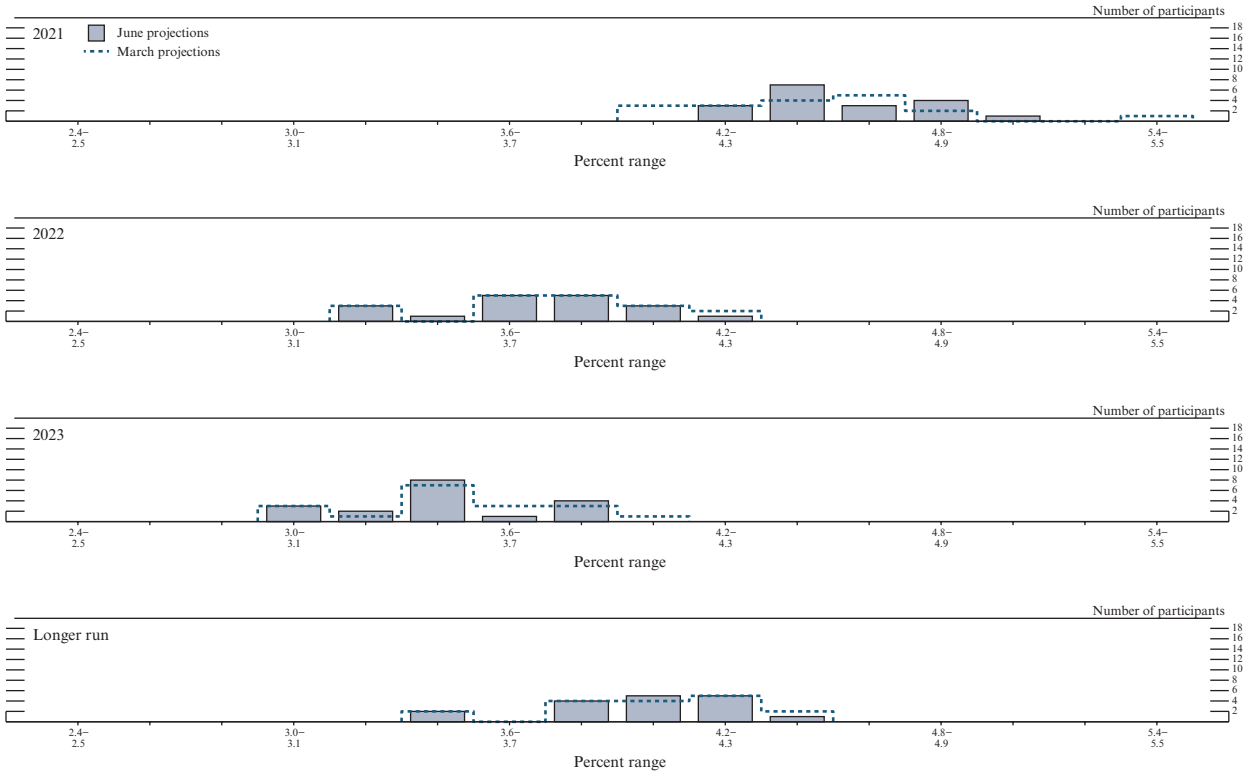
NOTE: Each shaded circle indicates the value (rounded to the nearest 1/8 percentage point) of an individual participant's judgment of the midpoint of the appropriate target range for the federal funds rate or the appropriate target level for the federal funds rate at the end of the specified calendar year or over the longer run. One participant did not submit longer-run projections for the federal funds rate.

Figure 3.A. Distribution of participants' projections for the change in real GDP, 2021–23 and over the longer run



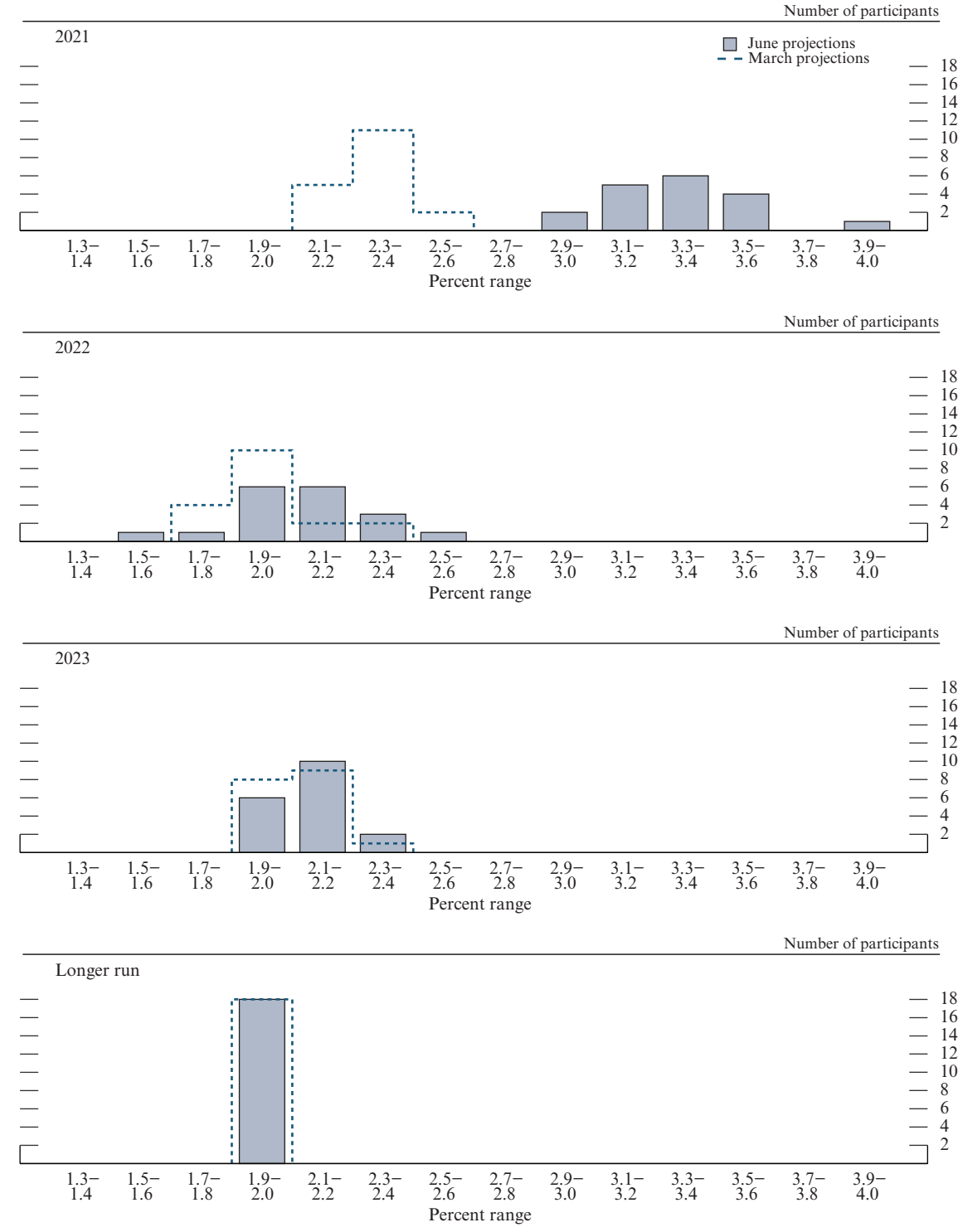
NOTE: Definitions of variables and other explanations are in the notes to table 1.

Figure 3.B. Distribution of participants' projections for the unemployment rate, 2021–23 and over the longer run



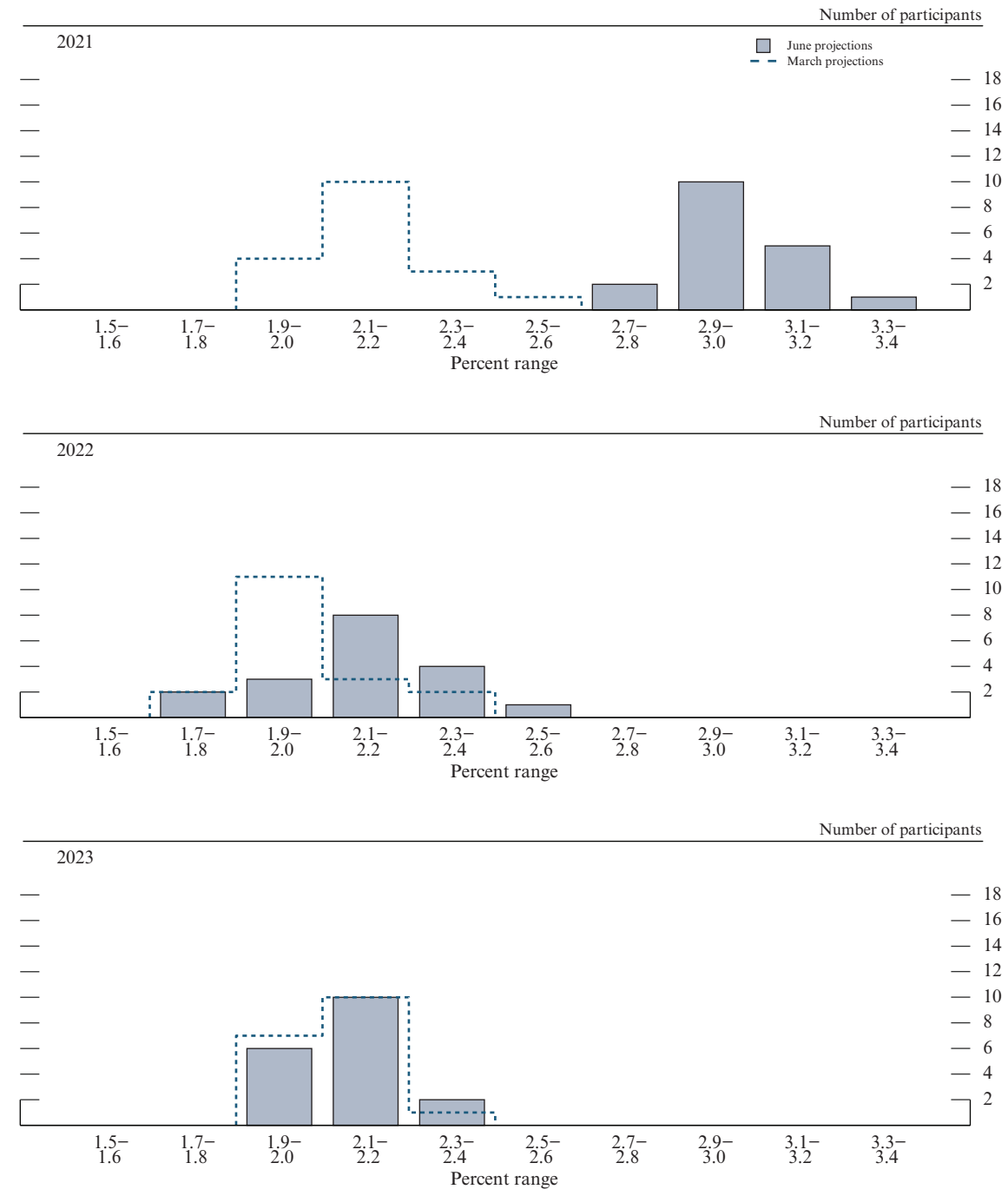
NOTE: Definitions of variables and other explanations are in the notes to table 1.

Figure 3.C. Distribution of participants' projections for PCE inflation, 2021–23 and over the longer run



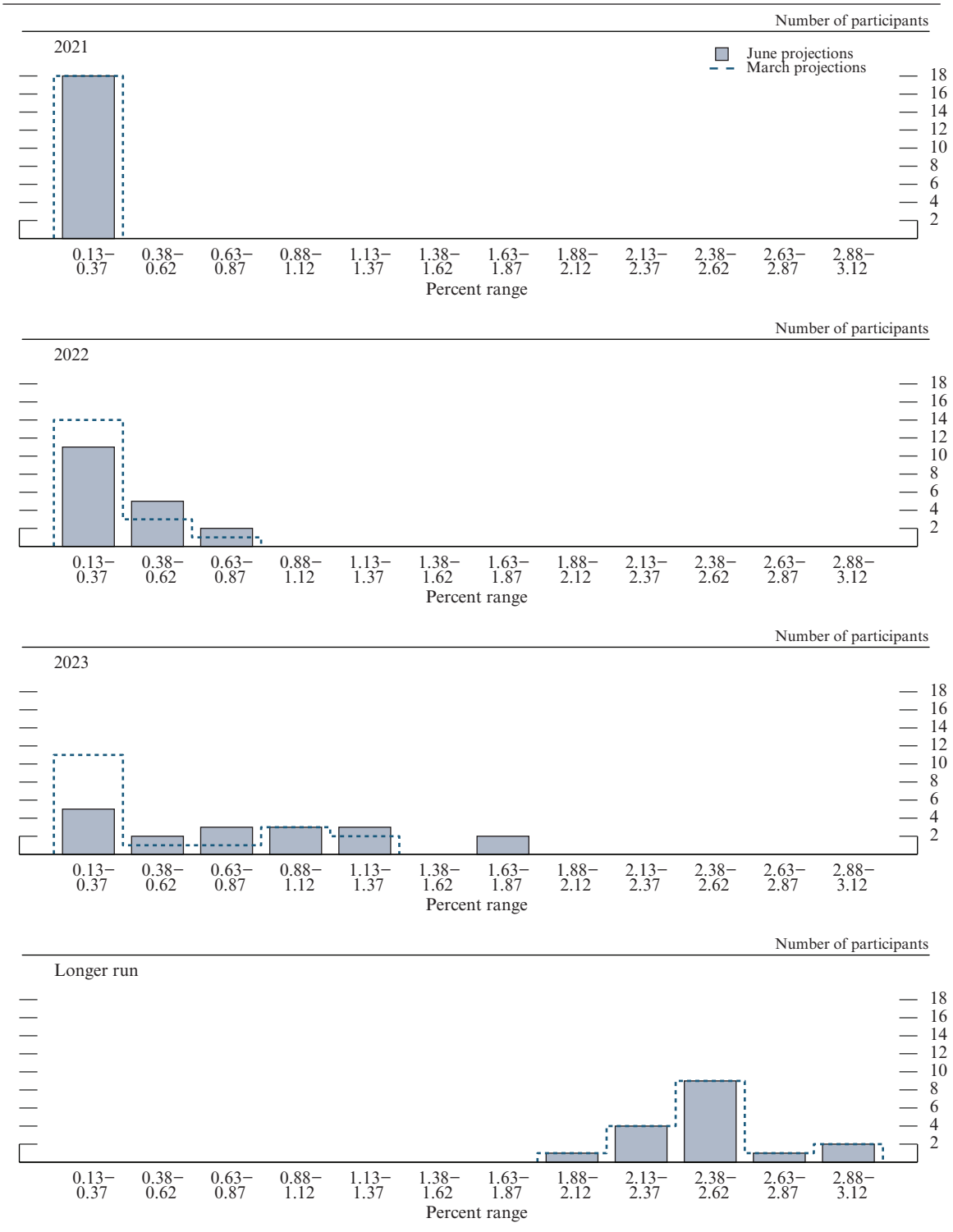
NOTE: Definitions of variables and other explanations are in the notes to table 1.

Figure 3.D. Distribution of participants' projections for core PCE inflation, 2021–23



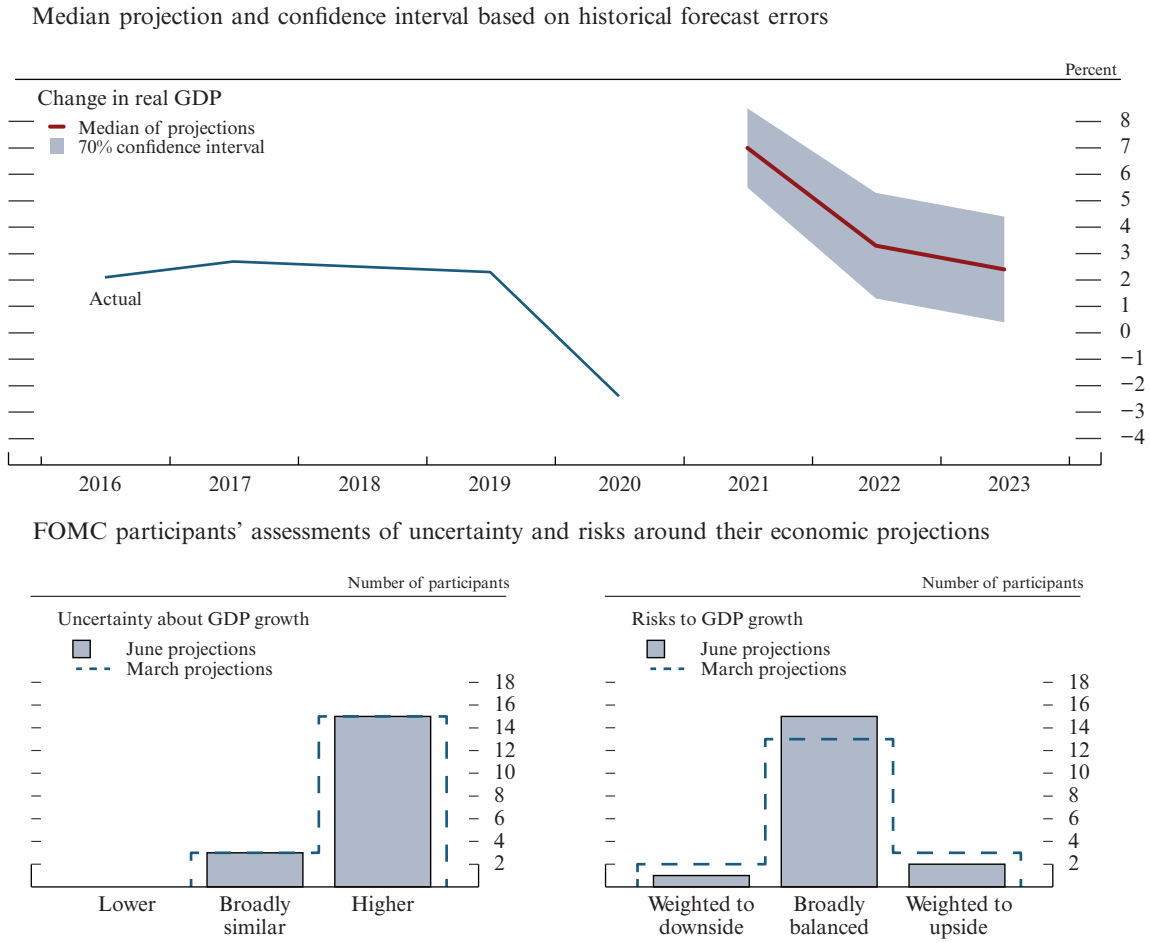
NOTE: Definitions of variables and other explanations are in the notes to table 1.

Figure 3.E. Distribution of participants' judgments of the midpoint of the appropriate target range for the federal funds rate or the appropriate target level for the federal funds rate, 2021–23 and over the longer run



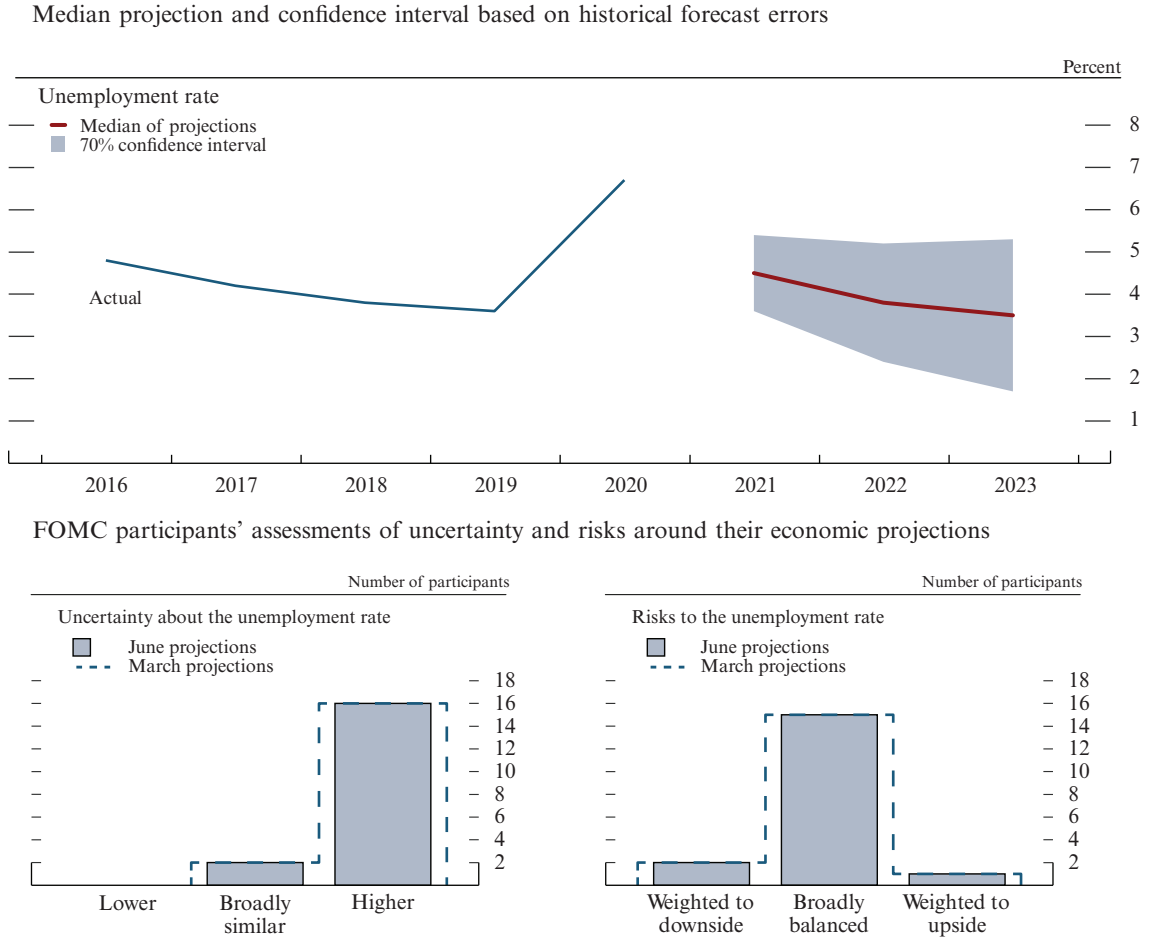
NOTE: Definitions of variables and other explanations are in the notes to table 1.

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



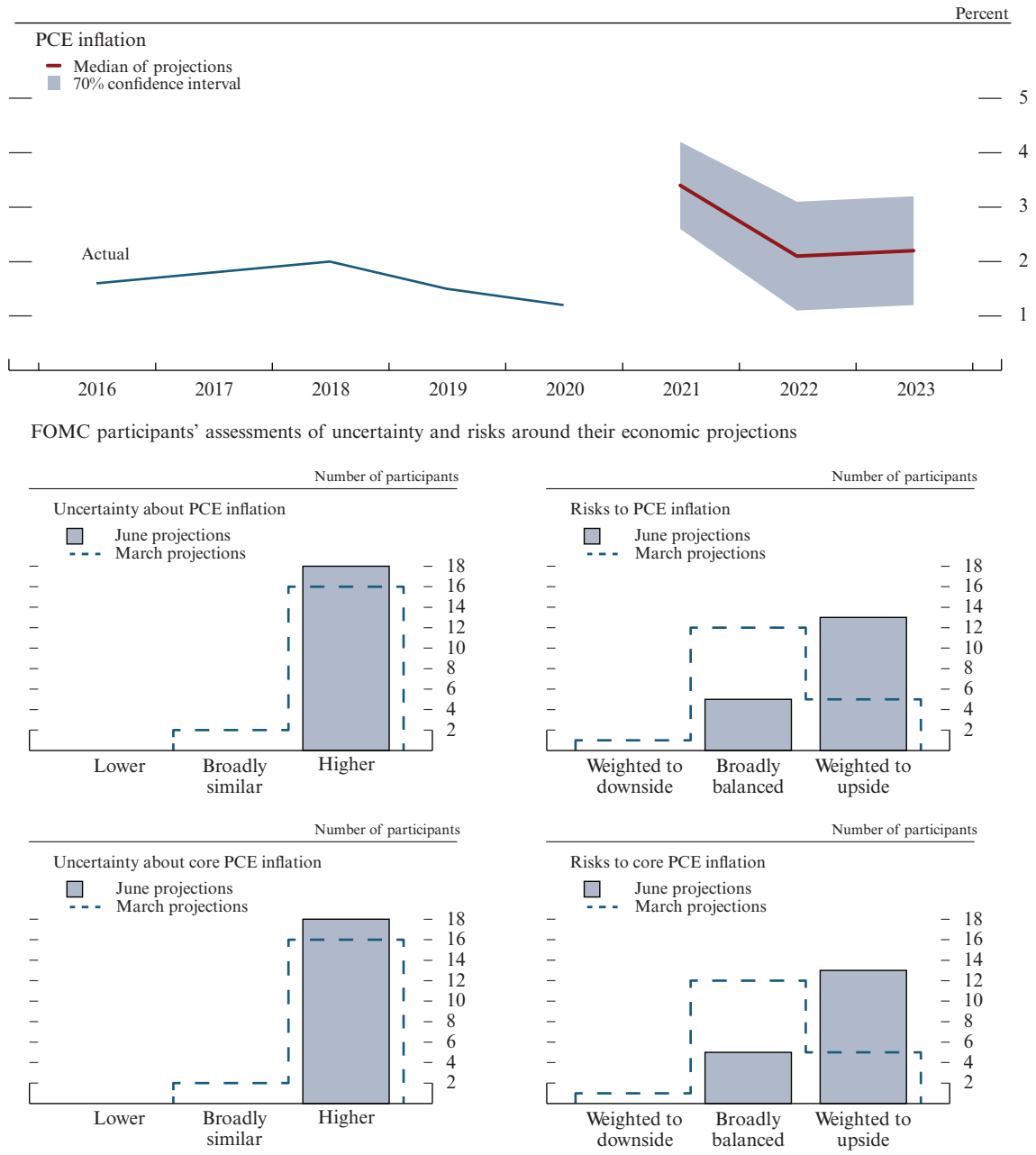
NOTE: The blue and red lines in the top panel show actual values and median projected values, respectively, of the percent change in real gross domestic product (GDP) from the fourth quarter of the previous year to the fourth quarter of the year indicated. The confidence interval around the median projected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

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



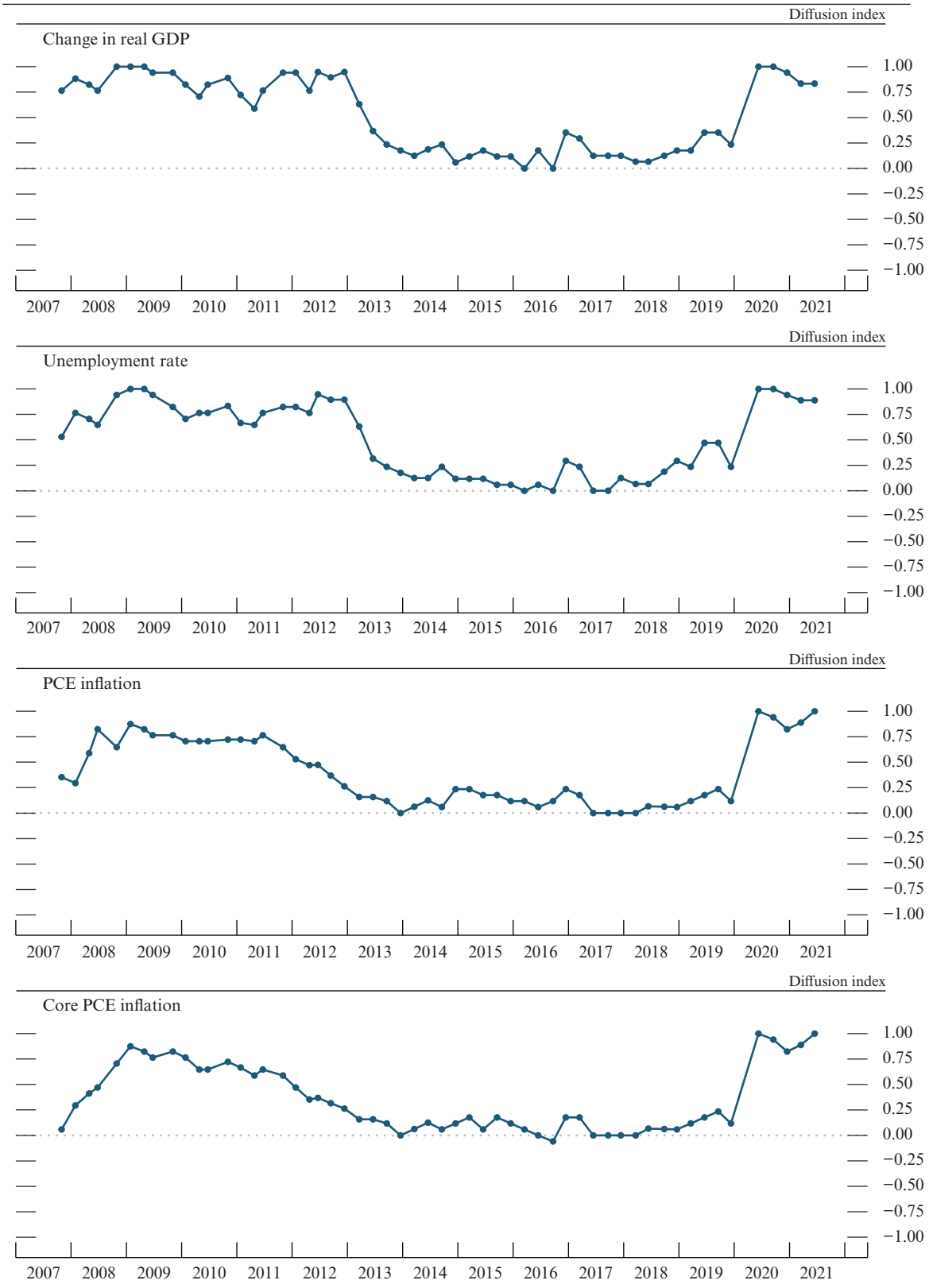
NOTE: The blue and red lines in the top panel show actual values and median projected values, respectively, of the average civilian unemployment rate in the fourth quarter of the year indicated. The confidence interval around the median projected values is assumed to be symmetric and is based on root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

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



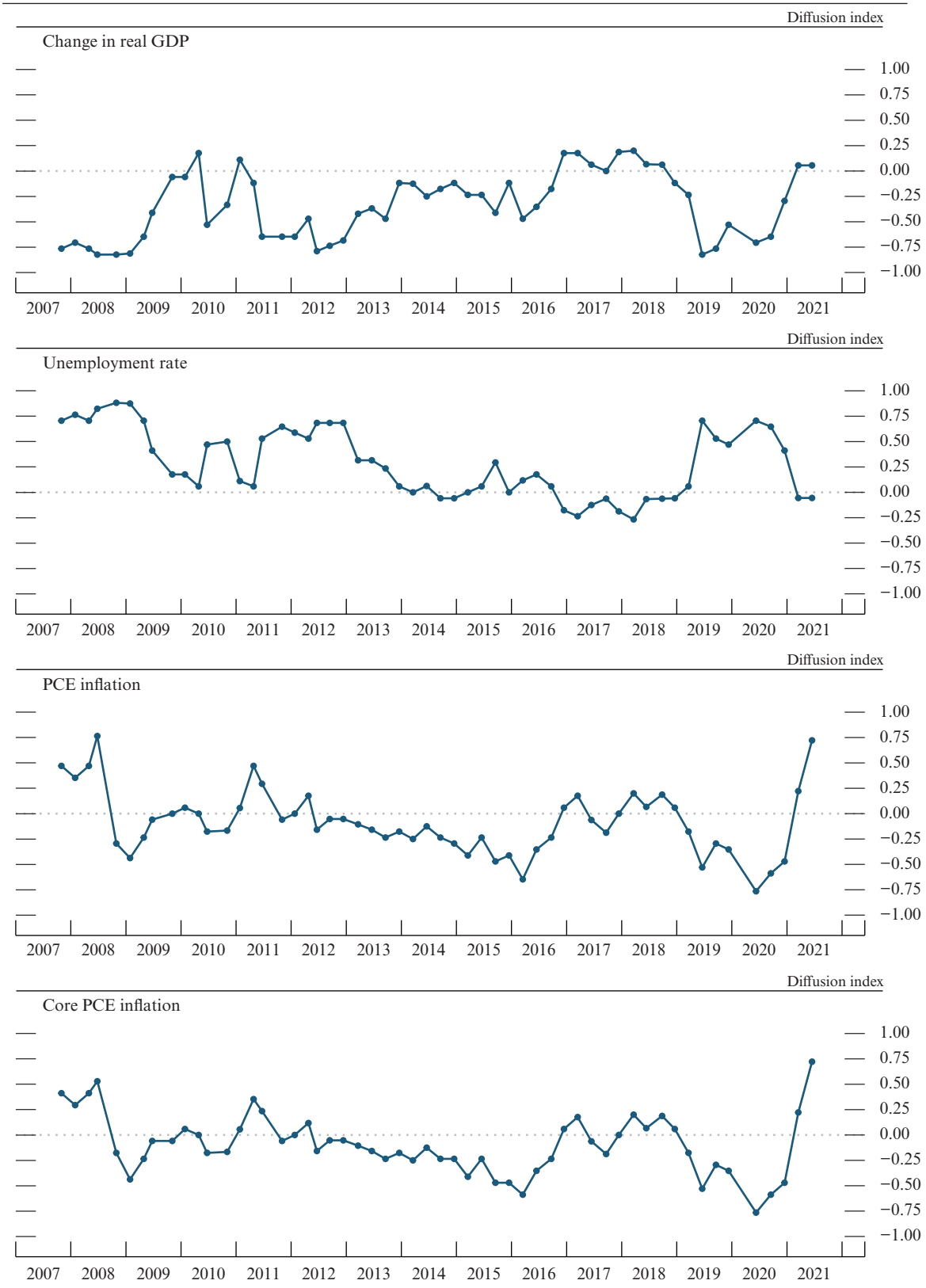
NOTE: The blue and red lines in the top panel show actual values and median projected values, respectively, of the percent change in the price index for personal consumption expenditures (PCE) from the fourth quarter of the previous year to the fourth quarter of the year indicated. The confidence interval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

Figure 4.D. Diffusion indexes of participants' uncertainty assessments



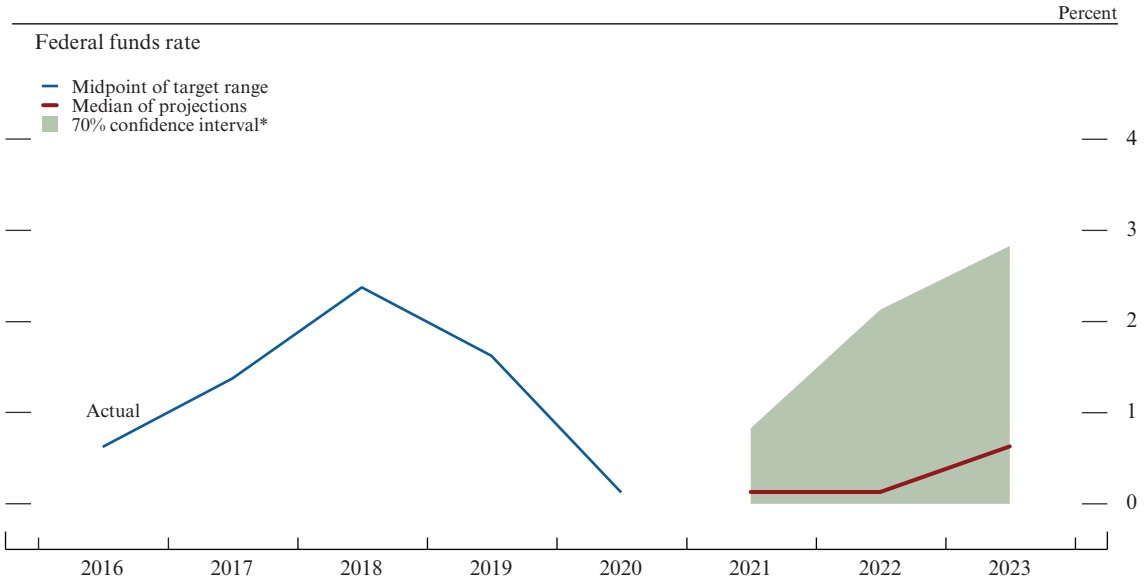
NOTE: For each SEP, participants provided responses to the question "Please indicate your judgment of the uncertainty attached to your projections relative to the levels of uncertainty over the past 20 years." Each point in the diffusion indexes represents the number of participants who responded "Higher" minus the number who responded "Lower," divided by the total number of participants. Figure excludes March 2020 when no projections were submitted.

Figure 4.E. Diffusion indexes of participants' risk weightings



NOTE: For each SEP, participants provided responses to the question "Please indicate your judgment of the risk weighting around your projections." Each point in the diffusion indexes represents the number of participants who responded "Weighted to the Upside" minus the number who responded "Weighted to the Downside," divided by the total number of participants. Figure excludes March 2020 when no projections were submitted.

Figure 5. Uncertainty and risks in projections of the federal funds rate



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

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

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

Table 2. Average historical projection error ranges

Percentage points

Variable	2021	2022	2023
Change in real GDP[1]	±1.5	±2.0	±2.0
Unemployment rate[1]	±0.9	±1.4	±1.8
Total consumer prices[2]	±0.8	±1.0	±1.0
Short-term interest rates[3]	±0.7	±2.0	±2.2

NOTE: Error ranges shown are measured as plus or minus the root mean squared error of projections for 2001 through 2020 that were released in the summer by various private and government forecasters. As described in the box "Forecast Uncertainty," under certain assumptions, there is about a 70 percent probability that actual outcomes for real GDP, unemployment, consumer prices, and the federal funds rate will be in ranges implied by the average size of projection errors made in the past. For more information, see David Reifschneider and Peter Tulip (2017), "Gauging the Uncertainty of the Economic Outlook Using Historical Forecasting Errors: The Federal Reserve's Approach," Finance and Economics Discussion Series 2017-020 (Washington: Board of Governors of the Federal Reserve System, February), https://dx.doi.org/10.17016/FEDS.2017.020.

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

2. Measure is the overall consumer price index, the price measure that has been most widely used in government and private economic forecasts. Projections are percent changes on a fourth quarter to fourth quarter basis.

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

Forecast Uncertainty

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

Table 2 summarizes the average historical accuracy of a range of forecasts, including those reported in past *Monetary Policy Report*s and those prepared by the Federal Reserve Board's staff in advance of meetings of the Federal Open Market Committee (FOMC). The projection error ranges shown in the table illustrate the considerable uncertainty associated with economic forecasts. For example, suppose a participant projects that real gross domestic product (GDP) and total consumer prices will rise steadily at annual rates of, respectively, 3 percent and 2 percent. If the uncertainty attending those projections is similar to that experienced in the past and the risks around the projections are broadly balanced, the numbers reported in table 2 would imply a probability of about 70 percent that actual GDP would expand within a range of 1.5 to 4.5 percent in the current year and 1.0 to 5.0 percent in the second and third years. The corresponding 70 percent confidence intervals for overall inflation would be 1.2 to 2.8 percent in the current year and 1.0 to 3.0 percent in the second and third years. Figures 4.A through 4.C illustrate these confidence bounds in "fan charts" that are symmetric and centered on the medians of FOMC participants' projections for GDP growth, the unemployment rate, and inflation. However, in some instances, the risks around the projections may not be symmetric. In particular, the unemployment rate cannot be negative; furthermore, the risks around a particular projection might be tilted to either the upside or the downside, in which case the corresponding fan chart would be asymmetrically positioned around the median projection.

Because current conditions may differ from those that prevailed, on average, over history, participants provide judgments as to whether the uncertainty attached to their projections of each economic variable is greater than, smaller than, or broadly similar to typical levels of forecast uncertainty seen in the past 20 years, as presented in table 2 and reflected in the widths of the confidence intervals shown in the top panels of figures 4.A through 4.C. Participants' current assessments of the uncertainty surrounding their projections are summarized in the bottom-left panels

(continued)

of those figures. Participants also provide judgments as to whether the risks to their projections are weighted to the upside, are weighted to the downside, or are broadly balanced. That is, while the symmetric historical fan charts shown in the top panels of figures 4.A through 4.C imply that the risks to participants' projections are balanced, participants may judge that there is a greater risk that a given variable will be above rather than below their projections. These judgments are summarized in the lower-right panels of figures 4.A through 4.C.

As with real activity and inflation, the outlook for the future path of the federal funds rate is subject to considerable uncertainty. This uncertainty arises primarily because each participant's assessment of the appropriate stance of monetary policy depends importantly on the evolution of real activity and inflation over time. If economic conditions evolve in an unexpected manner, then assessments of the appropriate setting of the federal funds rate would change from that point forward. The final line in table 2 shows the error ranges for forecasts of short-term interest rates. They suggest that the historical confidence intervals associated with projections of the federal funds rate are quite wide. It should be noted, however, that these confidence intervals are not strictly consistent with the projections for the federal funds rate, as these projections are not forecasts of the most likely quarterly outcomes but rather are projections of participants' individual assessments of appropriate monetary policy and are on an end-of-year basis. However, the forecast errors should provide a sense of the uncertainty around the future path of the federal funds rate generated by the uncertainty about the macroeconomic variables as well as additional adjustments to monetary policy that would be appropriate to offset the effects of shocks to the economy.

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

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

Abbreviations

AFE	advanced foreign economy
CBO	Congressional Budget Office
CIE	common inflation expectations
CMBS	commercial mortgage-backed securities
COVID-19	coronavirus disease 2019
CPI	consumer price index
CPS	Current Population Survey
CRE	commercial real estate
EFFR	effective federal funds rate
ELB	effective lower bound
EME	emerging market economy
EPOP ratio	employment-to-population ratio
FIMA	Foreign and International Monetary Authorities
FOMC	Federal Open Market Committee; also, the Committee
FPUC	Federal Pandemic Unemployment Compensation
GDP	gross domestic product
LFPR	labor force participation rate
MBS	mortgage-backed securities
MMF	money market fund
ON RRP	overnight reverse repurchase agreement
OPEC	Organization of the Petroleum Exporting Countries
PCE	personal consumption expenditures
PEUC	Pandemic Emergency Unemployment Compensation
PPP	Paycheck Protection Program
PUA	Pandemic Unemployment Assistance
repo	repurchase agreement
SMCCF	Secondary Market Corporate Credit Facility
S&P	Standard & Poor's
TGA	Treasury General Account
TIPS	Treasury Inflation-Protected Securities
UI	unemployment insurance
VIX	implied volatility for the S&P 500 index