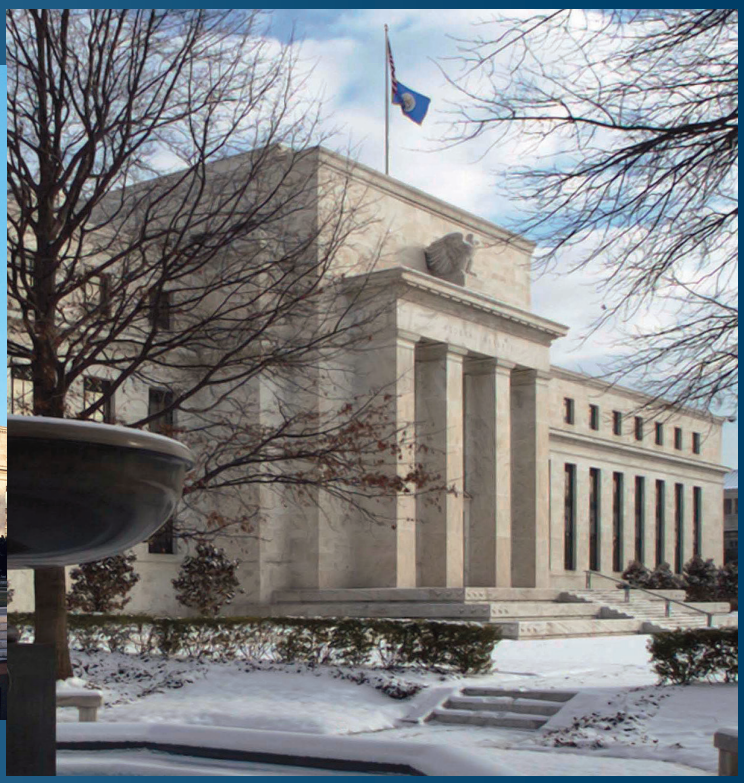
For use at 11:00 a.m. EST
February 19, 2021

Monetary Policy Report

February 19, 2021



Board of Governors of the Federal Reserve System

Letter of Transmittal

Board of Governors of the
Federal Reserve System

Washington, D.C., February 19, 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.

Contents

List of Boxes

Note: This report reflects information that was publicly available as of noon EST on February 17, 2021. Unless otherwise stated, the time series in the figures extend through, for daily data, February 16, 2021; for monthly data, January 2021; and, for quarterly data, 2020:Q4. In bar charts, except as noted, the change for a given period is measured to its final quarter from the final quarter of the preceding period.

Summary

The COVID-19 pandemic continues to weigh heavily on economic activity and labor markets in the United States and around the world, even as the ongoing vaccination campaigns offer hope for a return to more normal conditions later this year. While unprecedented fiscal and monetary stimulus and a relaxation of rigorous social-distancing restrictions supported a rapid rebound in the U.S. labor market last summer, the pace of gains has slowed and employment remains well below pre-pandemic levels. In addition, weak aggregate demand and low oil prices have held down consumer price inflation. In this challenging environment, the Federal Open Market Committee (FOMC) has held its policy rate near zero and has continued to purchase Treasury securities and agency mortgage-backed securities to support the economic recovery. These measures, along with the Committee's strong guidance on interest rates and the balance sheet, will ensure that monetary policy will continue to deliver powerful support to the economy until the recovery is complete.

Economic and Financial Developments

Economic activity and the labor market. The initial wave of COVID-19 infections led to a historic contraction in economic activity as a result of both mandatory restrictions and voluntary changes in behavior by households and businesses. The level of gross domestic product (GDP) fell a cumulative 10 percent over the first half of 2020, and the measured unemployment rate spiked to a post–World War II high of 14.8 percent in April. As mandatory restrictions were subsequently relaxed and households and firms adapted to pandemic conditions, many sectors of the economy recovered rapidly and unemployment fell back. Momentum slowed substantially in the late fall and early winter, however, as spending on many services contracted again amid a worsening of the pandemic. All told, GDP is currently estimated to have declined 2.5 percent over the four quarters of last year and payroll employment in January was almost 10 million jobs below pre-pandemic levels, while the unemployment rate remained elevated at 6.3 percent and the labor force participation rate was severely depressed. Job losses have been most severe and unemployment remains particularly elevated among Hispanics, African Americans, and other minority groups as well as those who hold lower-wage jobs.

Inflation. After declining sharply as the pandemic struck, consumer price inflation rebounded along with economic activity, but inflation remains below pre-COVID levels and the FOMC's longer-run objective of 2 percent. The 12-month measure of PCE (personal consumption expenditures) inflation was 1.3 percent in December, while the measure that excludes food and energy items—so-called core inflation, which is typically less volatile than total inflation—was 1.5 percent. Both total and core inflation were held down in part by prices for services adversely affected by the pandemic, and indicators of longer-run inflation expectations are now at similar levels to those seen in recent years.

Financial conditions. Financial conditions have improved notably since the spring of last year and remain generally accommodative. Low interest rates, the Federal Reserve's asset purchases, the establishment of emergency lending facilities, and other extraordinary actions, together with fiscal policy, continued to support the flow of credit in the economy and smooth market functioning. The nominal Treasury yield curve steepened and equity prices continued to increase steadily in the second half of last year as concerns over the resurgence in COVID-19 cases appeared to have been outweighed by positive news about vaccine prospects and expectations of further

fiscal support. Spreads of yields on corporate bonds over those on comparable-maturity Treasury securities narrowed significantly, partly because the credit quality of firms improved and market functioning remained stable. Mortgage rates for households remain near historical lows. However, financing conditions remain relatively tight for households with low credit scores and for small businesses.

Financial stability. While some financial vulnerabilities have increased since the start of the pandemic, the institutions at the core of the financial system remain resilient. Asset valuation pressures have returned to or exceeded pre-pandemic levels in most markets, including in equity, corporate bond, and residential real estate markets. Although government programs have supported business and household incomes, some businesses and households have become more vulnerable to shocks, as earnings have fallen and borrowing has risen. Strong capital positions before the pandemic helped banks absorb large losses related to the pandemic. Financial institutions, however, may experience additional losses as a result of rising defaults in the coming years, and long-standing vulnerabilities at money market mutual funds and open-end investment funds remain unaddressed. Although some facilities established by the Federal Reserve in the wake of the pandemic have expired, those remaining continue to serve as important backstops against further stress. (See the box "Developments Related to Financial Stability" in Part 1.)

International developments. Mirroring the United States, economic activity abroad bounced back last summer after the spread of the virus moderated and restrictions eased. Subsequent infections and renewed restrictions have again depressed economic activity, however. Relative to the spring, the current slowdown in economic activity has been less dramatic. Fiscal and monetary policies continue to be supportive, and people have adapted to containment measures that have often been less stringent than earlier.

Despite the resurgence of the pandemic in many economies, financial markets abroad have recovered since the spring, buoyed by continued strong fiscal and monetary policy support and the start of vaccination campaigns in many countries. With the abatement of financial stress, the broad dollar has depreciated, more than reversing its appreciation at the onset of the pandemic. On balance, global equity prices have recovered and sovereign credit spreads in emerging market economies and in the European periphery have narrowed. In major advanced economies, sovereign yields remained near historical low levels amid continued monetary policy accommodation.

Monetary Policy

Review of the strategic framework for monetary policy. The Federal Reserve concluded the review of its strategic framework for monetary policy in the second half of 2020. The review was motivated by changes in the U.S. economy that affect monetary policy, including the global decline in the general level of interest rates and the reduced sensitivity of inflation to labor market tightness. In August, the FOMC issued a revised Statement on Longer-Run Goals and Monetary Policy Strategy.[1] The revised statement acknowledges the changes in the economy over recent decades and articulates how policymakers are taking these changes into account in conducting monetary policy. In the revised statement, the Committee indicates that it aims to attain its statutory goals by seeking to eliminate shortfalls from maximum employment—a broad-based and inclusive goal—and achieve inflation that averages 2 percent over time. Achieving inflation that averages 2 percent

1. The statement, revised in August 2020, was unanimously reaffirmed at the FOMC's January 2021 meeting.

over time helps ensure that longer-term inflation expectations remain well anchored at the FOMC's longer-run 2 percent objective. Hence, 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. (See the box "The FOMC's Revised Statement on Longer-Run Goals and Monetary Policy Strategy" in Part 2.)

In addition, in December the FOMC introduced two changes to the Summary of Economic Projections (SEP) intended to enhance the information provided to the public. First, the release of the full set of SEP exhibits was accelerated by three weeks, from the publication of the minutes three weeks after the end of an FOMC meeting to the day of the policy decision, the second day of an FOMC meeting. Second, new charts were included that display how FOMC participants' assessments of uncertainties and risks have evolved over time.

Interest rate policy. In light of the effects of the continuing public health crisis on the economy and the associated risks to the outlook, the FOMC has maintained the target range for the federal funds rate at 0 to ¼ percent since last March. In pursuing the strategy outlined in its revised statement, the Committee noted that it expects it will be appropriate to maintain this target range 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.

Balance sheet policy. With the federal funds rate near zero, the Federal Reserve has also continued to undertake asset purchases to increase 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 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

Disparities in job loss. The COVID-19 crisis has exacerbated pre-existing disparities in labor market outcomes across job types and demographic groups. Job losses last spring were disproportionately severe among lower-wage workers, less-educated workers, and racial and ethnic minorities, as in previous recessions, but also among women, in contrast to previous recessions. While all groups have experienced at least a partial recovery in employment rates since April 2020, the shortfall in employment remains especially large for lower-wage workers and for Hispanics, African Americans, and other minority groups, and the additional childcare burdens resulting from school closures have weighed more heavily on women's labor force participation than on men's labor force participation. (See the box "Disparities in Job Loss during the Pandemic" in Part 1.)

High-frequency indicators. The unprecedented magnitude, speed, and nature of the COVID-19 shock to the economy rendered traditional statistics insufficient for monitoring economic activity in a timely manner. As a result, policymakers turned to nontraditional high-frequency indicators of activity, especially for the labor market and consumer

spending. These indicators presented a more timely and granular picture of the drop and subsequent rebound in economic activity last spring. The most recent readings obtained from those indicators suggest that economic activity began to edge up again in January, likely reflecting in part the disbursement of additional stimulus payments to households. (See the box "Monitoring Economic Activity with Nontraditional High-Frequency Indicators" 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. This discussion presents the policy rate prescriptions from a number of rules that have received attention in the research literature, many of which mechanically prescribe raising the federal funds rate as employment rises above estimates of its longer-run level. A rule that instead responds only to shortfalls of employment from assessments of its maximum level is featured to illustrate one aspect of the FOMC's revised approach to policy, as described in the revised Statement on Longer-Run Goals and Monetary Policy Strategy. (See the box "Monetary Policy Rules and Shortfalls from Maximum Employment" in Part 2.)

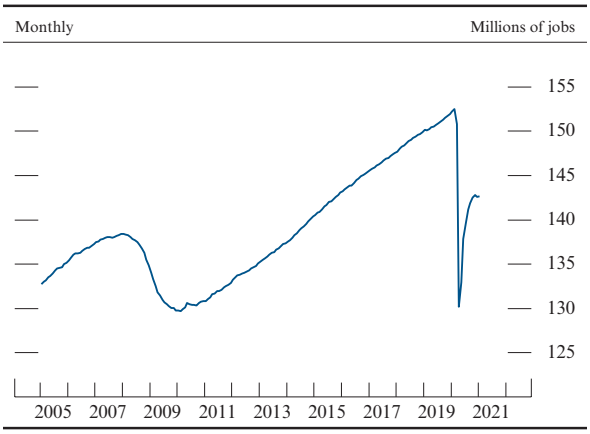
Part 1
Recent Economic and Financial Developments

Domestic Developments

The labor market has partially recovered from the pandemic-induced collapse, but the pace of improvement slowed substantially toward the end of last year…

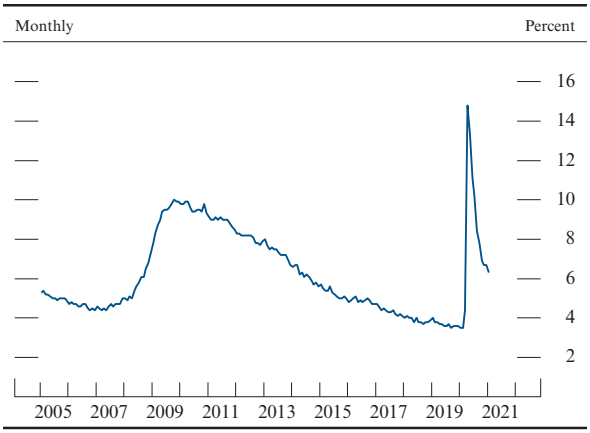
The public health crisis spurred by the spread of COVID-19 weighed on economic activity throughout 2020, and patterns in the labor market reflected the ebb and flow of the virus and the actions taken by households, businesses, and governments to combat its spread. During the initial stage of the pandemic in March and April, payroll employment plunged by 22 million jobs, while the measured unemployment rate jumped to 14.8 percent—its highest level since the Great Depression (figures 1 and 2).[2] As cases subsided and early lockdowns were relaxed, payroll employment rebounded rapidly—particularly outside of the service sectors—and the unemployment rate fell back. Beginning late last year, however, the pace of improvement in the labor market slowed markedly amid another large wave of COVID-19 cases. The unemployment rate declined only 0.4 percentage point from November through January, while payroll gains averaged just 29,000 per month, weighed down by a contraction in the leisure and hospitality sector, which is particularly affected by social distancing and government-mandated restrictions.

1. Nonfarm payroll employment



Source: Bureau of Labor Statistics via Haver Analytics.

2. Civilian unemployment rate



Source: Bureau of Labor Statistics.

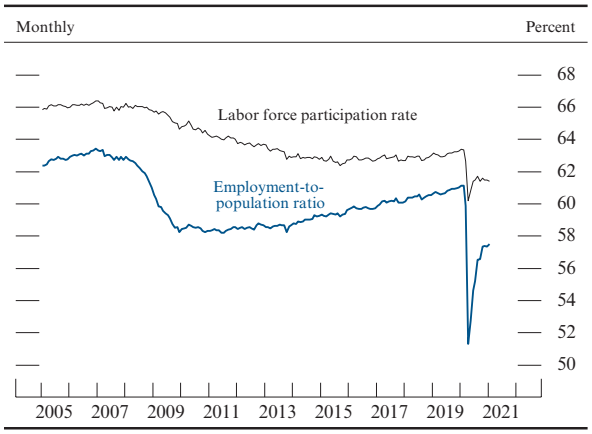
2. Since the beginning of the pandemic, a substantial number of people on temporary layoff, who should be counted as unemployed, have instead been recorded as "employed but on unpaid absence." The Bureau of Labor Statistics reports that, if these workers had been correctly classified, the unemployment rate would have been 5 percentage points higher in April. The misclassification problem has abated since then, and the unemployment rate in January was at most about ½ percentage point lower than it would have been in the absence of misclassification.

All told, the incomplete recovery left the level of employment in January almost 10 million lower than it was a year earlier, while the unemployment rate stood at 6.3 percent—nearly 3 percentage points higher than before the onset of the pandemic. Most recently, high-frequency data—including initial claims for unemployment insurance and weekly employment data from the payroll processor ADP—suggest modest further improvement in the labor market in recent weeks. (For more discussion of what high-frequency indicators are suggesting about the current trajectory of the economy, see the box "Monitoring Economic Activity with Nontraditional High-Frequency Indicators.")

. . . and the harm has been substantial

The damage to the labor market has been even more substantial than is indicated by the extent of unemployment alone. The labor force participation rate (LFPR)—the share of the population that is either working or actively looking for work—plunged in March and April, as many of those who lost their jobs were not seeking work and so were not counted among the unemployed. Despite recovering some over the summer, the LFPR remains nearly 2 percentage points below its pre-pandemic level (figure 3). A number of factors appear to have contributed to the continued weakness in the LFPR, including a lack of job opportunities, the effects of school closings and virtual learning on parents' ability to work, the health concerns of potential workers, and a spate of early retirements triggered by the crisis. All told, the employment-to-population ratio—the share of the population with jobs, regardless of the number seeking work—in January was 3.6 percentage points below the level at the beginning of 2020. Job losses last year fell most heavily on lower-wage workers and on Hispanics, African Americans, and other minority groups. As a result, the rise in unemployment and the decline

3. 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.
SOURCE: Bureau of Labor Statistics via Haver Analytics.

Monitoring Economic Activity with Nontraditional High-Frequency Indicators

The unprecedented magnitude, speed, and nature of the COVID-19 shock to the economy rendered traditional statistics insufficient for monitoring economic activity in a timely manner. As a result, policymakers around the world turned to nontraditional indicators of activity, both those based on private-sector "big data" and those newly developed by official statistical agencies. Because some of the most salient characteristics of these indicators are their timeliness and the time span they cover (such as daily or weekly), they are often called "high-frequency indicators."

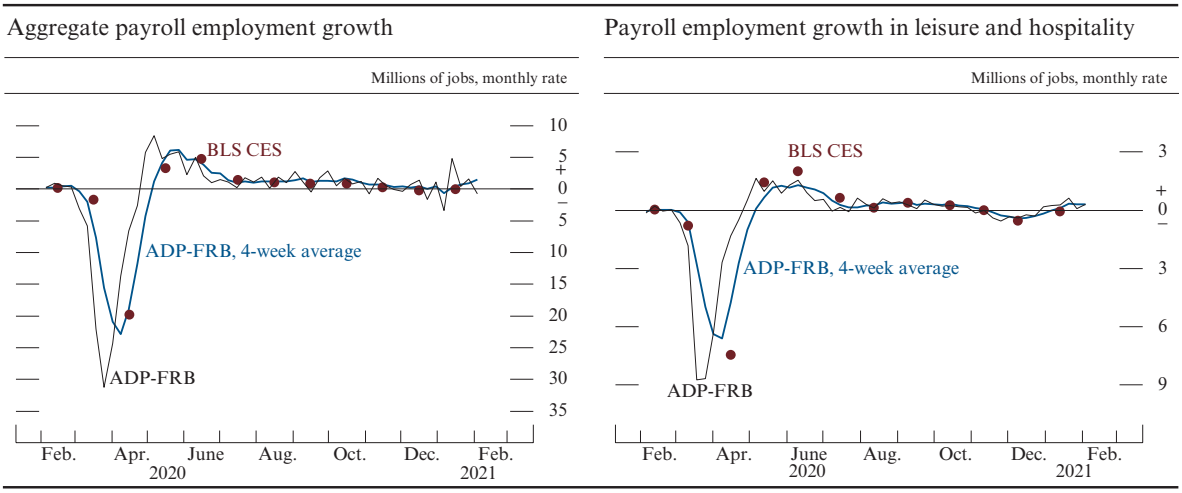
An important example of the usefulness of high-frequency indicators is the case of payroll employment. The Bureau of Labor Statistics' (BLS) monthly measure of payroll employment is one of the most reliable, timely, and closely watched business cycle indicators. However, during the onset of the pandemic in the United States, even the BLS Current Employment Statistics (CES) data were published with too long of a lag to track the dramatic dislocations in the labor market in a timely manner. Specifically, from the second half of March through early April, the economy was shedding jobs at an unprecedented rate, but those employment losses were captured only in the employment situation release issued on May 8, 2020. Because of this lag, economists looked to various private data sources to gain insights about the current state of the labor market.[1] An important example is data from the payroll processor ADP that cover roughly 20 percent of private U.S. employment, a sample size similar to the one used by the BLS to construct the CES. Estimates of changes in employment constructed from ADP data have tracked the official CES data remarkably well since the start of the pandemic recession, and the ADP data possess the important benefits of being available earlier and at a weekly frequency (figure A, left panel).[2]

(continued on next page)

1. See, for example, Raj Chetty, John N. Friedman, Nathaniel Hendren, Michael Stepner, and the Opportunity Insights Team (2020), "The Economic Impacts of COVID-19: Evidence from a New Public Database Built Using Private Sector Data," NBER Working Paper Series 27431 (Cambridge, Mass.: National Bureau of Economic Research, November), https://www.nber.org/papers/w27431; and Alexander W. Bartik, Marianne Bertrand, Feng Lin, Jesse Rothstein, and Matt Unrath (forthcoming), "Measuring the Labor Market at the Onset of the COVID-19 Crisis," *Brookings Papers on Economic Activity*.

2. For further analysis of the ADP employment series, see Tomaz Cajner, Leland D. Crane, Ryan A. Decker, John Grigsby, Adrian Hamins-Puertolas, Erik Hurst, Christopher Kurz, and Ahu Yildirmaz (forthcoming), "The U.S. Labor Market during the Beginning of the Pandemic Recession," *Brookings Papers on Economic Activity*. Note that the ADP employment series referenced in this discussion differ from the ADP National Employment Report, which is published monthly by the ADP Research Institute in close collaboration with Moody's Analytics.

A. Estimates of private payroll employment growth



NOTE: ADP data are weekly and extend through February 6, 2021. BLS data are monthly.

SOURCE: Federal Reserve Board staff calculations using ADP, Inc., Payroll Processing Data; Bureau of Labor Statistics (BLS), Current Employment Statistics (CES).

Monitoring Economic Activity *(continued)*

Weekly employment estimates based on ADP data were particularly valuable not only last spring when employment plummeted and then quickly rebounded, but also during the renewed COVID-19 wave that started this past fall. In particular, high-frequency ADP employment data indicate that the fall and winter virus wave had a smaller effect on the labor market than was seen last spring, likely because there were fewer mandated shutdowns of businesses than in the spring, because many businesses implemented adaptations that made it easier for them to continue to operate (for example, curbside pickup), and because many individuals changed their behavior (for example, by wearing masks such that more economic activities are deemed safer now than in the spring). Most recently, the BLS data show that private payroll employment remained little changed through its survey week in mid-January, and the ADP data indicate that employment improved modestly through early February. Additionally, the latest ADP data indicate that the leisure and hospitality sector—which includes hotels, restaurants, and entertainment venues and is particularly affected by government-mandated restrictions and social distancing—started adding jobs again in recent weeks after experiencing a temporary downturn at the end of last year (figure A, right panel).

Outside of the labor market, several new high-frequency indicators have been useful in monitoring the massive effects of the COVID-19 pandemic on consumer spending. Weekly data from NPD (a market analytics firm) on nonfood retail sales captured in real time the dramatic and sudden drop in consumption in mid-March; the monthly Census Bureau data recorded that decline only with a lag (figure B, left panel).[3] The NPD data also reflected how the income support payments to families, provided by the Coronavirus Aid, Relief, and Economic Security Act, or CARES Act, rapidly affected consumer spending in mid-April. More recently, the NPD data showed some decline in consumption late last year, followed by a pickup in January after the passage of the most recent fiscal stimulus package. Several nontraditional data sources illustrate that services spending remains depressed as social distancing continues to restrain in-person activity (figure B, right panel).[4]

With rapid changes in the economic environment, many statistical agencies also developed high-frequency

(continued)

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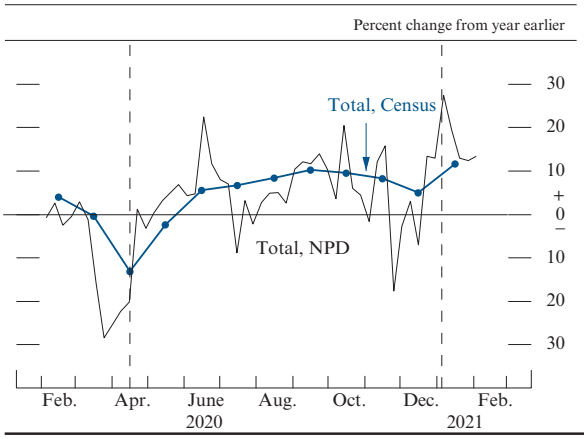
4. Services spending accounts for roughly one-half of aggregate spending, but it is measured with some lag. In particular, the services spending information folded into gross domestic product comes from the revenue information sourced from the Census Bureau's Quarterly Services Survey (QSS). The advance QSS (early data for a subset of industries found in the full QSS) and full QSS are released two and three months, respectively, after a given quarter ends.

B. Indicators of consumption growth

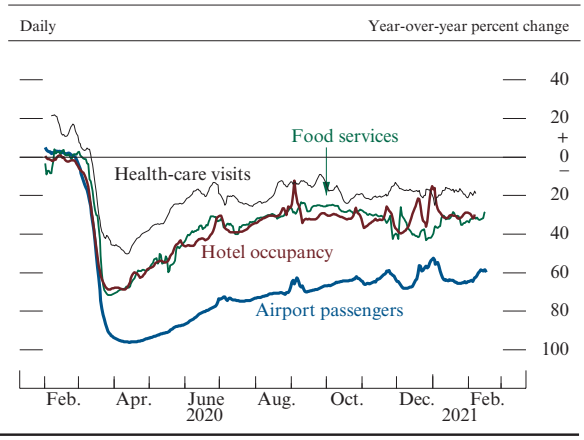
Retail goods spending



NOTE: NPD data are weekly and extend through February 6, 2021, and Census data are monthly. All series show nominal spending on nonfood retail goods. Dashed lines represent the first and second waves of stimulus tranche.

SOURCE: NPD Group; Census Bureau.

Services spending



NOTE: Year-over-year percent change in 7-day moving average. Health-care visits data extend through February 7, 2021; food services data extend through February 15, 2021; and hotel occupancy data extend through February 6, 2021.

SOURCE: SafeGraph, Inc.; Fiserv, Inc.; STR, Inc.; Transportation Security Administration.

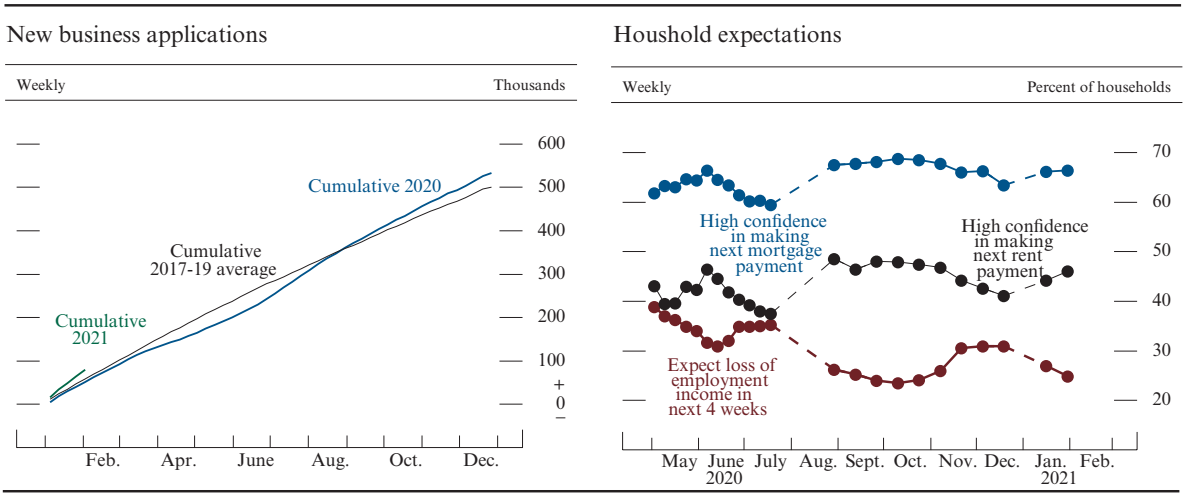
indicators. For example, the Census Bureau released data on weekly new business applications (figure C, left panel). During the initial stage of the pandemic recession, new business applications fell compared with previous years, a typical pattern during economic downturns. However, new business applications started to rebound notably during the summer, and for the year as a whole, they were higher than the average over the previous three years, a pattern that differs dramatically from previous business cycles.[5] The increase in applications appears to be concentrated in industries that rapidly adapted to the landscape of the pandemic, such as online retail, personal services, information technology, and delivery. It remains unclear, however, whether these business applications will lead to actual job creation at the same rate as in the past.[6] As another example, the Census Bureau developed high-frequency survey statistics that contain information about the financial struggles of households (figure C, right panel). These data indicate that the financial stress of households increased late last year as households were becoming less confident about being able to make their next mortgage or rent payment as well as more likely to expect income loss over the next four weeks, but households' financial expectations improved somewhat in January.

Overall, nontraditional high-frequency indicators have served several purposes over the past year. First, they provide timely alternative estimates that complement official statistics and can also be used to verify movements in official statistics. Second, they are often helpful for assessing economic developments more quickly and with greater granularity than what can be found in official statistics. Third, high-frequency indicators without a direct counterpart in official statistics give a different perspective and help enhance our understanding of economic developments. These nontraditional indicators are also subject to several potential limitations, such as systematic biases due to nonrepresentativeness of data or small (and possibly nonrandom) samples. Importantly, only time will tell if such indicators will continue to provide a signal above and beyond traditional indicators as the high-frequency shocks associated with the pandemic dissipate. Overall, however, the use of nontraditional high-frequency indicators over the past year has amply shown that they can yield large benefits, especially when economic conditions are changing rapidly.

5. For further discussion, see Emin Dinlersoz, Timothy Dunne, John Haltiwanger, and Veronika Penciakova (forthcoming), "Business Formation: A Tale of Two Recessions," *American Economic Review Papers and Proceedings*.

6. The link between applications and job creation in the pre-pandemic period is studied in Kimberly Bayard, Emin Dinlersoz, Timothy Dunne, John Haltiwanger, Javier Miranda, and John Stevens (2018), "Early-Stage Business Formation: An Analysis of Applications for Employer Identification Numbers," Finance and Economics Discussion Series 2018-015 (Washington: Board of Governors of the Federal Reserve System, March), https://dx.doi.org/10.17016/FEDS.2018.015.

C. High-frequency indicators by official statistical agencies



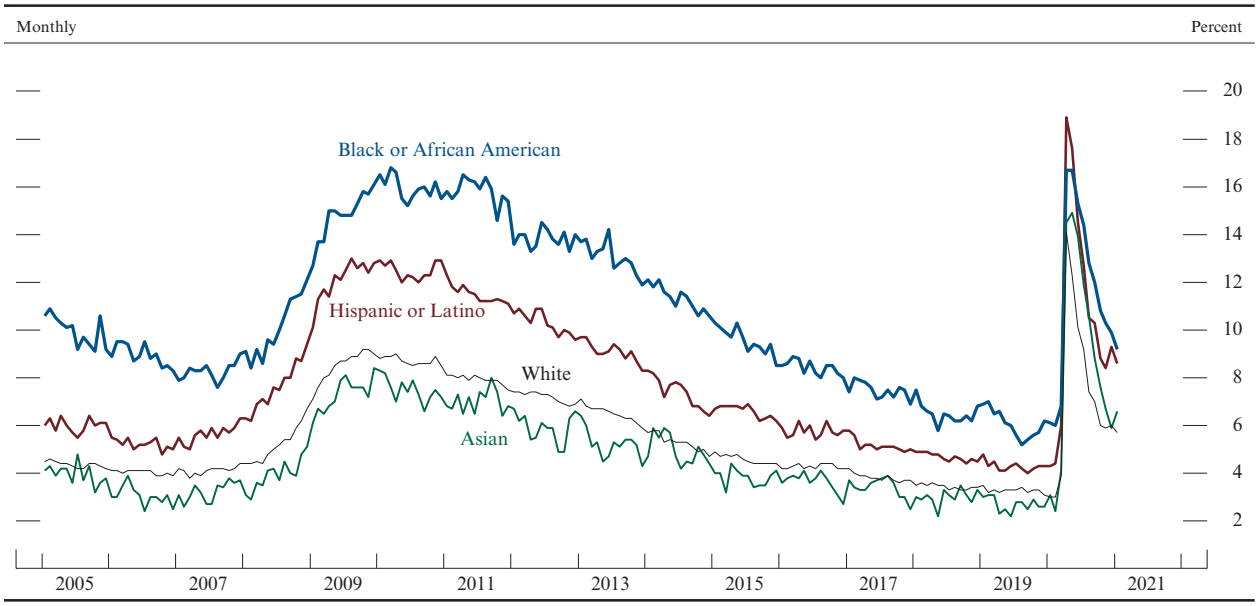
NOTE: The cumulative 2021 data extend through February 6, 2021. The data are derived from Employer Identification Number applications with planned wages.

SOURCE: Business Formation Statistics, Census Bureau via Haver Analytics.

NOTE: Data extend through February 1, 2021. Dashed lines represent pauses in Household Pulse Survey data collection.

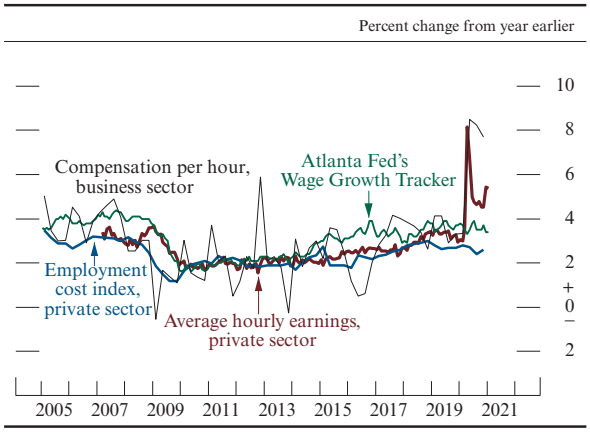
SOURCE: Household Pulse Survey, Census Bureau via Haver Analytics.

4. Unemployment rate, by race and ethnicity



NOTE: Unemployment rate measures total unemployed as a percentage of the labor force. Persons whose ethnicity is identified as Hispanic or Latino may be of any race. 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.

5. Measures of change in hourly compensation



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

in the employment-to-population ratio were particularly evident among those groups (figure 4). (For more discussion of the pandemic's effects on the labor market outcomes of various groups, see the box "Disparities in Job Loss during the Pandemic.")

Aggregate wage growth appears to be little changed despite the weakness in the labor market

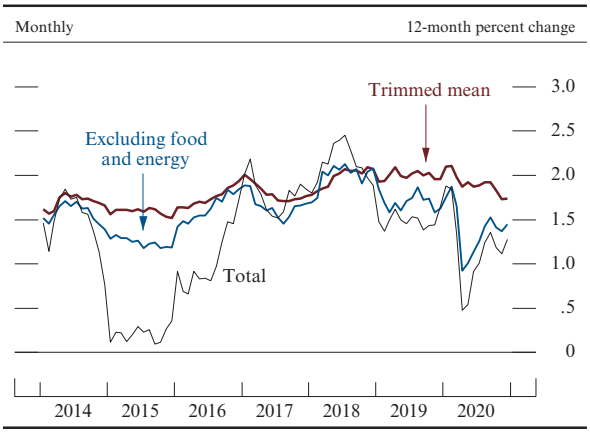
Although weakness in the labor market generally puts downward pressure on overall wages, the best available measures suggest that wage growth in 2020 was little changed from 2019. Total hourly compensation as measured by the employment cost index, which includes both wages and benefits, rose 2.6 percent during the 12 months ending in December, only slightly below pre-pandemic rates (figure 5). Wage growth as computed by the Federal Reserve Bank of Atlanta, which tracks the median 12-month wage growth of individuals responding to the Current Population Survey, was about 3½ percent

during 2020, similar to the growth rate in 2019.[3] The continued gains in aggregate wages mask important heterogeneity, however; according to the Atlanta Fed data, workers with lower earnings and nonwhites experienced larger decelerations in wages than other groups last year.

Price inflation remains low despite rebounding since last spring

As measured by the 12-month change in the price index for personal consumption expenditures (PCE), inflation fell from 1.6 percent in December 2019 to a low of 0.5 percent in April, as economic activity dropped sharply (figure 6). Since then, inflation has partially recovered along with the pickup in demand, but it was only 1.3 percent in December—still well below the Federal Open Market Committee's (FOMC) objective of 2 percent. After excluding consumer food and energy prices, which are often quite volatile, the 12-month measure of core PCE inflation was 1.5 percent in December. An alternative way to abstract from transitory influences on measured inflation is provided by the trimmed mean measure of PCE price inflation constructed by the Federal Reserve Bank of Dallas.[4] The 12-month change in this measure declined to 1.7 percent in December

6. Change in the price index for personal consumption expenditures



NOTE: The data extend through December 2020.
SOURCE: For trimmed mean, Federal Reserve Bank of Dallas; for all else, Bureau of Economic Analysis; all via Haver Analytics.

3. Some other common wage measures are providing misleading signals at present because they are dominated by compositional effects: Pandemic-related job losses fell most heavily on lower-wage workers, which mechanically increased measures of average wages. For example, average hourly earnings from the payroll survey rose more than 5 percent over the 12 months ending in January. Similarly, the fourth-quarter reading on compensation per hour, which includes both wages and benefits, was 7.7 percent above its year-ago level. Output per hour, or productivity, has also been affected by the same composition effects, rising 2.5 percent over the four quarters of 2020, the fastest pace in a decade.

4. The trimmed mean price index excludes whichever prices showed the largest increases or decreases in a given month. Over the past 20 years, changes in the trimmed mean index have averaged ¼ percentage point above core PCE inflation and 0.1 percentage point above total PCE inflation.

Disparities in Job Loss during the Pandemic

Although employment has improved substantially since its trough in April 2020, the labor market recovery remains far from complete: As of January 2021, the employment-to-population (EPOP) ratio, a broad measure that encompasses both increased unemployment and decreased labor force participation, was still 3.6 percentage points below its February 2020 level. All industries, occupations, and demographic groups experienced significant employment declines at the start of the pandemic, and, over the ensuing months, all groups have experienced at least some partial recovery. That said, employment declines last spring were steeper for workers with lower earnings and for Hispanics, African Americans, and other minority groups, and the hardest-hit groups still have the most ground left to regain.

Although disparities in labor market outcomes generally widen during recessions, certain factors unique to this episode—in particular, the social-distancing measures taken by households, businesses, and governments to limit in-person interactions—have profoundly shaped the incidence of recent job losses in different segments of the labor market. Because jobs differ in the degree to which they involve personal contact and physical proximity, in whether they can be performed remotely, and in whether they are deemed to serve "essential" functions, social-distancing measures have had disparate effects across industries and occupations. To illustrate this point, figure A reports net changes in employment in 11 broad industry categories, both during the period of acute job losses last spring (column 1) and over the longer interval since the start of the pandemic (column 2). Net job losses through January have been especially severe in the leisure and hospitality industry—in which employment is still 22.9 percent below pre-pandemic levels (line 11)—and in other services, a category that includes barber shops and beauty salons (line 12).[1] By contrast, employment in most other broad industries is now 5 percent or less below pre-pandemic levels. Job losses have thus been disproportionately concentrated in lower-wage consumer service industries, in which business operations are strongly affected by social-distancing measures and relatively few workers are able to work from home.[2]

A. Changes in private-sector employment, by industry

Industry	Percent change since Feb. 2020	
	(1) As of Apr. 2020	(2) As of Jan. 2021
1. Total private	−16.5	−6.6
2. Mining and logging	−9.9	−11.7
3. Manufacturing	−10.8	−4.5
4. Construction	−14.6	−3.3
5. Wholesale trade	−6.9	−4.5
6. Retail trade	−15.2	−2.5
7. Transp., warehousing, and utilities	−9.1	−2.7
8. Information and financial activities	−4.8	−2.8
9. Professional and business services	−11.1	−3.8
10. Education and health services	−11.6	−5.4
11. Leisure and hospitality	−48.6	−22.9
12. Other services	−23.7	−7.8

NOTE: The data are seasonally adjusted.
SOURCE: Bureau of Labor Statistics.

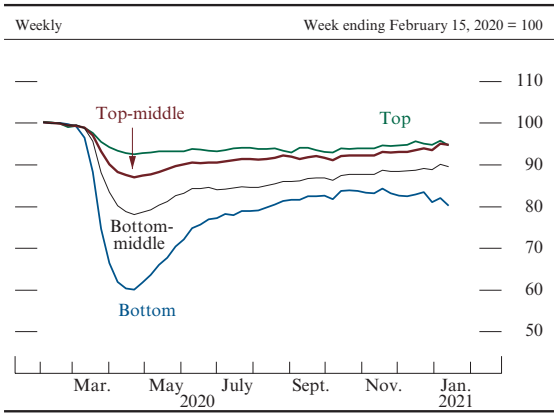
In keeping with the sectoral composition of recent job losses, workers in lower-wage jobs have been hit especially hard. Figure B uses data from the payroll processor ADP to plot employment indexes for four job tiers defined by hourly wages. Between February and April of last year, employment fell most sharply for jobs in the bottom quartile of the pre-pandemic wage distribution. Between April and June, employment rose most quickly for these lowest-paying jobs. In subsequent months, job gains moderated substantially for all groups, and as of mid-January, employment in the lowest-paying jobs was about 20 percent below its

(continued)

1. Net job losses have also been pronounced in mining and logging (line 2), which is unique among these industries in having experienced further contraction in employment between April 2020 and January 2021.

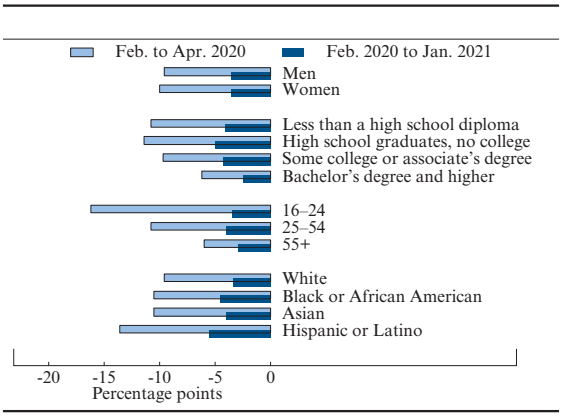
2. For instance, in the January 2021 round of the Current Population Survey, 41 percent of those employed in the professional and business services industry reported working from home during the previous four weeks as a result of the pandemic, compared with about 7 percent of those employed in leisure and hospitality. See Bureau of Labor Statistics (2021), "Supplemental Data Measuring the Effects of the Coronavirus (COVID-19) Pandemic on the Labor Market," Current Population Survey, January, https://www.bls.gov/cps/effects-of-the-coronavirus-covid-19-pandemic.htm.

B. Employment declines for low-, middle-, and high-wage workers



NOTE: The data are seasonally adjusted by the Federal Reserve Board and extend through January 16, 2021. Wage quartiles are defined using the February 2020 wage distribution.
SOURCE: Federal Reserve Board staff calculations using ADP, Inc., payroll processing data.

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



NOTE: The data are seasonally adjusted. 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.

pre-pandemic level. In comparison, employment in the higher-paying job tiers is now about 10 percent or less below pre-pandemic levels.

Similar disparities are apparent across demographic groups. Figure C shows the change in each group's EPOP ratio. Between February 2020 and January 2021, the EPOP ratio fell by a similar amount for both men and women; in contrast, during many previous recessions the EPOP ratio declined substantially more for men. (In fact, given that men's employment rate was substantially higher than women's before the pandemic, the decline in employment for women as a percentage of pre-recession employment has been larger, which contrasts even more starkly with previous recessions.) Since February 2020, the EPOP ratio has fallen more for people without a bachelor's degree than for those with at least a bachelor's degree, more for prime-age individuals than for those under age 25 or over age 55, and more for Hispanics, African Americans, and Asians than for whites.[3] In general, the groups experiencing the largest declines in employment since last February are more commonly employed in the industries that have experienced the greatest net employment declines to date, such as leisure and hospitality; these demographic groups are also less likely to report being able to work from home.[4]

(continued on next page)

3. The decline in employment also appears to have been relatively large for Native Americans, based on annual average data for 2020. (Monthly data are not available for this group because of small sample sizes and are not shown in figure C for that reason.)

4. For more information on the groups with the largest employment declines since February 2020, see Kenneth A. Couch, Robert W. Fairlie, and Huanan Xu (2020), "Early Evidence of the Impacts of COVID-19 on Minority Unemployment," *Journal of Public Economics*, vol. 192 (December), pp. 1–11; Guido Matias Cortes and Eliza C. Forsythe (2020), "The Heterogeneous Labor Market Impacts of the Covid-19 Pandemic," Upjohn Institute Working Paper Series 20-327 (Kalamazoo, Mich.: W.E. Upjohn Institute for Employment Research, May), https://research.upjohn.org/cgi/viewcontent.cgi?article=1346&context=up_workingpapers; and Titan Alon, Matthias Doepke, Jane Olmstead-Rumsey, and Michèle Tertilt (2020), "This Time It's Different: The Role of Women's Employment in a Pandemic Recession," NBER Working Paper 27660 (Cambridge, Mass.: National Bureau of Economic Research, August), https://www.nber.org/papers/w27660.

Additional details on differences across demographic groups in the ability to work from home can be found in the Current Population Survey. For example, in January, around 23 percent of white workers reported working from home in the previous four weeks because of the pandemic, compared with 19 percent of African Americans and 14 percent of Hispanics; 43 percent of those with a bachelor's degree or higher reported working from home, compared with 16 percent or less for those with lower levels of education. See Bureau of Labor Statistics, "Supplemental Data," in box note 2.

Disparities in Job Loss *(continued)*

Since the start of the pandemic, another important impediment to individuals' ability to work or look for work has been the absence of in-person education for many K–12 students.[5] Because many working parents are unable to work from home while monitoring their children's virtual education (depending on the nature of their jobs and the availability of other caregivers), the widespread lack of K–12 in-person education may also explain some of the differences across groups. For example, among mothers aged 25 to 54 with children aged 6 to 17, the fraction who said they are not working or looking for work for caregiving reasons was 2½ percentage points higher in the three months ending January 2021 than over the year-earlier period, compared with a ½ percentage point increase for fathers. Relative to white mothers, the increase was about twice as large for Hispanic mothers and more than twice as large for African American mothers, and it was also more than twice as large for mothers without any college education as for mothers with more education.[6]

As the spread of COVID-19 is contained and a growing share of the population is immunized, some of the unique factors that have exacerbated disparities since the start of the pandemic will likely ease. For example, as COVID becomes less prevalent, businesses offering in-person services (for example, in the leisure and hospitality industry) will move closer to pre-pandemic levels of employment. In addition, as more schools return to offering in-person education, childcare constraints will become less acute.

Even as labor market impediments specific to the pandemic subside, however, the speed at which the labor market moves toward full employment will be important for narrowing the disparities that have widened since the start of the pandemic, as research has consistently shown that strong labor markets especially benefit lower-wage and disadvantaged workers.[7] The pace of labor market gains will also depend on how many unemployed workers have the opportunity to return to their original jobs. In January 2021, 2.2 percent of labor force participants (representing 34.6 percent of unemployed workers) reported being unemployed because of a permanent job loss, up from 1.3 percent of the labor force (8.8 percent of unemployed workers) in April 2020.[8] Research has shown that workers who return to their previous employers after a temporary layoff tend to earn wages similar to what they were making previously, whereas laid-off workers who do not return to their previous employer experience a longer-lasting decline in earnings.[9]

5. According to the Census Bureau's Household Pulse Survey, 85 percent of parents surveyed in early January reported that their children's classes for the 2020–21 school year were moved to virtual learning.

6. The findings are Federal Reserve Board staff estimates based on publicly available Current Population Survey microdata.

7. For example, see Stephanie R. Aaronson, Mary C. Daly, William L. Wascher, and David W. Wilcox (2019), "Okun Revisited: Who Benefits Most from a Strong Economy?" *Brookings Papers on Economic Activity*, Spring, pp. 333–75, https://www.brookings.edu/wp-content/uploads/2019/03/aaronson_web.pdf; and Tomaz Cajner, Tyler Radler, David Ratner, and Ivan Vidangos (2017), "Racial Gaps in Labor Market Outcomes in the Last Four Decades and over the Business Cycle," Finance and Economics Discussion Series 2017-071 (Washington: Board of Governors of the Federal Reserve System, June), https://dx.doi.org/10.17016/FEDS.2017.071.

8. The data are Federal Reserve Board staff calculations from published Bureau of Labor Statistics estimates. By comparison, the number of permanent job losers peaked at 4.4 percent of labor force participants (representing 44.8 percent of unemployed workers) during the Great Recession.

9. See Louis S. Jacobson, Robert J. LaLonde, and Daniel G. Sullivan (1993), "Earnings Losses of Displaced Workers," *American Economic Review*, vol. 83 (September), pp. 685–709; Shigeru Fujita and Giuseppe Moscarini (2017), "Recall and Unemployment," *American Economic Review*, vol. 107 (December), pp. 3875–916; and Marta Lachowska, Alexandre Mas, and Stephen A. Woodbury (2020), "Sources of Displaced Workers' Long-Term Earnings Losses," *American Economic Review*, vol. 110 (October), pp. 3231–66.

from 2 percent a year earlier, a similar decrease to those in total and core PCE inflation.

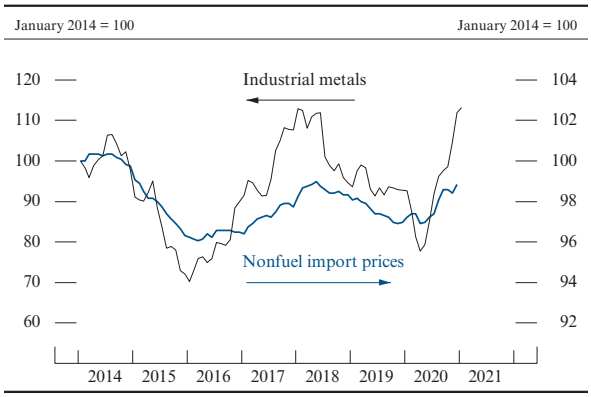
The low level of consumer price inflation in 2020 partly reflected the deterioration in economic activity. For example, inflation in tenants' rent and owners' equivalent rent, which tend to be sensitive to overall economic conditions, softened in 2020 from the rates observed during the preceding few years. Low inflation also reflected the net effect of a number of pandemic-driven shifts in specific sectors of the economy, such as a decline in gasoline prices that resulted from a collapse in oil prices in the early part of the year, which only partially reversed in the second half. Similarly, airfares and hotel prices fell markedly, driven by huge reductions in demand due to the pandemic. In contrast, food prices increased at an unusually fast pace last year, given stronger demand at retail grocery stores and, at times, some pandemic-related supply chain disruptions. In addition, prices for some durable goods, such as motor vehicles and home appliances, rose sharply during the summer and remained somewhat elevated at the end of the year, in part because of a pandemic-induced shift in demand away from services and toward these goods.

Prices of imports and oil have also rebounded

The partial rebound in inflation later in 2020 also stemmed from a firming of import prices. After declining in the first half of last year, nonfuel import prices increased in the second half, as the dollar depreciated and the recovery in global demand put upward pressure on non-oil commodity prices—a substantial component of nonfuel import prices (figure 7). Prices of both agricultural commodities and industrial metals increased considerably, and nonfuel import prices are now higher than they were a year ago.

Early in the pandemic, benchmark oil prices fell below $20 per barrel, a level not breached since 2002. While prices have now nearly

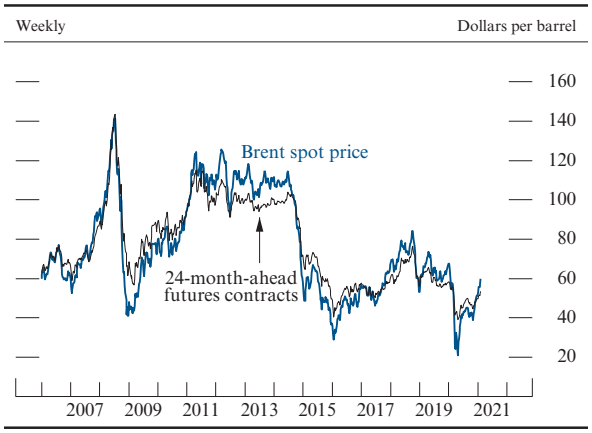
7. Nonfuel import prices and industrial metals indexes



NOTE: The data for nonfuel import prices are monthly and extend through December 2020. The data for industrial metals are monthly averages of daily data and extend through January 29, 2021.

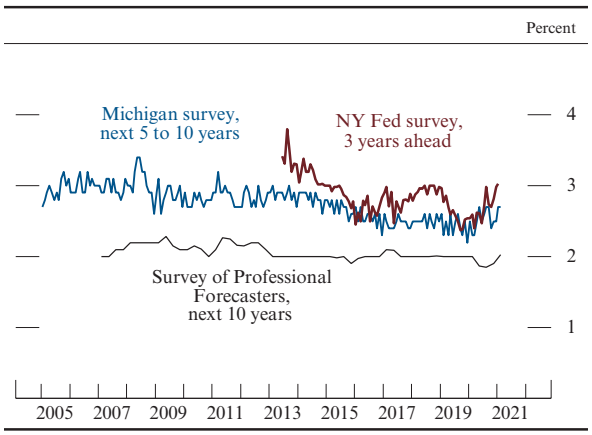
SOURCE: For nonfuel import prices, Bureau of Labor Statistics; for industrial metals, S&P GSCI Industrial Metals Spot Index via Haver Analytics.

8. Spot and futures prices for crude oil



NOTE: The data are weekly averages of daily data. The data begin on Thursdays and extend through February 10, 2021.
SOURCE: ICE Brent Futures via Bloomberg.

9. Surveys of inflation expectations



NOTE: The series are medians of the survey responses. The Michigan survey data are monthly and extend through February 2021; the February data are preliminary. The Survey of Professional Forecasters data for inflation expectations for personal consumption expenditures are quarterly, begin in 2007:Q1, and extend through 2021:Q1. The NY Fed survey data are monthly and begin in June 2013.
SOURCE: University of Michigan Surveys of Consumers; Federal Reserve Bank of New York, Survey of Consumer Expectations; Federal Reserve Bank of Philadelphia, Survey of Professional Forecasters.

recovered, oil consumption and production are still well below pre-pandemic levels (figure 8). Although global economic activity has picked up since last spring, oil demand has not fully recovered, held back by the slow recovery in travel and commuting. Weak demand has been met by reductions in supply: U.S. production has fallen dramatically relative to a year ago, while OPEC (Organization of the Petroleum Exporting Countries) and Russia have only slightly increased production after making sharp cuts last spring.

Survey-based measures of long-run inflation expectations have been broadly stable . . .

Despite the volatility in actual inflation last year, survey-based measures of inflation expectations at medium- and longer-term horizons, which likely influence actual inflation by affecting wage- and price-setting decisions, have been little changed on net (figure 9). In the University of Michigan Surveys of Consumers, the median value for inflation expectations over the next 5 to 10 years was 2.7 percent in January and early February. In the Survey of Consumer Expectations, conducted by the Federal Reserve Bank of New York, the median of respondents' expected inflation rate three years ahead was 3.0 percent in January, somewhat above its year-earlier level. Finally, in the first-quarter Survey of Professional Forecasters, conducted by the Federal Reserve Bank of Philadelphia, the median expectation for the annual rate of increase in the PCE price index over the next 10 years was 2.0 percent, close to the level around which it had typically hovered in previous years.

. . . and market-based measures of inflation compensation have retraced earlier declines

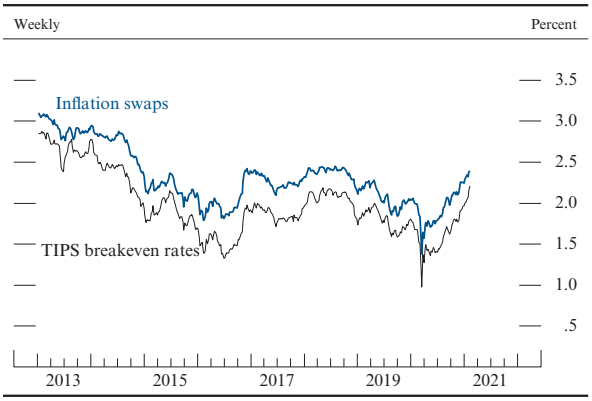
Inflation expectations can also be inferred from market-based measures of inflation compensation, although the inference is not straightforward because these measures are affected by changes in premiums that provide compensation for bearing inflation

and liquidity risks. Measures of longer-term inflation compensation—derived either from differences between yields on nominal Treasury securities and those on comparable-maturity Treasury Inflation-Protected Securities (TIPS), or from inflation swaps—dropped sharply last March, partly reflecting a reduction in the relative liquidity of TIPS compared with nominal Treasury securities (figure 10). Both measures rebounded in the next couple of months as liquidity improved, before drifting up further through the remainder of 2020 and early 2021. The TIPS-based measure of 5-to-10-year-forward inflation compensation and the analogous measure from inflation swaps are now about 2¼ percent and 2½ percent, respectively, a bit above the average levels seen in 2019.[5]

The plunge and rebound in gross domestic product reflected unusual patterns of spending during the pandemic

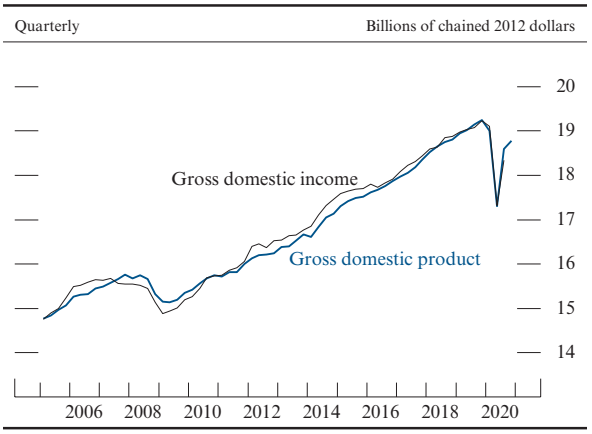
After contracting with unprecedented speed and severity in the first half of 2020, gross domestic product (GDP) rose rapidly in the third quarter and continued to pick up, albeit at a much slower pace, in the fourth quarter (figure 11). The rebound in activity reflected a relaxation of voluntary and mandatory social distancing, as well as unprecedented fiscal and monetary support. Nevertheless, the recovery remains incomplete: At the end of 2020, GDP was 2.5 percent below its level four quarters earlier. This incomplete recovery reflected weakness in services consumption and overall exports that resulted largely from ongoing social-distancing measures to contain the virus, both at home and abroad. The concentration of the recession in services is unprecedented in the United States. Indeed, the sectors that are typically responsible for the cyclical dynamics of GDP have shown remarkable resilience: Activity in the housing market and consumer spending on goods were both above their

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



NOTE: The data are weekly averages of daily data and extend through February 12, 2021. TIPS is Treasury Inflation-Protected Securities.
SOURCE: Federal Reserve Bank of New York; Barclays; Federal Reserve Board staff estimates.

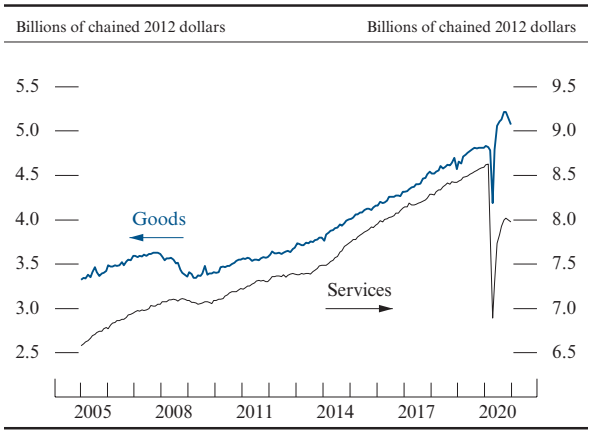
11. Real gross domestic product and gross domestic income



NOTE: Gross domestic income extends through 2020:Q3.
SOURCE: Bureau of Economic Analysis via Haver Analytics.

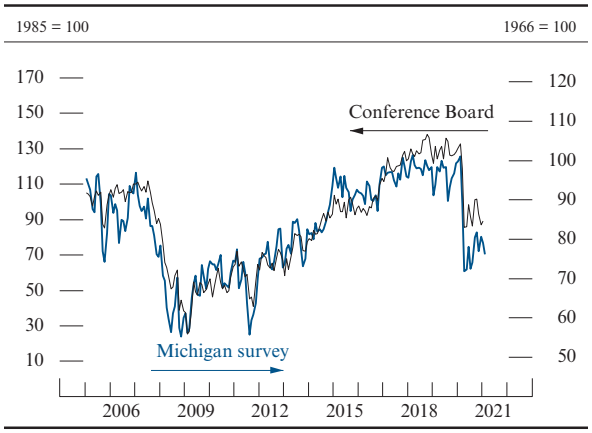
5. As these measures are based on consumer price index (CPI) inflation, one should probably subtract about ¼ percentage point—the average differential between CPI and PCE inflation over the past two decades—to infer inflation compensation on a PCE basis.

12. Real personal consumption expenditures



NOTE: The data are monthly and extend through December 2020.
SOURCE: Bureau of Economic Analysis via Haver Analytics.

13. Indexes of consumer sentiment



NOTE: The data are monthly. Michigan survey data extend through February 2021; the February data are preliminary.
SOURCE: University of Michigan Surveys of Consumers; Conference Board.

pre-pandemic levels in the fourth quarter, and business fixed investment and manufacturing output also recovered rapidly from their initial plunges.

Consumer spending, particularly on goods, bounced back in the second half of 2020 . . .

Household consumption rebounded rapidly during the late spring and summer from its COVID-induced plunge, and it continued to make gains through the fourth quarter, ending the year 2.6 percent below its year-earlier level. Notably, purchases of both durable and nondurable goods rose above their pre-COVID levels in the second half of 2020, as spending shifted away from services curtailed by voluntary and mandatory social distancing (figure 12). Within durable goods, sales of light motor vehicles moved up quickly in the second half and are now close to their pre-pandemic level; any residual weakness in sales may be attributable to low supply, as production has failed to keep pace with demand. Services spending also rebounded from the extraordinarily low level seen in April, but it remained well below its pre-pandemic pace through the fourth quarter, as concerns about the virus continued to limit in-person interactions. Notably, consumer sentiment has also remained well below pre-pandemic levels (figure 13).

. . . assisted by government income support . . .

Consumer spending has been bolstered by government income support in the form of unemployment insurance and stimulus measures targeted at households. These payments were largest in the spring and summer of last year, but even in the fourth quarter aggregate real disposable personal income (DPI) was 3.7 percent above the level prevailing in late 2019, despite the low level of employment.[6] The still-elevated level of DPI,

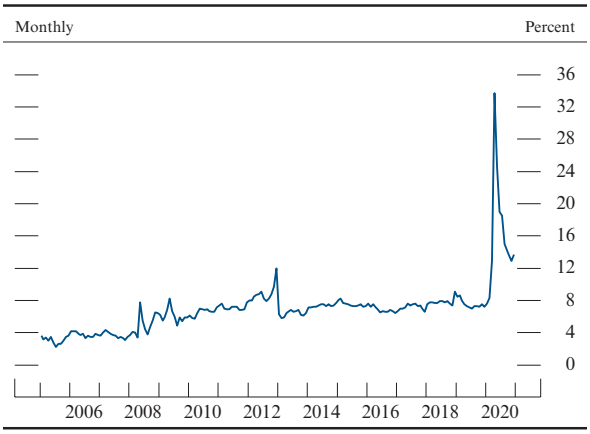
6. The Consolidated Appropriations Act, 2021, which was enacted in late December, should provide a

combined with the low level of consumption, resulted in an aggregate saving rate of more than 13 percent in the fourth quarter, nearly double its level from a year earlier (figure 14).[7] 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.[8]

. . . but spending fell back late in the year

As COVID cases began rising again in November, some states retightened restrictions, and many households likely cut back voluntarily on their activities, leading to a retrenchment in spending on services such as restaurants and travel. Spending on durable goods also stepped down late in the fourth quarter, possibly in part because many households had already purchased durable items such as furniture and electronics earlier in the year. Further, while higher-income households accrued substantial savings over the course of 2020, some lower-income consumers likely began to reduce their spending toward the end of the year, as support provided by the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) waned. More recently, however, retail sales data and high-frequency indicators suggest that consumer spending

14. Personal saving rate



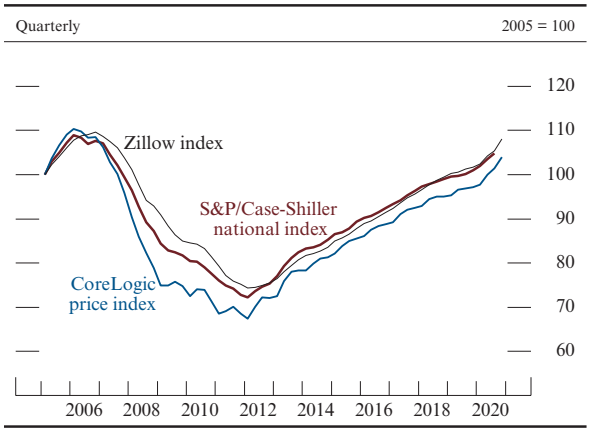
NOTE: The data extend through December 2020.
SOURCE: Bureau of Economic Analysis via Haver Analytics.

substantial further boost to DPI in the first quarter of this year.

7. The saving rate reached 26 percent in the second quarter of 2020—by far the highest level since World War II—before falling back as consumption rebounded and government transfers declined over the course of the year. Even so, the saving rate in the fourth quarter remained higher than in any other period since the 1970s.

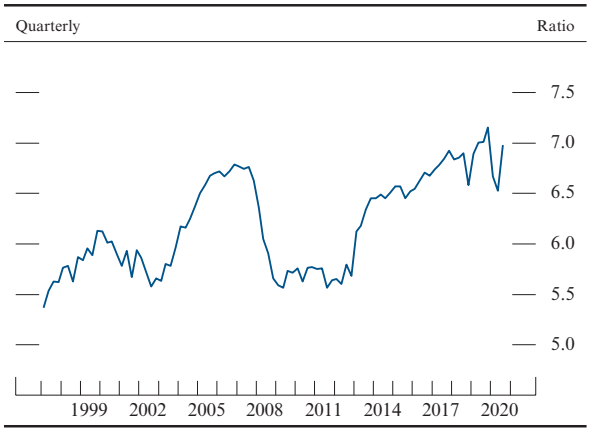
8. Food pantries saw a significant increase in demand in 2020, and there was a sharp increase in the number of families reporting that they did not have sufficient money to buy food. See, for example, Marianne Bitler, Hilary W. Hoynes, and Diane Whitmore Schanzenbach (2020), "The Social Safety Net in the Wake of COVID-19," NBER Working Paper Series 27796 (Cambridge, Mass.: National Bureau of Economic Research, September), https://www.nber.org/system/files/working_papers/w27796/w27796.pdf.

15. Real prices of existing single-family houses



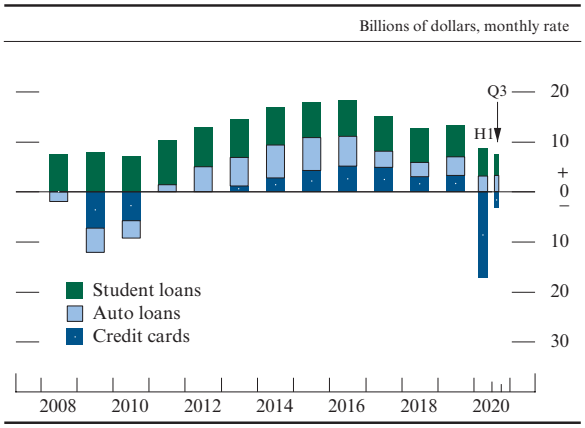
NOTE: The data for the S&P/Case-Shiller index extend through 2020:Q3. Series are deflated by the personal consumption expenditure price index.
SOURCE: CoreLogic Home Price Index; Zillow; S&P/Case-Shiller U.S. National Home Price Index. The S&P/Case-Shiller index is a product of S&P Dow Jones Indices LLC and/or its affiliates. (For Dow Jones Indices licensing information, see the note on the Contents page.)

16. Wealth-to-income ratio



NOTE: The series is the ratio of household net worth to disposable personal income. Data extend through 2020:Q3.
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.

17. Consumer credit flows



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

rose appreciably in January, likely in part because of additional fiscal support from the Consolidated Appropriations Act, 2021, which was enacted in late December.

Soaring equity and house prices have pushed aggregate household wealth to record highs

Stock markets rallied after plunging in the spring and, more recently, have reached record highs, largely reflecting the arrival of effective vaccines, optimism about further fiscal stimulus, and notable improvement in the outlook for corporate earnings. House prices—which are of particular importance for the value of assets held by many households—have also soared, boosted by strong demand from record-low mortgage rates, a shift in demand from multifamily to single-family homes during the pandemic, and a shortage of inventory (figure 15). As a result, aggregate household wealth is elevated relative to income, which is supporting consumption, particularly of relatively well-off households (figure 16).

Lending standards for households are less accommodative than before the pandemic, but credit is still available to households with good credit profiles

Consumer lending standards remain less accommodative than before the pandemic, on balance, and are particularly tight for individuals with low credit ratings. Banks tightened lending standards substantially in the first half of 2020, but the tightening moderated in the second half and credit remains available to higher-score borrowers. Banks also reported considerably weaker demand for consumer credit on balance. Credit card lending volumes have been weak, consistent with the incomplete recovery in overall consumer spending, but auto lending has been stronger amid the rapid recovery in motor vehicle sales to consumers (figure 17). Mortgage lending has also been robust, boosted both by record-low mortgage interest rates and by mortgage credit that is generally available to those with good credit scores who are seeking traditional mortgage

products (figure 18). Overall, loan defaults have remained low despite the weak labor market, supported by various forbearance programs.

The housing sector made a remarkable recovery in the second half of 2020 . . .

Residential investment grew at a robust pace of 14 percent over the four quarters of 2020, as booming home sales and housing construction in the second half more than offset the outsized declines in the second quarter that resulted from the COVID-19 outbreak and mitigation efforts. Historically low mortgage rates and the swift adaptation of the real estate sector to the pandemic boosted housing activity later in the year, with both single-family housing starts and existing home sales rising to their highest levels since the mid-2000s (figures 19 and 20).[9] The burst of housing demand has left inventories of both new and existing homes at all-time lows, putting upward pressure on home prices and supporting new construction. Some of these patterns in the data likely reflect changes in preferences during the pandemic, with households opting for larger homes and housing in less dense areas, but the degree to which these changes will persist remains unclear.

. . . and business fixed investment also rebounded rapidly . . .

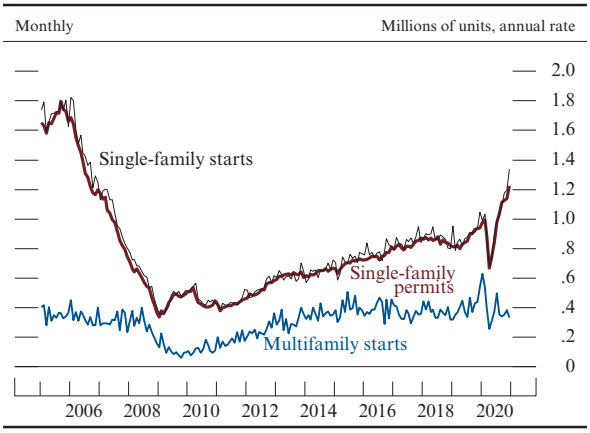
Business fixed investment—that is, private expenditures for equipment, structures, research and development, and other intellectual property—contracted sharply in the first half of 2020 but largely retraced its decline in the second half. The recovery in business investment has been centered in equipment and intellectual property, which rose 2.4 percent over the four quarters of 2020, supported by stronger business sentiment, improved financing conditions, and the

9. In particular, during the pandemic, the real estate sector has made increased use of virtual tours, remote closings, and waivers on inspections and appraisals.

18. Mortgage rates

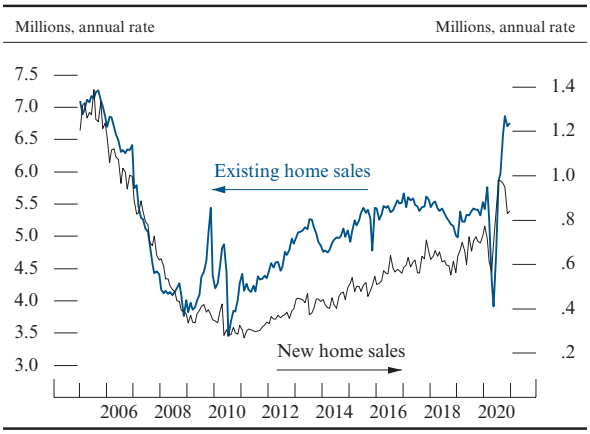
NOTE: The data extend through February 11, 2021.
SOURCE: Freddie Mac Primary Mortgage Market Survey.

19. Private housing starts and permits



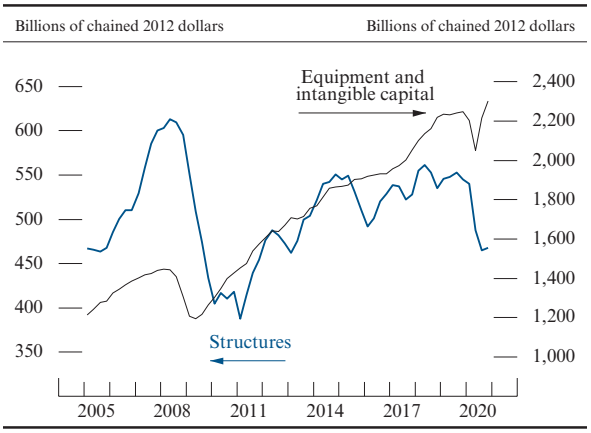
NOTE: The data extend through December 2020.
SOURCE: Census Bureau via Haver Analytics.

20. New and existing home sales



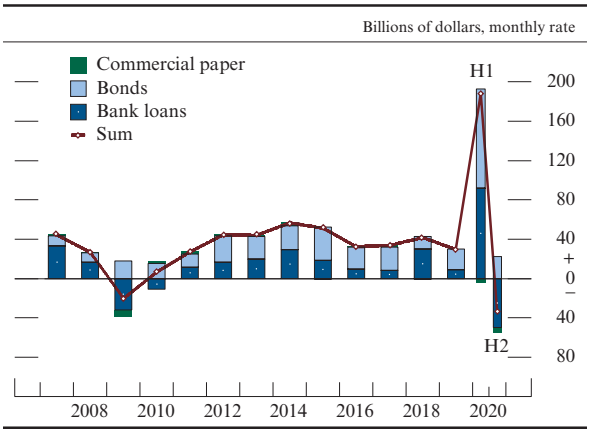
NOTE: Data are monthly and extend through December 2020. New home sales include only single-family sales. Existing home sales include single-family, condo, and co-op sales.
SOURCE: For new home sales, Census Bureau; for existing home sales, National Association of Realtors; all via Haver Analytics.

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.

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.)

unwinding of direct disruptions from social distancing (figure 21). In addition, the health crisis and the shift to widespread teleworking have led to a surge in investment in both medical equipment and computers. In contrast, investment in nonresidential structures continued to decline sharply in the second half. Drilling investment was particularly hard hit and fell 30 percent in 2020 as a result of declines in energy demand and oil prices. Investment in nondrilling structures also fell, although more moderately. Long build times imply that the decline in new construction projects started in the first half of 2020 led to less ongoing spending in the second half; moreover, firms likely remain uncertain about future demand for many types of structures in the wake of the pandemic.

. . . amid notable improvements in corporate financing conditions

Financing conditions for nonfinancial firms through capital markets have improved notably since June. In particular, interest rates have remained very low and corporate bond spreads have narrowed. Gross issuance of nonfinancial corporate bonds was solid in the second half of the year, although it slowed from the exceptional pace in the second quarter (figure 22). In contrast, aggregate bank lending to businesses contracted in the second half, reflecting lower demand for new loans, the repayment of outsized draws on credit lines earlier this year, the forgiveness of some loans under the Paycheck Protection Program, and tighter bank credit standards. In part because of policy actions to foster smooth market functioning, corporations have been able to take advantage of favorable funding conditions in capital markets to refinance debt and bolster their balance sheets; as a result, corporate cash holdings are at record levels. In the small business sector, privately financed lending also picked up over the summer, and loan performance improved, supported by the Paycheck Protection Program. Nevertheless,

credit availability for small businesses remains fairly tight, demand for such credit is weak, and default risk is still elevated.

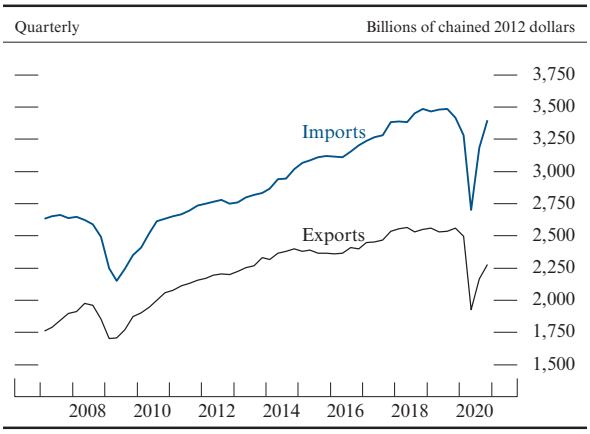
Exports remain lower, but imports have recovered

U.S. exports remain well below pre-pandemic levels. With many foreign economies still weak, U.S. exports of goods have not quite fully recovered from their earlier sharp declines, while exports of services remain depressed because of the continued suspension of most international travel. In contrast, imports have regained most of their lost ground. Reduced imports of services have been offset by a full rebound of goods imports, which reflects strong U.S. demand for household goods (figure 23). Both the nominal trade deficit and current account deficit, relative to GDP, widened since 2019 (figure 24).

Federal fiscal stimulus provided substantial support to economic activity while also significantly boosting the budget deficit and debt

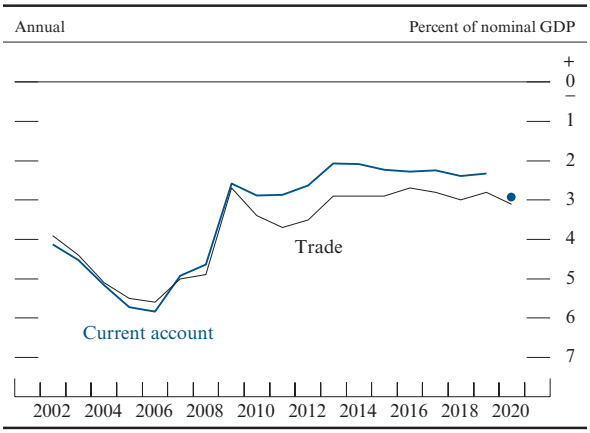
Federal fiscal policy measures enacted in response to the pandemic continue to provide crucial income support to households and businesses, as well as grants-in-aid to state and local governments. These measures have also facilitated loans to businesses, households, states, and localities.[10] In total, the Congressional Budget Office projects that in fiscal years 2020 and 2021, the additional federal government expenditures and foregone revenues from these policies will total roughly $3 trillion—around 15 percent of nominal GDP.[11] In addition, the decline in economic

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



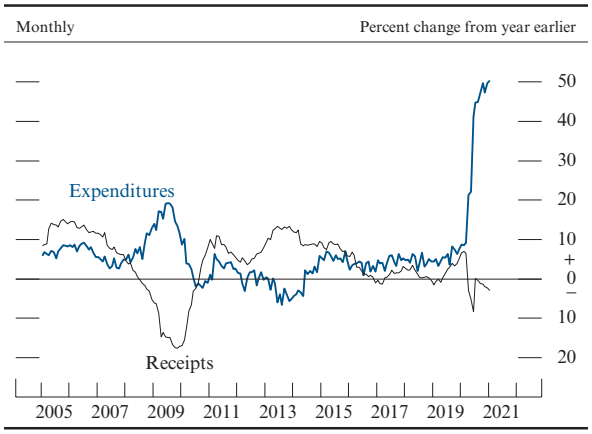
NOTE: GDP is gross domestic product. The data for the trade balance extend through 2020. The data for the current account balance extend through 2019. The blue dot refers to the average current account balance for 2020:Q1–2020:Q3.

SOURCE: Bureau of Economic Analysis via Haver Analytics.

10. These policy measures include the CARES Act from last spring and the Consolidated Appropriations Act, 2021, enacted in December. Passage of additional fiscal support remains under discussion.

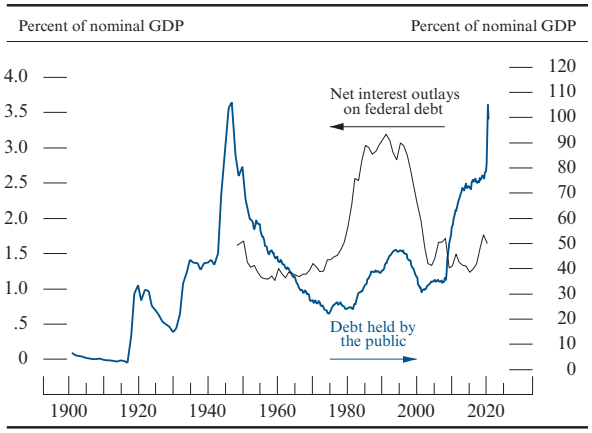
11. The CBO's projection and estimate can be found at Congressional Budget Office (2020), *An Update to the Budget Outlook: 2020 to 2030* (Washington: CBO, September 2), https://www.cbo.gov/publication/56517; and Congressional Budget Office and Joint Committee

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 2020. 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 begin in 1900 and are annual from 1900 to 1951 and quarterly thereafter. The data for gross domestic product (GDP) and federal debt extend through 2020:Q3.
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."

activity has pushed down tax receipts while pushing up outlays for certain transfer programs—most notably for unemployment insurance and Medicaid (figure 25). These tax decreases and transfer increases (referred to as automatic stabilizers) worked in tandem with the discretionary stimulus to support aggregate demand and blunt the extent of the economic downturn.

The combination of the discretionary stimulus measures and the automatic stabilizers caused the budget deficit in fiscal 2020 to rise to 15 percent of nominal GDP—the largest deficit as a share of GDP in the post–World War II era—up from its already elevated level of 4½ percent in fiscal 2019. Consequently, the ratio of federal debt held by the public to nominal GDP rose from 79 percent in fiscal 2019 to 100 percent by the end of fiscal 2020, the highest debt-to-GDP ratio since 1947 (figure 26). Even so, the cost of servicing the federal debt is not particularly elevated by historical standards, because Treasury rates are extremely low.

State and local governments are facing challenging fiscal conditions

State and local governments are confronting challenging budget conditions because of weak tax collections and extraordinary expenses related to the pandemic. Nominal state government tax collections in 2020 were about 1 percent below their 2019 level and well below levels generally expected before the pandemic (figure 27).[12] The magnitude of

on Taxation (2021), "H.R. 133, Summary Estimate for Divisions M Through FF Consolidated Appropriations Act, 2021 Public Law 116–260," cost estimate, January 14, https://www.cbo.gov/publication/56963.

12. State tax collection data are available through November 2020. For additional details, see Urban Institute (2020), "State Tax and Economic Review," State and Local Finance Initiative, November, https://www.urban.org/policy-centers/cross-center-initiatives/state-and-local-finance-initiative/projects/state-tax-and-economic-review (accessed January 2021).

Although depressed, tax receipts have not fallen as significantly as economic activity, for several reasons. First, some of the federal fiscal aid to households (for

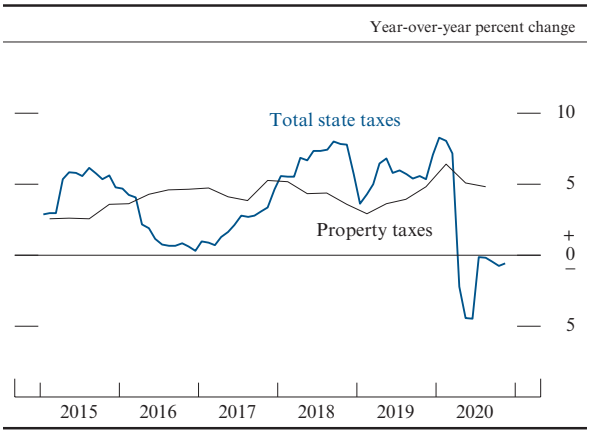
these revenue shortfalls varied considerably across states, with the largest shortfalls in states that rely heavily on sales taxes, tourism, and energy production. In contrast, property taxes—the principal local government tax—have continued to rise apace, and state and local governments have received federal aid that has assisted with COVID-related expenses and helped ease budget strains. Meanwhile, bond market conditions for state and local governments have been generally accommodative in the second half of the year, as robust municipal bond issuance has been supported by historically low yields and tax-exempt municipal bond funds have seen solid inflows. Even so, in response to social-distancing restrictions (including virtual learning), current budget pressures, and concerns over future budgetary challenges, state and local governments have cut payrolls—particularly in the education sector—an unprecedented 6½ percent over the past year (figure 28). Notably, public-sector employment is down significantly in nearly all states, including those that have experienced relatively smaller revenue shocks.

Vaccines offer hope of an end to the pandemic, but risks to the outlook are still substantial

The economic outlook presented in Part 3 depends crucially on the course of the COVID-19 pandemic. The vaccination campaign now under way offers the prospect of a return to more normal conditions by the end of this year. But the pace of vaccinations, the rate of decline in the spread of the virus, and the speed with which people return to normal activities all remain highly uncertain, particularly given the emergence of new, apparently more contagious strains. The longer-run economic effects of the pandemic are also difficult to predict. Many

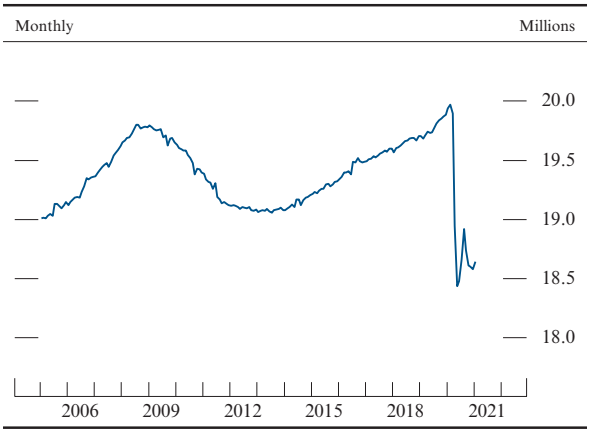
example, unemployment benefits) is taxable. Second, goods consumption, which is likelier to be subject to sales taxes than services, has largely held up. Finally, unemployment has been concentrated among low-income individuals, who pay less in income taxes.

27. State and local tax receipts



NOTE: State tax data are 12-month percent changes of 4-quarter moving averages, extend through November 2020, and are aggregated over all states except Wyoming, for which data are not available. Revenues from Washington, DC, are also excluded. Data for October and November are missing for New Mexico, as this state has longer reporting lags than others. Property tax data are 4-quarter percent changes of 4-quarter moving averages, extend through 2020:Q3, and are primarily collected by local governments.
SOURCE: State Tax and Economic Review Project; State and Local Finance Initiative at Urban Institute; Census Bureau.

28. State and local government payroll employment



NOTE: The data are seasonally adjusted.
SOURCE: Bureau of Labor Statistics, National Compensation Survey.

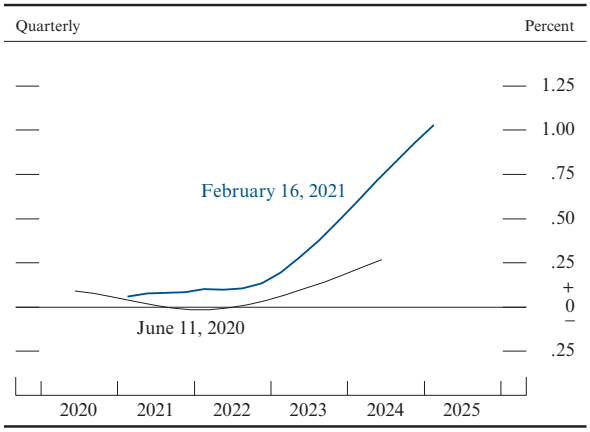
small businesses have shut down and may not reopen. Some pandemic-driven shifts in economic activity, such as from in-person to online shopping and from office-based to remote work, may prove to be permanent. These shifts could increase productivity by substituting remote interactions for costly travel and commuting, but they could also put persistent upward pressure on unemployment, as affected workers may need to seek new jobs and perhaps new occupations. The pandemic has also disrupted schooling at all levels, which could have persistent negative effects on educational attainment and economic outcomes for affected students.

Financial Developments

The expected level of the federal funds rate over the next few years has remained near zero

Economic forecasters and financial market participants expect the federal funds rate over the next several years to remain at the effective lower bound. Market-based measures of federal funds rate expectations over the next few years have increased moderately since June and remain below 0.25 percent until the second quarter of 2023 (figure 29).[13] According to the results of the Survey of Primary Dealers and the Survey of Market Participants, both conducted by the Federal Reserve Bank of New York in January, the median respondent views the most likely path of the federal funds rate as remaining in its current range of 0 to ¼ percent until the first half of 2024.[14]

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 June 11, 2020, is compared with that as of February 16, 2021. The path is estimated with a spline approach, assuming a term premium of 0 basis points. The June 11, 2020, path extends through June 2024 and the February 16, 2021, path through January 2025.

SOURCE: Bloomberg; Federal Reserve Board staff estimates.

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

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

Yields on longer-term U.S. nominal Treasury securities increased markedly . . .

Yields on nominal Treasury securities at longer maturities increased markedly since mid-2020 after falling sharply in late February and early March as investors' concerns regarding the implications of the COVID-19 outbreak for the economic outlook led to both falling policy rate expectations and flight-to-safety flows (figure 30). The increase in yields on longer-term Treasury securities followed news of the imminent arrival of multiple highly effective COVID-19 vaccines in the fall of 2020 and expectations of further fiscal support, as well as an increase in the issuance of longer-term Treasury securities. Near-term uncertainty about longer-dated nominal Treasury yields—as measured by volatility of near-term swaptions of 10-year interest rates—has remained low.

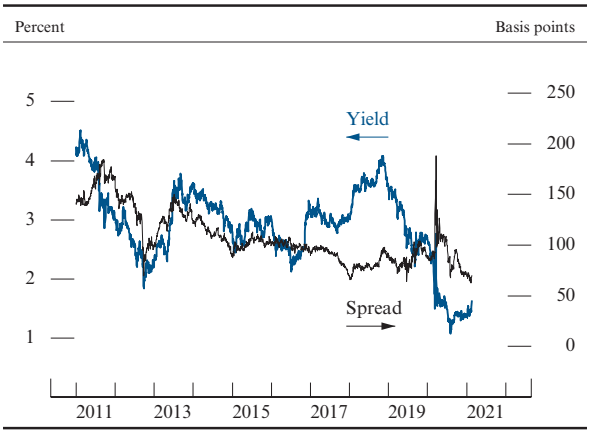
30. Yields on nominal Treasury securities

SOURCE: Department of the Treasury via Haver Analytics.

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

Despite the rise in Treasury yields, yields on 30-year agency mortgage-backed securities (MBS)—an important determinant of mortgage interest rates—decreased somewhat, on balance, amid the Federal Reserve's ongoing purchases of MBS and have remained near their historical lows (figure 31). Thus, the spread between yields on 30-year agency MBS and comparable-maturity Treasury yields has narrowed.

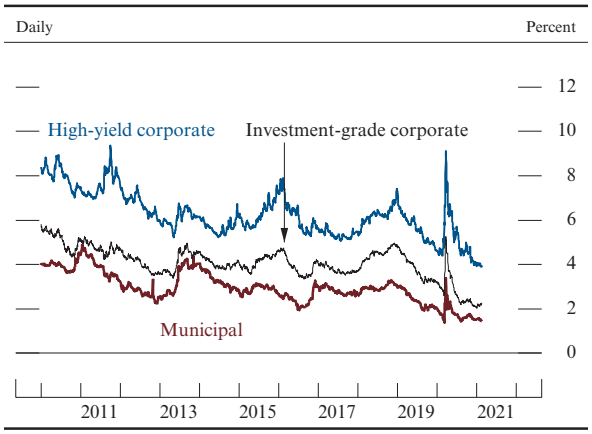
31. Yield and spread on agency mortgage-backed securities



NOTE: The yield is on mortgage-backed securities from Fannie Mae through May 31, 2019, and from uniform mortgage-backed securities thereafter. Data are daily.
SOURCE: Department of the Treasury; J.P. Morgan. Courtesy of J.P. Morgan Chase & Co., Copyright 2021.

Approval of the effective vaccines late last year, optimism about further fiscal support, and notable improvement in the outlook for corporate earnings boosted investors' optimism, and improvement in the credit quality of firms drove declines in yields on investment- and speculative-grade corporate bonds (figure 32). As with mortgage securities, spreads on corporate bond yields over comparable-maturity nominal Treasury yields have narrowed considerably since the end of June—as corporate bond yields declined and yields on nominal Treasury

32. Corporate bond yields, by securities rating, and municipal bond yield



NOTE: Investment-grade corporate is the 10-year triple-B, which reflects the effective yield of the ICE BofAML 7-to-10-year triple-B U.S. Corporate Index (C4A4). High-yield corporate is the 10-year high yield and reflects the effective yield of the ICE BofAML 7-to-10-year U.S. Cash Pay High Yield Index (J4A0). Municipal is the Municipal Market Advisors 20-year yield.

SOURCE: ICE Data Indices, LLC, used with permission; Municipal Market Advisors.

securities increased—and have returned to levels observed before the pandemic. Yields on municipal debt continued to decline in the second half of 2020, and spreads on municipal bonds over comparable-maturity nominal Treasury yields have narrowed substantially since the end of June, as nominal Treasury yields increased and investors grew more optimistic about further fiscal stimulus and aid to state and local governments. The year-end expiration of lending facilities that were authorized under section 13(3) of the Federal Reserve Act and that use CARES Act funding did not lead to upward pressure on corporate or municipal bond spreads.

. . . and market functioning for Treasury securities, corporate bonds, mortgage-backed securities, and municipal bonds continued to improve . . .

After having improved substantially in the spring of last year, measures of market liquidity for Treasury securities—such as measures of market depth and trade sizes—continued to improve somewhat in the second half of 2020 and moved closer to pre-pandemic levels, especially for shorter-dated Treasury securities. However, measures of liquidity for longer-dated Treasury securities and in some portions of the MBS market—notably for those securities excluded from Federal Reserve open market purchases—remained somewhat below pre-pandemic levels. Measures of market functioning of the corporate bond market continued to improve as bid-ask spreads narrowed considerably and returned to their pre-pandemic levels and issuance of corporate bonds in primary markets was robust. Measures of market functioning of the municipal bond market—such as robust issuance of municipal bonds in primary markets and round-trip transaction costs—indicate that market conditions remained stable in the second half of 2020.

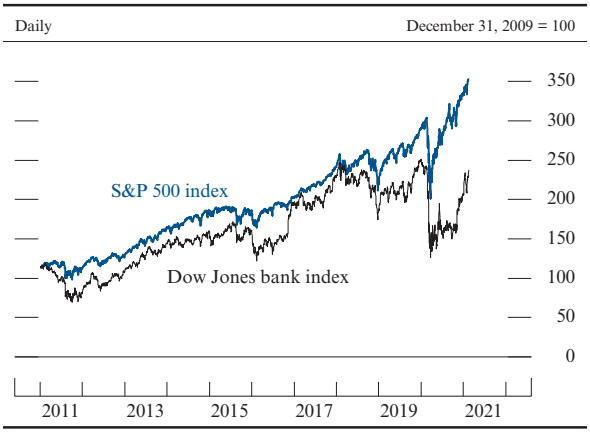
. . . while conditions in short-term funding markets remained stable

The effective federal funds rate and other secured and unsecured short-term rates continued to trade within the target range of the federal funds rate, as ample liquidity, primarily due to substantial increases in reserves, has kept markets functioning smoothly. Since June, measures of stress in short-term funding markets—including trading volumes, issuance, and spreads to overnight index swaps—have remained stable at or near pre-pandemic levels, and year-end funding pressures were minimal.

Broad stock prices have risen notably

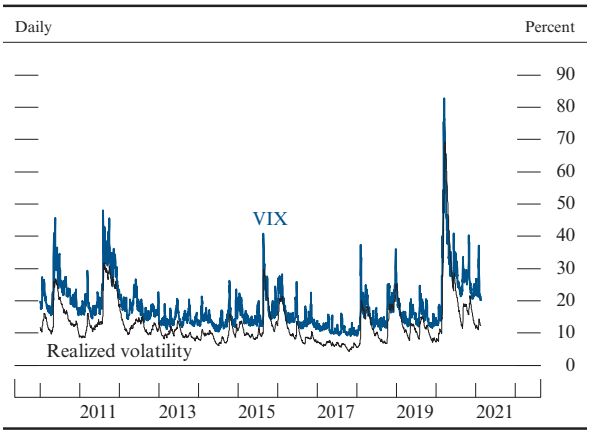
After starting to rebound last spring from their COVID-related declines, broad stock prices have risen notably further since mid-2020, as the arrival of effective vaccines, optimism about further fiscal support, and notable improvement in the outlook for corporate earnings outweighed investor concerns regarding the rise in COVID-19 cases (figure 33). The prospect of an economic recovery aided by effective vaccines and fiscal support led to outsized price gains in some cyclical sectors, such as the consumer discretionary, materials, and information technology sectors. Similarly, stock prices of smaller corporations considerably outperformed large-cap stock price indexes. After experiencing depressed levels through early fall, bank stock price indexes increased considerably in late 2020, boosted by positive vaccine news, a generally improved investor outlook for loan losses and bank profitability, and the release of favorable stress-test results in late 2020. Measures of realized and implied stock price volatility for the S&P 500 index—the 20-day realized volatility and the VIX—decreased sharply from their very high levels at the end of the second quarter but remained moderately above their historical medians, respectively (figure 34). (For a discussion of financial stability issues, see the box "Developments Related to Financial Stability.")

33. Equity prices



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

34. 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

This discussion reviews vulnerabilities in the U.S. financial system since the COVID-19 outbreak and summarizes recent actions and developments at facilities established by the Federal Reserve to support the flow of credit throughout the economy.[1] 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.

Overall, asset valuation pressures, which were elevated before the COVID-19 outbreak in the United States, briefly subsided at the onset of the outbreak as asset prices plummeted but have since retraced in most markets. In particular, prices in equity, corporate bond, and residential real estate (RRE) markets have returned to or exceeded pre-pandemic levels, buoyed in part by recent developments related to vaccines. Equity prices have more than recovered from the steep declines at the onset of the pandemic, with investor appetite broadly rebounding across most sectors. Equity market volatility remains high, indicating persistent uncertainty regarding the pandemic and the related course of economic activity. Yields on corporate bonds over comparable-maturity Treasury securities have narrowed considerably. Treasury yields across the maturity spectrum declined at the onset of the pandemic and remain near historical lows. The credit quality of outstanding leveraged loans deteriorated early this year, but investor appetite remains strong and new issuance has increased in the second half of 2020. RRE prices also rose rapidly in the second half of 2020, outpacing rent increases. Commercial real estate prices remain at historically high levels despite high vacancy rates and appear susceptible to sharp declines, particularly if the pace of distressed transactions picks up or, in the longer term, the pandemic leads to permanent changes in demand.

Vulnerabilities associated with business and household debt increased over the course of 2020. Business debt has risen from levels that were already elevated before the outbreak of the pandemic. Business leverage now stands near historical highs. While near-term risks associated with debt service may be limited by large cash balances at large firms, low interest rates, and recently improved earnings prospects, insolvency risks at small and medium-sized firms, as well as at some large firms, remain considerable. The household sector entered the downturn with relatively low debt but experienced significant financial strains because of the unprecedented spike in unemployment and business closures. Government programs—including expanded unemployment insurance and direct stimulus payments in the Coronavirus Aid, Relief, and Economic Security Act, or CARES Act—and a rebound in economic activity in the second half of 2020 reduced economic hardship for households and mitigated the deterioration in household credit quality.

In the financial sector, bank profitability and capital positions, which were strained by the outbreak of the pandemic, improved in the second half of 2020 because of a combination of lower-than-expected losses, a better economic outlook, and restrictions imposed by the Federal Reserve on capital distributions by the largest banks. In particular, the capitalization of U.S. global systemically important banks, or G-SIBs, exceeds pre-pandemic levels. In addition, the results of stress tests released in June and December 2020 indicated that banks would generally remain well capitalized under extremely severe recession scenarios. Leverage at broker-dealers changed little over 2020 and remains at historically low levels. While the liquidity deterioration across dealer-intermediated markets in March 2020 demonstrated potential fragility despite dealers' low leverage, this fragility has been likely mitigated by emergency lending facilities and the supervisory action of the Federal Reserve. By contrast, leverage at life insurance companies has risen to post-2008 highs. Vulnerabilities from leverage at hedge funds remain elevated. Finally, securitization volumes increased after coming to a halt in March 2020 but remain significantly below pre-pandemic levels.

Over the course of 2020, banks relied only modestly on short-term wholesale funding and maintained significant levels of high-quality liquid assets. By contrast, developments at the onset of the pandemic demonstrated significant structural vulnerabilities at money market mutual funds and open-end investment funds, particularly those that invest substantially in

(continued)

1. The *Financial Stability Report* published in November 2020 presents the most recent, detailed assessment of U.S. financial system vulnerabilities and a summary of Federal Reserve actions and developments at facilities during the COVID-19 crisis. See Board of Governors of the Federal Reserve System (2020), *Financial Stability Report* (Washington: Board of Governors, November), https://www.federalreserve.gov/publications/files/financial-stability-report-20201109.pdf.

corporate and municipal debt. These funds experienced large, sudden redemptions in March 2020, which contributed to strains in broader short-term funding markets and fixed-income debt markets. Federal Reserve actions, including emergency lending facilities, have mitigated these vulnerabilities for now, but without structural reforms, the vulnerabilities demonstrated in March 2020 will persist and could significantly amplify future shocks.

The outlook for the pandemic and economic activity remains uncertain globally. In response to the economic disruptions caused by the pandemic, many foreign governments have ramped up spending to support households and businesses. Nevertheless, financial systems in some foreign economies are more vulnerable than before the pandemic, and these vulnerabilities may grow in the near term. Risks from widespread and persistent stresses in emerging markets and dollar funding markets could interact with risks associated with the course of COVID-19 for the U.S. financial system. In turn, these risks could be amplified by the vulnerabilities identified in this discussion and produce additional strains for the U.S. financial system and economic activity.

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

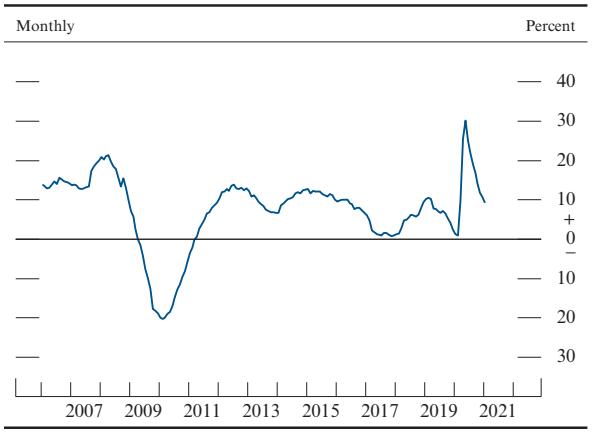
In the immediate wake of the pandemic, the Federal Reserve took forceful actions and established emergency lending facilities, with the approval of the Secretary of the Treasury as needed. These actions and facilities have supported the flow of credit to households and businesses and have served as backstop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

Some of the facilities established at the onset of the pandemic are still operational. The Commercial Paper Funding Facility (CPFF), the Money Market Mutual Fund Liquidity Facility (MMLF), and the Primary Dealer Credit Facility (PDCF) stabilized short-term funding markets and improved the flow of credit to households and businesses. Although balances in the PDCF, CPFF, and MMLF have fallen from their initial highs to low levels, the facilities will continue to serve as important backstops against further market stress until their scheduled expiration at the end of March 2021. The Paycheck Protection Program Liquidity Facility (PPPLF) was established to extend credit to lenders that participate in the Paycheck Protection Program of the Small Business Administration (SBA), which has provided payroll support for small businesses. Through mid-January 2021, the Federal Reserve has made nearly 15,000 PPPLF advances to more than 850 banking institutions, totaling more than $110 billion in liquidity.

The Federal Reserve has taken actions that 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 temporary swap lines and the FIMA Repo Facility will continue to serve as liquidity backstops until their scheduled expiration at the end of September 2021.

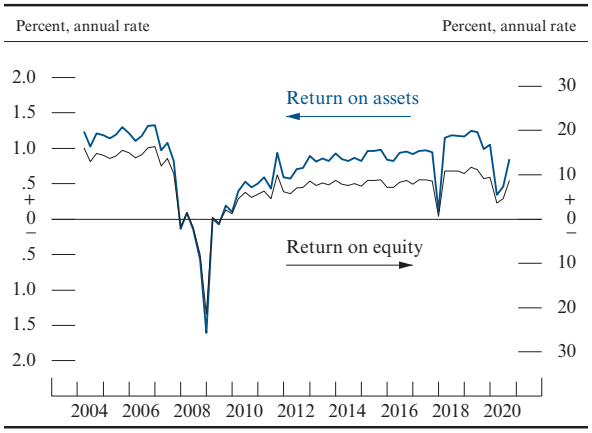
Other facilities established at the onset of the pandemic expired either at the end of December 2020 or at the beginning of January 2021. The Primary Market Corporate Credit Facility, the Secondary Market Corporate Credit Facility, and the Municipal Liquidity Facility were established to improve the flow of credit through bond markets, where large firms and municipalities obtain most of their long-term funding. The Term Asset-Backed Securities Loan Facility was also set up to support the issuance of securities backed by student loans, auto loans, credit card loans, loans backed by the SBA, and certain other assets. Altogether, before expiring at the end of 2020, these facilities brought rapid improvements to credit markets, with only modest direct interventions. The Main Street Lending Program (Main Street) expired at the beginning of January 2021. In its period of operation, Main Street purchased about 1,800 loan participations, totaling more than $16 billion, which helped small and medium-sized businesses from some of the hardest-hit areas of the country and covered a wide range of industries.

35. Commercial and industrial loan growth



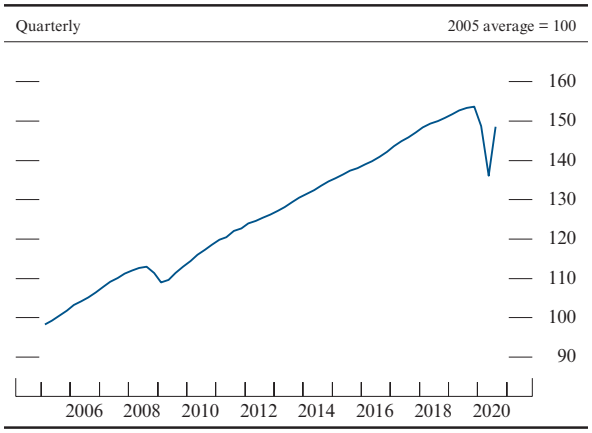
NOTE: Data are calculated as monthly year-over-year growth rates.
SOURCE: Federal Reserve Board, Statistical Release H.8, "Assets and Liabilities of Commercial Banks in the United States."

36. Profitability of bank holding companies



NOTE: The data are quarterly, extend through 2020:Q3, and are seasonally adjusted.
SOURCE: Federal Reserve Board, Form FR Y-9C, Consolidated Financial Statements for Bank Holding Companies.

37. Foreign real gross domestic product



NOTE: The data extend through 2020:Q3. Foreign GDP 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, https://www.dallasfed.org/institute/dgei/gdp.aspx.

Bank credit contracted, while bank profitability improved

In contrast with strong debt issuance through securities markets, outstanding bank loan balances across most major loan categories have contracted since mid-June amid generally weak borrower demand and tight lending standards. Commercial and industrial (C&I) loans at banks declined sharply in the second half of 2020, reflecting the repayment of large credit-line draws made earlier in the year and the forgiveness of some loans under the Paycheck Protection Program, as well as generally weak borrower demand for such loans and tighter bank lending standards. However, overall C&I loan balances at banks remained higher compared with a year earlier (figure 35). Measures of bank profitability, such as return on assets and return on equity, rebounded in the second half of 2020 following very low readings in the second quarter, when banks significantly increased their loan loss provisions, but have remained below pre-pandemic levels (figure 36). Delinquency rates on bank loans remained low, as banks' loss-mitigation and forbearance programs allowed many borrowers to stay current on their loans. Large banks posted higher-than-expected earnings in the fourth quarter, bolstered by capital market activity and loan loss reserve releases, while low rates continued to weigh on profit margins.

International Developments

Economic activity abroad snapped back in the third quarter . . .

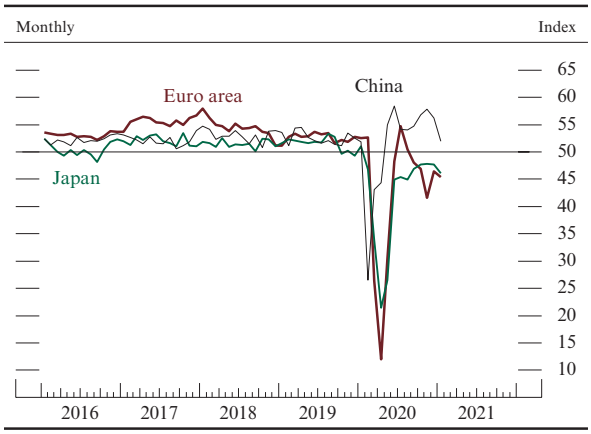
As in the United States, foreign GDP partially rebounded in the third quarter of 2020 (figure 37). Nonetheless, foreign economic

activity remains well below its pre-pandemic level, as a resurgence of infections in many economies has recently led to renewed social-distancing restrictions. The accompanying slowdown in economic activity appears to have been less dramatic than that in the spring, as economies have adjusted to function better under social-distancing restrictions. In addition, many current containment measures have been less stringent relative to those in the spring, and fiscal and monetary policies continue to support the path to recovery.

Since last spring, manufacturing has generally recovered more than services, which remain depressed because consumers have avoided socially intensive activities, especially in the hospitality and leisure sectors (figure 38). Some higher-income Asian economies, where infections are more under control, experienced relatively better GDP growth than many advanced economies and benefited from increased export demand in the second half of 2020. Most notably, China's GDP was 6.5 percent higher in the fourth quarter of 2020 compared with a year ago. In many Latin American countries and advanced foreign economies (AFEs), fourth-quarter GDP contracted relative to a year earlier (figure 39).

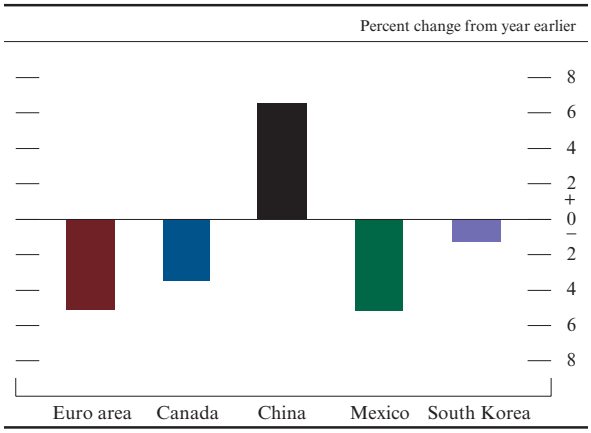
Although the ongoing spread of the virus—including new variants—is concerning, many AFEs have already started immunizing their populations and have commitments to purchase substantial stocks of vaccines. Controlling the virus globally, however, will be challenging, in part because many emerging market economies (EMEs) have more limited access to vaccines and face greater distribution challenges.

38. Services purchasing managers index in selected foreign economies



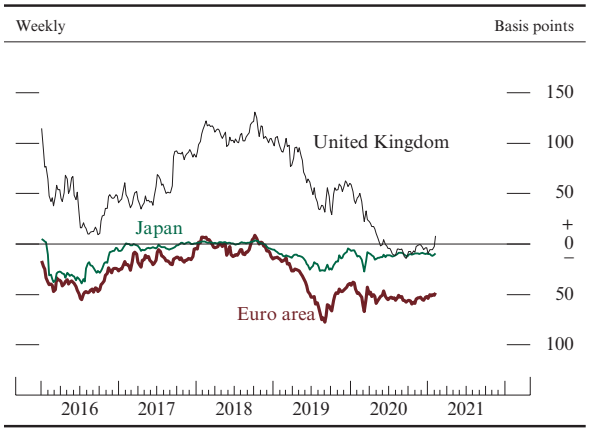
NOTE: For the foreign services output purchasing managers index (PMI), values greater than (less than) 50 indicate better (worse) business conditions, on average, for the participants surveyed relative to conditions at the time of the previous survey.
SOURCE: IHS Markit, Global Sector PMI.

39. Real gross domestic product in selected foreign economies



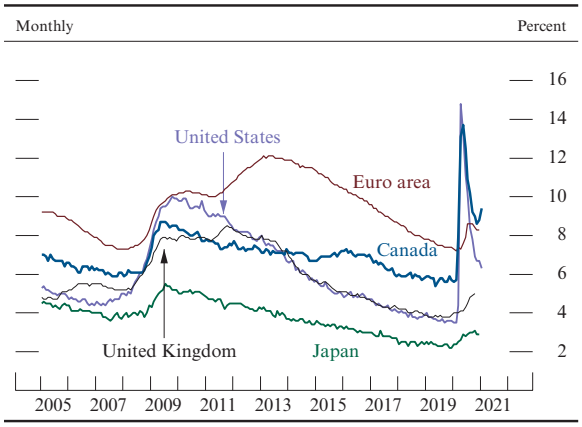
NOTE: The data are for 2020:Q4. For Canada, the euro area, and Mexico, the values correspond to flash estimates of GDP. For South Korea, the value is the advance GDP estimate. For China, the value corresponds to preliminary GDP.
SOURCE: For the euro area, Eurostat; for Canada, Statistics Canada; for China, National Bureau of Statistics of China; for Mexico, Instituto Nacional de Estadística y Geografía; for South Korea, Bank of Korea; all via Haver Analytics.

40. 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 begin on Thursdays and extend through February 10, 2021.
SOURCE: Bloomberg; Federal Reserve Board staff estimations.

41. Unemployment rate in selected advanced economies



NOTE: The data for the United Kingdom extend through October 2020 and are centered 3-month averages of monthly data. The data for the euro area and Japan extend through December 2020.
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.

. . . with considerable policy support and subdued inflation

Efforts to contain the virus's resurgence in the fourth quarter prompted some foreign central banks and fiscal authorities to provide additional support to households and businesses, particularly in the AFEs. High debt levels limited the fiscal space in some EMEs, and emergency aid to sustain employment and household spending expired in some EMEs with elevated fiscal concerns. Monetary policy across foreign economies was highly accommodative, and financing conditions remained supportive of growth, with a few major AFE central banks introducing new stimulus measures late last year. Indeed, market-implied policy paths for the Japanese, U.K., and European central banks signal a prolonged period of monetary accommodation (figure 40).

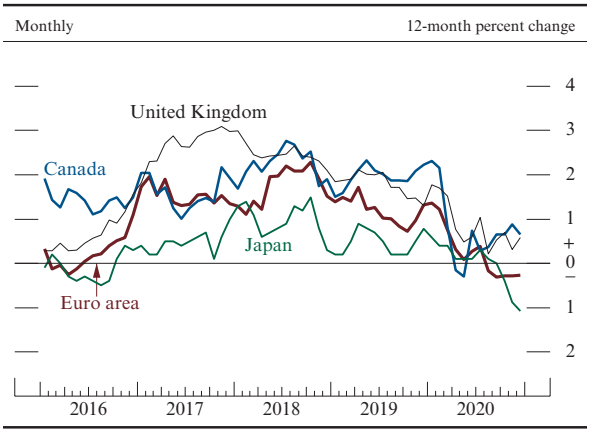
Even with substantial policy support, AFE unemployment rates at the end of 2020 are higher than they were before the pandemic. Unemployment rates in Europe and Japan rose moderately during the spring and have remained relatively unchanged (figure 41). Canada, however, endured a large and rapid increase in unemployment during the spring and a commensurate decline by year-end, similar to the U.S. experience. The country-specific dynamics of unemployment partly reflect differences in labor market structures, employment protection regulations, and the expansion of wage subsidy programs. In general, unemployment rates in the EMEs increased since the start of the pandemic, and some Asian economies adopted direct wage subsidies to avert large dislocations in their labor markets.

Despite the recovery in activity and employment in some sectors of the economy, lower overall demand and continued uncertainty about the path of the virus helped keep inflation subdued abroad. In many foreign economies, inflation remains below central banks' targets. In the euro area and Japan, the consumer price index fell in 2020, reflecting subdued inflation expectations and persistent economic slack (figure 42).

Longer-term sovereign yields remained low, while risk sentiment improved . . .

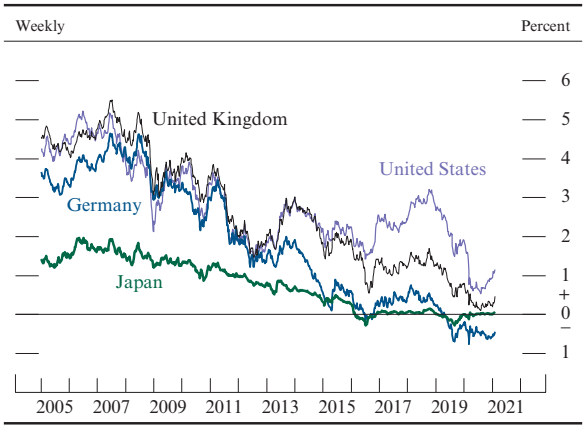
Longer-term sovereign yields in major AFEs have moved up, on net, but remained near historically low levels amid continued monetary policy accommodation (figure 43). Foreign equity markets rebounded in the second half of 2020, reflecting not only supportive monetary and fiscal policies, but also the development of effective vaccines. Although AFE stock markets largely recovered, they still underperformed U.S. equities, with greater restrictions on activity abroad and a lower share of companies that benefited from the digital economy (figure 44).

42. Consumer price inflation in selected advanced foreign economies



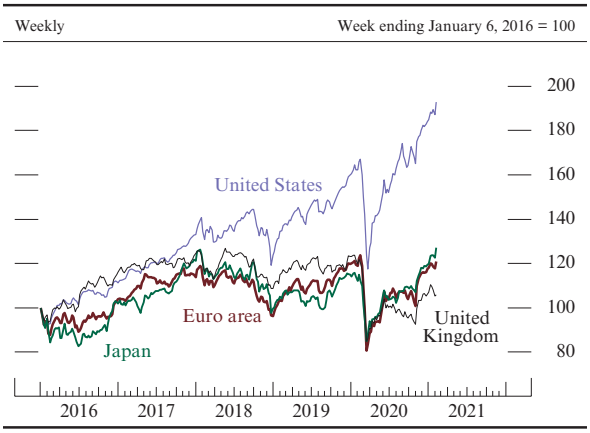
NOTE: The data extend through December 2020.
SOURCE: For the United Kingdom, Office for National Statistics; for Japan, Ministry of Internal Affairs and Communications; for the euro area, Statistical Office of the European Communities; for Canada, Statistics Canada; all via Haver Analytics.

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



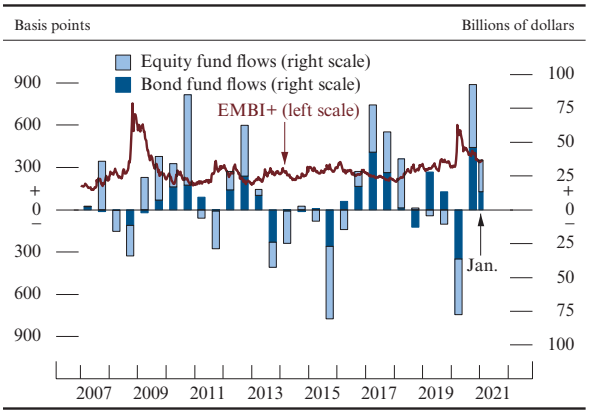
NOTE: The data are weekly averages of daily benchmark yields. The data begin on Thursdays and extend through February 10, 2021.
SOURCE: Bloomberg.

44. Equity indexes for selected advanced economies



NOTE: The data are weekly averages of daily data. The data begin on Thursdays and extend through February 10, 2021.
SOURCE: For euro area, DJ Euro Stoxx Index; for Japan, TOPIX Stock Index; for United Kingdom, FTSE 100 Stock Index; for United States, S&P 500 Index; all via Bloomberg. (For Dow Jones Indices licensing information, see the note on the Contents page.)

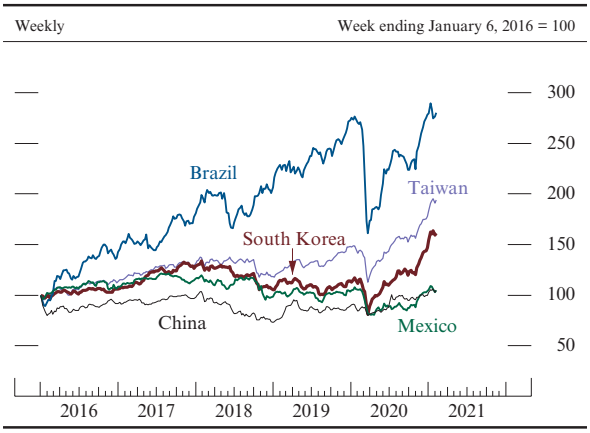
45. Emerging market mutual fund flows and spreads



NOTE: The bond and equity fund flows data are semiannual sums of weekly data from December 28, 2006, to December 30, 2020, and a monthly sum of weekly data from December 31, 2020, to January 26, 2021. Weekly data span Thursday through Wednesday, and the semiannual and monthly values are sums over weekly data for weeks ending in that half year 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. The weekly data begin on Thursdays and extend through February 10, 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.

46. Equity indexes for selected emerging market economies



NOTE: The data are weekly averages of daily data. The data begin on Thursdays and extend through February 10, 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.

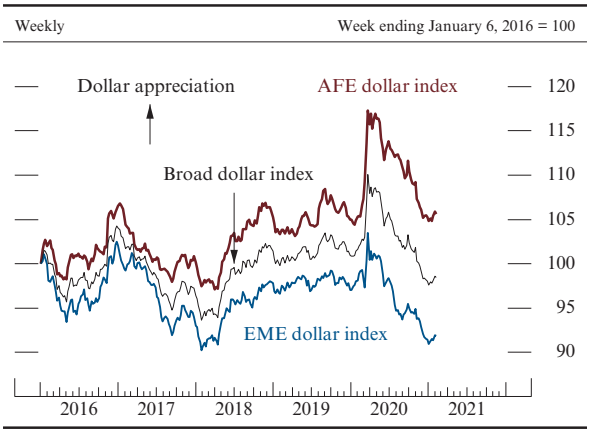
EME equity markets have recovered since the spring, with recent strong capital inflows (figure 45). Asian equity indexes rose well above pre-pandemic levels, while those in Latin America posted modest gains relative to a year ago, largely reflecting Asian economies' lower infection rates, better fundamentals, and larger fiscal space to provide additional stimulus (figure 46). Along with the improvement in equity markets, sovereign borrowing spreads generally narrowed, although they are still above pre-pandemic levels.

. . . and the broad dollar depreciated

The broad dollar index—a measure of the trade-weighted value of the dollar against

foreign currencies—fell in the second half of last year. Both the continued improvement in market conditions following the stresses of last March and highly accommodative U.S. monetary policy contributed to dollar depreciation. On balance, the dollar has depreciated about 3.5 percent relative to a year ago (figure 47). The dollar broadly weakened against AFE currencies, notably the euro. The dollar also fell against some Asian emerging market currencies, particularly the Chinese renminbi and Korean won (figure 48).

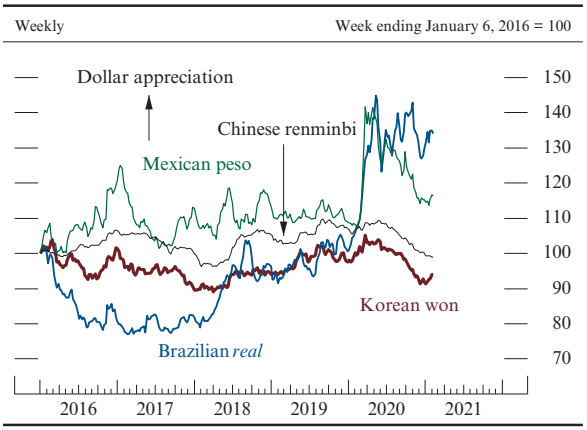
47. U.S. dollar exchange rate indexes



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 dat begin on Thursdays and extend through February 10, 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 emerging market economies



NOTE: The data, which are in foreign currency units per dollar, are weekly averages of daily data. The weekly data begin on Thursdays and extend through February 10, 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 . . .

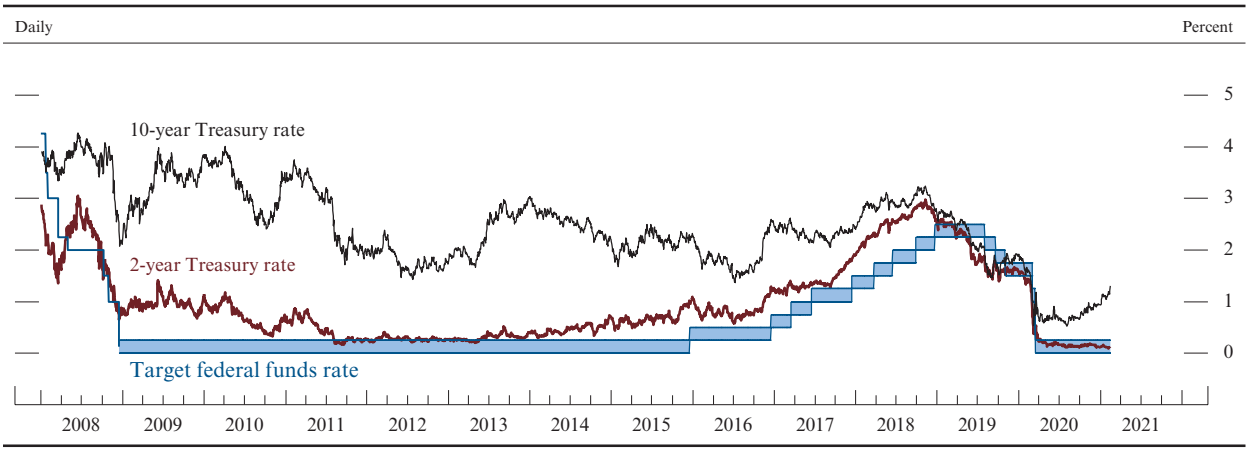
In light of the effects of the continuing public health crisis on the economy and the associated risks to the outlook, the Federal Open Market Committee (FOMC) has maintained the target range for the federal funds rate at 0 to ¼ percent since March 2020, when the global pandemic led the Committee to quickly lower the target range to the effective lower bound (figure 49).[15] In its revised Statement on Longer-Run Goals and Monetary Policy Strategy, issued in August, the Committee reaffirmed its commitment to achieving maximum employment and inflation at the rate of 2 percent over the longer run and noted 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" so that inflation averages 2 percent over time and longer-term inflation expectations remain well anchored at 2 percent. (See the box "The FOMC's Revised Statement on Longer-Run Goals and Monetary Policy Strategy.") The Committee expects to maintain an accommodative stance of monetary policy until these outcomes are achieved and 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.

. . . 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

15. See the FOMC statements issued since the March meetings, which are available (along with other postmeeting statements) on the Monetary Policy portion of the Board's website at https://www.federalreserve.gov/monetarypolicy.htm.

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.

The FOMC's Revised Statement on Longer-Run Goals and Monetary Policy Strategy

On August 27, 2020, the Federal Open Market Committee (FOMC) issued a revised Statement on Longer-Run Goals and Monetary Policy Strategy.[1] This document, first released in January 2012, lays out the Committee's goals, articulates its framework for monetary policy, and serves as the foundation for its policy actions. The revised statement encapsulates the key conclusions from the Federal Reserve's review of the monetary policy strategy, tools, and communication practices it uses to pursue its statutory dual-mandate goals of maximum employment and price stability.

The review, which commenced in early 2019, was undertaken because the U.S. economy has changed in ways that matter for monetary policy. In particular, the neutral level of the policy interest rate—the policy rate consistent with the economy operating at full strength and with stable inflation—has fallen over recent decades in the United States and abroad. This decline in the neutral policy rate increases the risk that the effective lower bound (ELB) on interest rates will constrain central banks from reducing their policy interest rates enough to effectively support economic activity during downturns. In addition, during the economic expansion that followed the Global Financial Crisis—the longest U.S. expansion on record—the unemployment rate hovered near 50-year lows for roughly 2 years, resulting in new jobs and opportunities for many who have typically been left behind. At the same time, with brief exceptions, inflation ran below the Committee's 2 percent objective.

The revised statement begins by reaffirming the Committee's commitment to its statutory mandate from the Congress to promote maximum employment, price stability, and moderate long-term interest rates. It also describes the benefits of explaining policy actions to the public as clearly as possible. The statement then outlines important changes to the characterization of the Committee's policy framework for achieving its dual-mandate goals of maximum employment and price stability. After stating that economic variables fluctuate in response to disturbances and that monetary policy plays an important role in stabilizing the economy, the statement notes that the Committee's primary means of adjusting policy is through changes in the policy interest rate (the target range for the federal funds rate). Furthermore, because the neutral level of the policy rate is now lower than its historical average, "the federal funds rate is likely to be constrained by its effective lower bound more frequently than in the past." Therefore, "the Committee judges that downward risks to employment and inflation have increased." The statement then notes that the "Committee is prepared to use its full range of tools to achieve its maximum employment and price stability goals," indicating that it could deploy other policy tools, such as forward guidance and asset purchases, when the policy rate is at its ELB.

In its revised statement, the Committee characterizes maximum employment as a "broad-based and inclusive goal" in addition to saying—as it did in the 2012 statement—that maximum employment is not directly measurable and that it changes over time and depends largely on nonmonetary factors. During the *Fed Listens* events that were a pillar of the review of monetary policy strategy, tools, and communication practices, policymakers heard from a broad range of stakeholders in the U.S. economy about how monetary policy affects peoples' daily lives and livelihoods.[2]

(continued)

1. The FOMC's revised Statement on Longer-Run Goals and Monetary Policy Strategy, which was unanimously reaffirmed at the FOMC's January 2021 meeting, appears in the front matter of this report. Additional information about the Federal Reserve's review of monetary policy strategy, tools, and communication practices and the revised statement is available on the Board's website at https://www.federalreserve.gov/monetarypolicy/review-of-monetary-policy-strategy-tools-and-communications.htm.

2. Between February 2019 and May 2020, the Federal Reserve System hosted 15 *Fed Listens* events with representatives of the public. See Board of Governors of the Federal Reserve System (2020), *Fed Listens: Perspectives*

A key takeaway from these events was that a strong labor market during the late stages of an economic expansion—conditions that were in effect in 2019 and early 2020—offers significant benefits to residents of low- and moderate-income communities, primarily by providing employment opportunities for people who have had difficulty finding jobs in the past.

The revised statement says that "the Committee's policy decisions must be informed by assessments of the *shortfalls* [emphasis added] of employment from its maximum level" rather than by "deviations"—the word used in the earlier statement.[3] In previous decades, inflation tended to rise noticeably in response to a strengthening labor market. It was sometimes appropriate for the Fed to tighten monetary policy as employment rose toward its estimated maximum level in order to stave off an unwelcome rise in inflation. The change to "shortfalls" clarifies that, in the future, the Committee will not have concerns when employment runs at or above real-time estimates of its maximum level unless accompanied by signs of unwanted increases in inflation or the emergence of other risks that could impede the attainment of the dual-mandate goals.

The Committee's longer-run goal for inflation remains 2 percent, unchanged from the 2012 statement.[4] The revised statement emphasizes that the FOMC's policy actions to achieve maximum employment and price stability will be most effective if longer-term inflation expectations remain well anchored at 2 percent. However, if inflation runs below 2 percent following economic downturns but never moves above 2 percent even when the economy is strong, then, over time, inflation will average less than 2 percent. Households and businesses will come to expect this result, meaning that inflation expectations would tend to move below the 2 percent inflation goal and pull down realized inflation. Lower inflation expectations also pull down the level of nominal interest rates, further diminishing the scope for monetary policy to reduce the policy rate during a downturn and further worsening economic outcomes. To prevent inflation expectations from falling below 2 percent and the adverse cycle that could ensue, the 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."

The revised statement acknowledges that "sustainably achieving maximum employment and price stability depends on a stable financial system." Therefore, as with the 2012 statement, the Committee's policy decisions will take into account "its assessments of the balance of risks, including risks to the financial system that could impede the attainment" of the statutory goals.

The Committee concludes its revised statement by indicating its intention to undertake a review of the Federal Reserve's monetary policy strategy, tools, and communication practices roughly every five years. Conducting a review at regular intervals is a good institutional practice, provides valuable feedback, and enhances transparency and accountability.

from the Public (Washington: Board of Governors, June), https://www.federalreserve.gov/publications/files/fedlistens-report-20200612.pdf. In addition, see the box "Federal Reserve Review of Monetary Policy Strategy, Tools, and Communication Practices" in Board of Governors of the Federal Reserve System (2020), *Monetary Policy Report* (Washington: Board of Governors, February), pp. 40–41, https://www.federalreserve.gov/monetarypolicy/files/20200207_mprfullreport.pdf.

3. The most recent version of the 2012 statement is available on the Board's website at https://www.federalreserve.gov/monetarypolicy/files/FOMC_LongerRunGoals_201901.pdf.

4. The inflation goal is measured by the annual change in the price index for personal consumption expenditures. The statement says: "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."

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. In addition, the minutes of the January 2021 FOMC meeting noted the importance attached to clear communications about the Committee's assessment of progress toward its longer-run goals well in advance of the time when progress could be judged substantial enough to warrant a change in the pace of purchases.[16]

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

The ongoing public health crisis continues to weigh on economic activity, employment, and inflation, and it poses considerable risks to the economic outlook. 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 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 evaluating 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. Such prescriptions can provide useful benchmarks for the FOMC. Although 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, some principles of good monetary policy can be illustrated by these policy rules (see the box "Monetary Policy Rules and Shortfalls from Maximum Employment").

The size of the Federal Reserve's balance sheet has grown since the end of June, reflecting continued asset purchases of U.S. Treasury securities and agency mortgage-backed securities

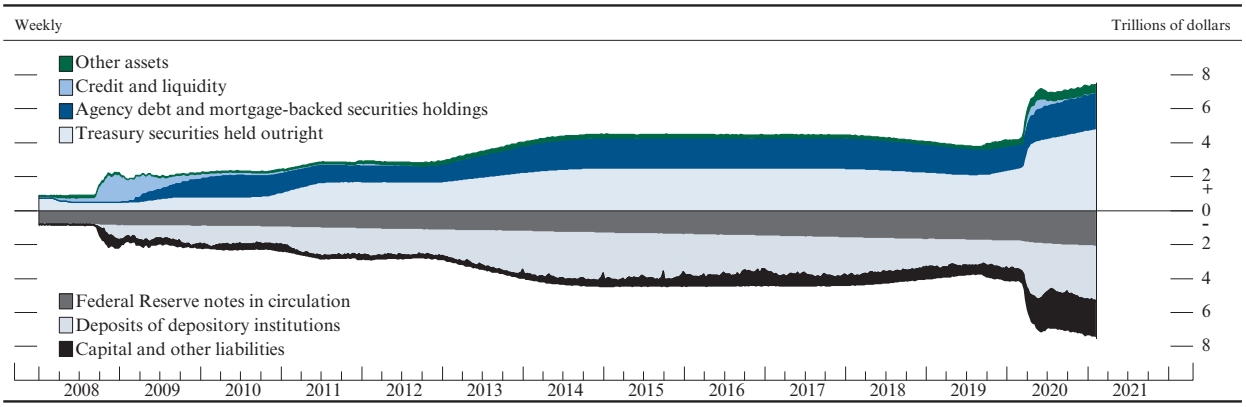
The Federal Reserve's balance sheet has grown to $7.4 trillion from $7 trillion at the end of June, reflecting continued asset purchases to help foster accommodative financial conditions and smooth market functioning, thereby supporting the flow of credit to households and businesses (figure 50). The 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. Agency commercial mortgage-backed securities purchases have also continued, but in very small amounts.

The increase in asset holdings on the Federal Reserve's balance sheet due to Treasury securities and agency MBS purchases has been partially offset by declines in several other asset categories. Outstanding balances at many of the Federal Reserve's emergency liquidity and credit facilities have declined since June.[17]

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

17. A list of funding, credit, liquidity, and loan 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.

50. Federal Reserve assets and liabilities



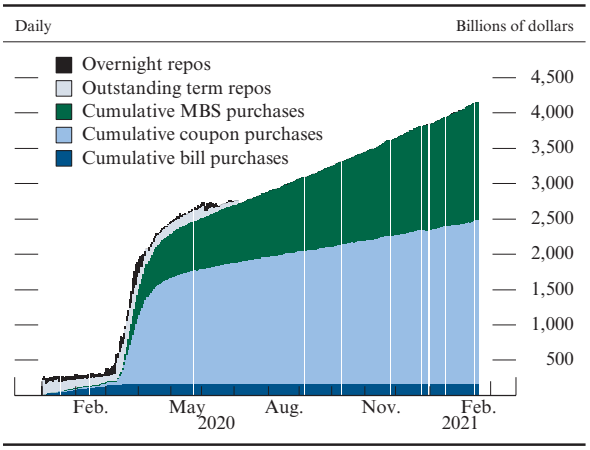
NOTE: "Agency debt and mortgage-backed securities holdings" includes agency residential mortgage-backed securities and agency commercial mortgage-backed securities. "Credit and liquidity facilities" consists of primary, secondary, and seasonal credit; term auction credit; central bank liquidity swaps; 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 February 10, 2021. Key identifies shaded areas in order from top to bottom.

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

In particular, outstanding balances for the Primary Dealer Credit Facility, Commercial Paper Funding Facility, and Money Market Mutual Fund Liquidity Facility have all fallen to near zero. Draws on central bank liquidity swap lines have decreased substantially, and, despite continued large-scale offerings, usage of repurchase operations has been essentially zero since their minimum bid rate was increased in mid-June (figure 51).

The expansion in the balance sheet was accompanied by a substantial increase in Federal Reserve liabilities, including reserve balances held by depository institutions as well as nonreserve liabilities such as currency and other deposits.

51. Federal Reserve open market operations



NOTE: The data are at a business-day frequency, excluding federal holidays. The data begin January 1, 2020. Repo is repurchase agreement. MBS is mortgage-backed security. Key identifies bars in order from top to bottom.

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

The Federal Reserve concluded the review of its strategic framework for monetary policy in the second half of 2020

Over 2019 and 2020, the Federal Reserve conducted a broad review of the monetary policy strategy, tools, and communication practices it uses to pursue its statutory dual-mandate goals of maximum employment and price stability. In addition to the release of

the revised Statement on Longer-Run Goals and Monetary Policy Strategy in August (see the box "The FOMC's Revised Statement on Longer-Run Goals and Monetary Policy Strategy"), analytical work that was prepared by Federal Reserve System staff and that served as background to the review was released to the public.[18]

In December, two changes were made to the Summary of Economic Projections (SEP) to enhance the information provided to the public. First, the release of the full set of SEP exhibits was accelerated by three weeks: Starting with the December 2020 meeting, the FOMC began releasing all SEP exhibits on the day of the policy decision (following the conclusion of an FOMC meeting) rather than with the release of the FOMC meeting minutes. As such, the written summary of the projections that had been included as an addendum to the minutes of the corresponding FOMC meeting was discontinued. Second, two new exhibits were added that display a time series of diffusion indexes for participants' judgments of uncertainty and risks. These diffusion indexes illustrate how FOMC participants' assessments of uncertainties and risks have evolved over time.

18. A report on the *Fed Listens* initiative, a key component of the review process, was released in June 2020 and is available on the Board's website at https://www.federalreserve.gov/publications/files/fedlistens-report-20200612.pdf. The analytical materials prepared by System staff are accessible from the Board's main webpage on the review (https://www.federalreserve.gov/monetarypolicy/review-of-monetary-policy-strategy-tools-and-communications.htm).

Monetary Policy Rules and Shortfalls from Maximum Employment

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 policy rate prescriptions derived from a variety of policy rules as part of their monetary policy deliberations without mechanically following the prescriptions of any particular rule. Most rules analyzed in the research literature respond to deviations—both positive and negative—of resource utilization from its longer-run level because their design was informed by historical periods and economic models in which high resource utilization and a strong labor market are accompanied by inflation pressure and in which policy rates remain well above the effective lower bound (ELB).

Economic performance in recent decades, including during the previous economic expansion, has demonstrated that a strong labor market can be sustained without inducing an unwanted increase in inflation. During that expansion, the unemployment rate fell to low levels—it remained at or below 4 percent from early 2018 until the start of the pandemic—bringing many benefits to families and communities that, all too often, had been left behind, with no sign of excessive pressures on prices. The lack of undue inflation pressures during this period illustrates that a strong labor market, by itself, need not cause concern unless accompanied by signs of unwanted increases in inflation or the emergence of other risks that could impede the attainment of the Committee's goals. In addition, the expansion reinforced the view that assessments of the maximum level of employment are imprecise and may change over time.[1] Tightening monetary policy in the absence of evidence of excessive inflation pressures may result in an unwarranted loss of opportunity for many Americans, whereas if an undue increase in inflation were to arise, policymakers would have the tools to address such an increase. Reflecting these considerations, the Federal Open Market Committee's (FOMC) revised Statement on Longer-Run Goals and Monetary Policy Strategy refers to "shortfalls of employment" from the Committee's assessment of its maximum level rather than the "deviations of employment" used in the previous statement.[2] This change has important implications for the design of simple interest rate rules.

This discussion examines the prescriptions from a number of commonly studied monetary policy rules, along with the prescriptions from a modified simple rule that, all else being equal, would not call for increasing the policy rate as employment moves higher and unemployment drops below its estimated longer-run level. This modified rule aims to illustrate, in a simple way, the Committee's focus on shortfalls of employment from assessments of its maximum level. Other key changes to the Committee's monetary policy strategy, 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.

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.[3] 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 longer-run objective.

(continued on next page)

1. In recent years, forecasters covered by the Blue Chip Survey, as well as FOMC participants in the Summary of Economic Projections, have substantially reduced their implied estimates of the unemployment rate that is sustainable in the longer run. For a discussion, see the box "Monetary Policy Rules and Uncertainty in Monetary Policy Settings" in Board of Governors of the Federal Reserve System (2020), *Monetary Policy Report* (Washington: Board of Governors, February), pp. 33–37, https://www.federalreserve.gov/monetarypolicy/files/20200207_mprfullreport.pdf.

2. See the box "The FOMC's Revised Statement on Longer-Run Goals and Monetary Policy Strategy" (earlier in Part 2) for a discussion of this change and other changes made to the statement.

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

Monetary Policy Rules *(continued)*

Simple monetary policy rules also have important limitations. A first limitation is that many formulations of simple rules do not recognize that the ELB limits the extent that the policy rate can be lowered to support the economy, which may impart a downward bias to both inflation and inflation expectations. As part of the FOMC's revised strategy to mitigate the challenges posed by the ELB and anchor longer-term inflation expectations at 2 percent, the Committee states 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." None of the simple rules analyzed in this discussion take into account average inflation performance or developments in measures of inflation expectations. As such, they do not reflect this important aspect of the FOMC's monetary policy strategy.[4]

A second limitation is that simple rules respond to only a small set of economic variables and thus necessarily abstract from many of the considerations taken into account by the FOMC. 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.[5] A third limitation of simple rules for the policy rate is that they generally do not recognize the fact 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 near or at the ELB.

4. For a discussion of policy strategies that seek to make up for past inflation shortfalls, see Jonas Arias, Martin Bodenstein, Hess Chung, Thorsten Drautzburg, and Andrea Raffo (2020), "Alternative Strategies: How Do They Work? How Might They Help?" Finance and Economics Discussion Series 2020-068 (Washington: Board of Governors of the Federal Reserve System, August), https://dx.doi.org/10.17016/FEDS.2020.068; and James Hebden, Edward P. Herbst, Jenny Tang, Giorgio Topa, and Fabian Winkler (2020), "How Robust Are Makeup Strategies to Key Alternative Assumptions?" Finance and Economics Discussion Series 2020-069 (Washington: Board of Governors of the Federal Reserve System, August), https://dx.doi.org/10.17016/FEDS.2020.069.

5. See Lael Brainard (2020), "Achieving a Broad-Based and Inclusive Recovery," speech delivered at "Post-COVID—Policy Challenges for the Global Economy," Society of Professional Economists Annual Online Conference (via webcast), October 21, https://www.federalreserve.gov/newsevents/speech/brainard20201021a.htm.

Policy Rules: Historical Prescriptions

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. They are also subject to the associated limitations. Thus, the balanced-approach (shortfalls) rule, as is the case with all simple rules, does not fully capture the monetary policy strategy that the FOMC announced in August 2020.

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 affecting estimates of the unemployment rate gap. In addition, all of the rules include the

(continued)

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 in 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 rate gap instead, because that gap better captures the FOMC's statutory goal to promote maximum employment. However, movements in these alternative measures of resource utilization are highly correlated. For more information, see the note below figure A.

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	$R_t^{BAS} = r_t^{LR} + \pi_t + 0.5(\pi_t - \pi^{LR}) + 2min\{(u_t^{LR} - u_t), 0\}$
Adjusted Taylor (1993) rule	$R_t^{T93adj} = max\{R_t^{T93} - Z_t, \text{ELB}\}$
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^{BAS}, 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 four-quarter price inflation for quarter t, u_t is the unemployment rate in quarter t, and r_t^{LR} is the level of the neutral real federal funds rate in the longer run that is expected to be consistent with sustaining maximum employment and inflation at the FOMC's 2 percent longer-run objective, denoted 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 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 gap. The rules are implemented as responding to core 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.

difference between inflation and the FOMC's longer-run objective of 2 percent. All but the first-difference rule include an estimate of the neutral real interest rate in the longer run (r_t^{LR}).[8]

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.

Contrary to 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 only a gradual return of the policy rate to the (positive) levels prescribed by the standard Taylor (1993) rule after the economy begins to recover.

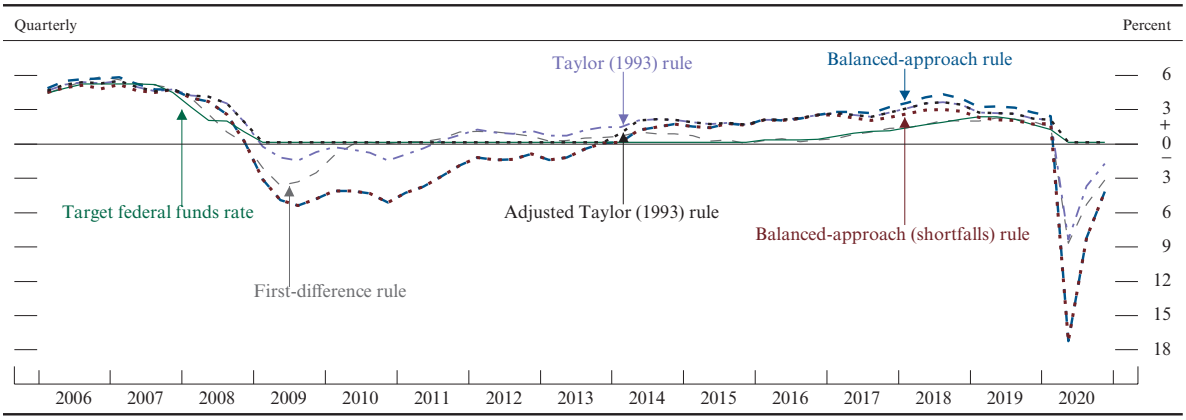
Figure B shows historical prescriptions for the federal funds rate from the five rules. For each period, the figure reports the policy rates prescribed by the rules, taking as given the prevailing economic conditions and estimates of u_t^{LR} and r_t^{LR} at the time. The four rules whose formulas do not impose the ELB imply prescriptions of strongly negative policy rates in response to the pandemic-driven recession, well below their respective troughs in the 2008–09 recession. These deeply negative prescribed policy rates show the extent to which policymakers' ability to support the economy through cuts in the policy rate was constrained by

(continued on next page)

8. 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 expression of 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.

Monetary Policy Rules *(continued)*

B. Historical federal funds rate prescriptions from simple policy rules



NOTE: The rules use historical values of the federal funds rate, core personal consumption expenditure 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.

the ELB during the pandemic-driven recession—a constraint that helped motivate the FOMC's other policy actions at the time, including forward guidance and asset purchases.

Regarding the recovery from the 2008–09 recession, all of the simple rules shown here prescribe departure from the ELB well before the FOMC determined that it was appropriate to do so. The FOMC's judgment that it was appropriate to maintain a more accommodative path of the federal funds rate than prescribed by these rules was informed by a wide range of information, including measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial and international developments.

The balanced-approach (shortfalls) rule calls for lower policy rates than the balanced-approach rule at times when unemployment is below its estimated longer-run level, thus providing somewhat more policy accommodation during the 2006–07 period and from late 2016 until the start of the pandemic. The fact that the policy rate prescriptions for the balanced-approach and balanced-approach (shortfalls) rules coincide from the 2008–09 recession up to the end of 2016 reflects the slow recovery in this period, during which unemployment remained above real-time estimates of its longer-run level.

Although these two rules prescribe identical policy rates over most of the period shown, including departure from the ELB about two years before the actual departure in December 2015, one should not conclude that they generally offer a similar degree of policy accommodation. Had the previous economic expansion not been cut short by the pandemic, the balanced-approach (shortfalls) rule would likely have continued to prescribe a lower policy rate than the balanced-approach rule. In addition, knowledge on the part of households and businesses that policymakers will respond to shortfalls rather than deviations from maximum employment can, in practice, help foster more accommodative financial conditions even when employment is below its maximum level because financial conditions are affected by the expected path of the policy rate. Expectations of lower policy rates in the future—once employment has recovered—can reduce longer-term interest rates, support accommodative financial conditions, and encourage aggregate spending in the present. These observations underline the importance of communication about future policy actions and demonstrate how a shift in focus to employment shortfalls, in the context of a simple rule, can provide more policy accommodation—even during times like today when employment remains depressed.

Part 3
Summary of Economic Projections

The following material was released after the conclusion of the December 15–16, 2020, meeting of the Federal Open Market Committee.

In conjunction with the Federal Open Market Committee (FOMC) meeting held on December 15–16, 2020, 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 2020 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.

Beginning with the December 2020 FOMC meeting, all Summary of Economic

Table 1. Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents, under their individual assumptions of projected appropriate monetary policy, December 2020

Percent

Variable	Median[1]					Central tendency[2]					Range[3]				
	2020	2021	2022	2023	Longer run	2020	2021	2022	2023	Longer run	2020	2021	2022	2023	Longer run
Change in real GDP	-2.4	4.2	3.2	2.4	1.8	-2.5–-2.2	3.7–5.0	3.0–3.5	2.2–2.7	1.7–2.0	-3.3–-1.0	0.5–5.5	2.5–4.0	2.0–3.5	1.6–2.2
September projection	-3.7	4.0	3.0	2.5	1.9	-4.0–-3.0	3.6–4.7	2.5–3.3	2.4–3.0	1.7–2.0	-5.5–1.0	0.0–5.5	2.0–4.5	2.0–4.0	1.6–2.2
Unemployment rate	6.7	5.0	4.2	3.7	4.1	6.7–6.8	4.7–5.4	3.8–4.6	3.5–4.3	3.9–4.3	6.6–6.9	4.0–6.8	3.5–5.8	3.3–5.0	3.5–4.5
September projection	7.6	5.5	4.6	4.0	4.1	7.0–8.0	5.0–6.2	4.0–5.0	3.5–4.4	3.9–4.3	6.5–8.0	4.0–8.0	3.5–7.5	3.5–6.0	3.5–4.7
PCE inflation	1.2	1.8	1.9	2.0	2.0	1.2	1.7–1.9	1.8–2.0	1.9–2.1	2.0	1.1–1.4	1.2–2.3	1.5–2.2	1.7–2.2	2.0
September projection	1.2	1.7	1.8	2.0	2.0	1.1–1.3	1.6–1.9	1.7–1.9	1.9–2.0	2.0	1.0–1.5	1.3–2.4	1.5–2.2	1.7–2.1	2.0
Core PCE inflation[4]	1.4	1.8	1.9	2.0		1.4	1.7–1.8	1.8–2.0	1.9–2.1		1.3–1.5	1.5–2.3	1.6–2.2	1.7–2.2	
September projection	1.5	1.7	1.8	2.0		1.3–1.5	1.6–1.8	1.7–1.9	1.9–2.0		1.2–1.6	1.5–2.4	1.6–2.2	1.7–2.1	
Memo: Projected appropriate policy path															
Federal funds rate	0.1	0.1	0.1	0.1	2.5	0.1	0.1	0.1	0.1–0.4	2.3–2.5	0.1	0.1	0.1–0.4	0.1–1.1	2.0–3.0
September projection	0.1	0.1	0.1	0.1	2.5	0.1	0.1	0.1	0.1–0.4	2.3–2.5	0.1	0.1	0.1–0.6	0.1–1.4	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 September projections were made in conjunction with the meeting of the Federal Open Market Committee on September 15–16, 2020. One participant did not submit longer-run projections for the change in real GDP, the unemployment rate, or the federal funds rate in conjunction with the September 15–16, 2020, meeting, and one participant did not submit such projections in conjunction with the December 15–16, 2020, 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.

Table 2. Average historical projection error ranges
Percentage points

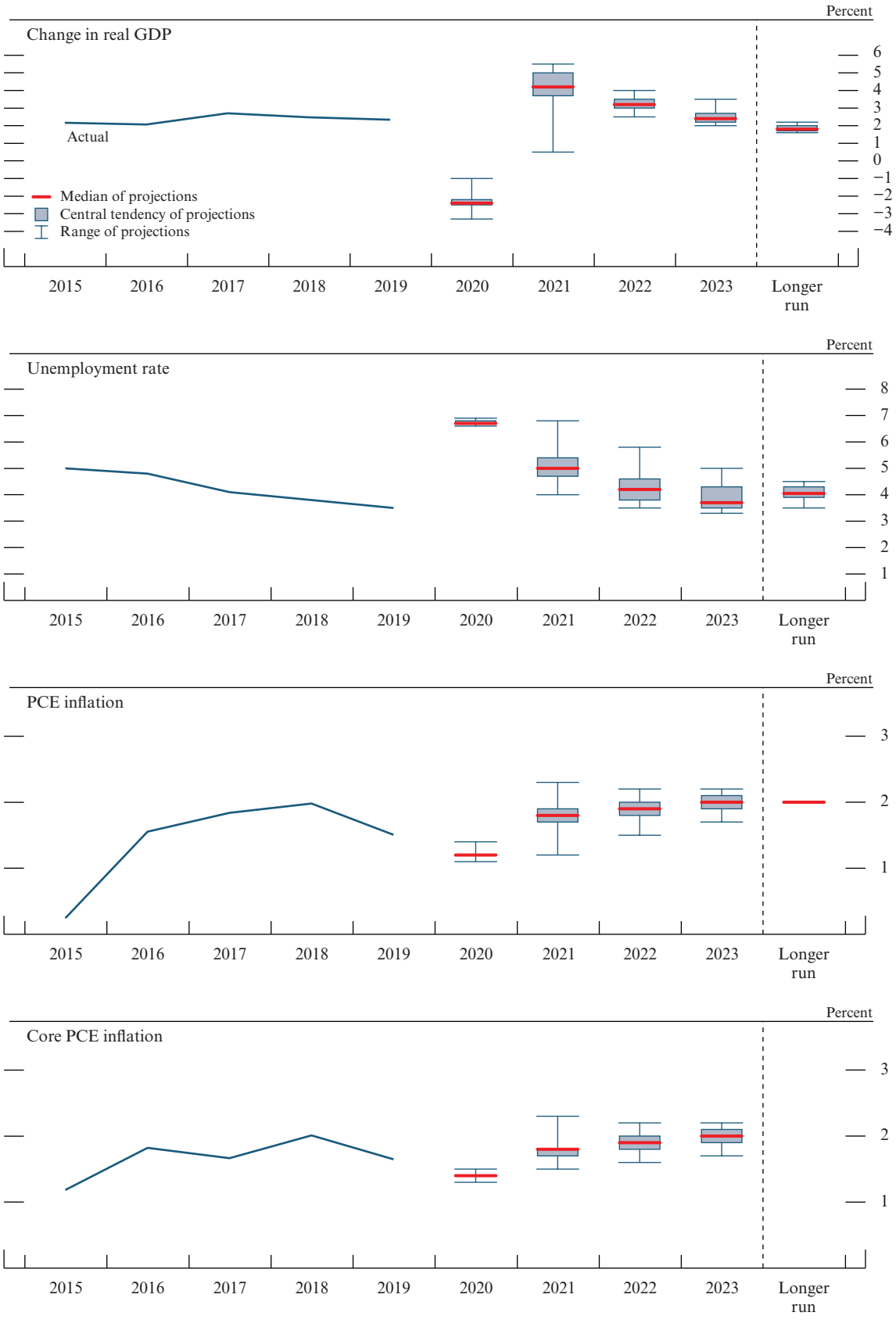
Variable	2020	2021	2022	2023
Change in real GDP[1]	±0.8	±1.5	±1.9	±2.0
Unemployment rate[1]	±0.1	±0.8	±1.4	±1.9
Total consumer prices[2]	±0.2	±0.9	±1.0	±0.9
Short-term interest rates[3]	±0.1	±1.4	±2.0	±2.4

NOTE: Error ranges shown are measured as plus or minus the root mean squared error of projections for 2000 through 2019 that were released in the winter by various private and government forecasters. As described in the box "Forecast Uncertainty," under certain assumptions, there is about a 70 percent probability that actual outcomes for real GDP, unemployment, consumer prices, and the federal funds rate will be in ranges implied by the average size of projection errors made in the past. For more information, see David Reifschneider and Peter Tulip (2017), "Gauging the Uncertainty of the Economic Outlook Using Historical Forecasting Errors: The Federal Reserve's Approach," Finance and Economics Discussion Series 2017-020 (Washington: Board of Governors of the Federal Reserve System, February), https://dx.doi.org/10.17016/FEDS.2017.020.

1. Definitions of variables are in the general note to table 1.
2. Measure is the overall consumer price index, the price measure that has been most widely used in government and private economic forecasts. Projections are percent changes on a fourth quarter to fourth quarter basis.
3. For Federal Reserve staff forecasts, measure is the federal funds rate. For other forecasts, measure is the rate on 3-month Treasury bills. Projection errors are calculated using average levels, in percent, in the fourth quarter.

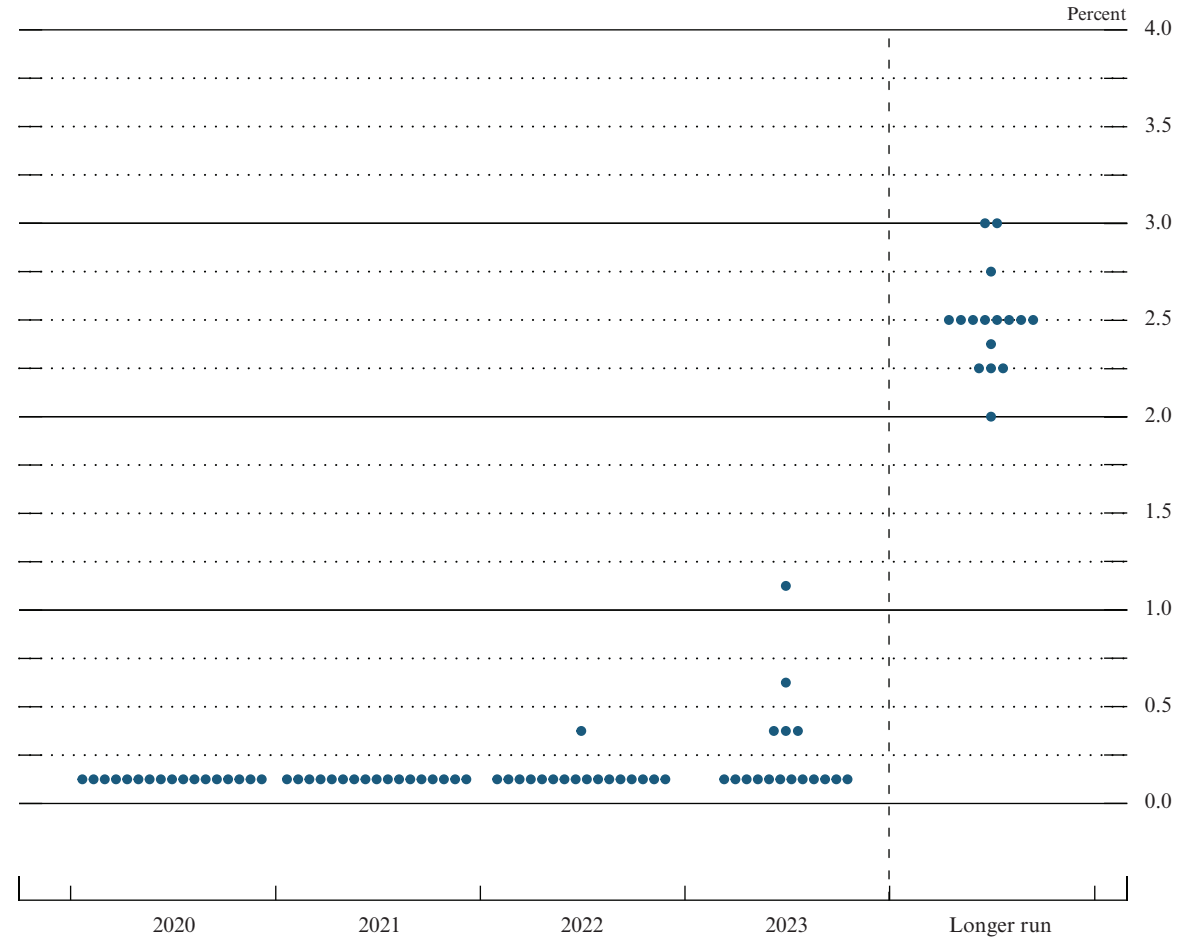
Projections charts and tables previously released with the minutes of a meeting will be released following the conclusion of an FOMC meeting. That is, the release of the distribution of participants' projections (Figures 3.A. through 3.E.), participants' assessments of uncertainty and risks associated with the projections (Figures 4.A. through 4.C. and Figure 5), and Table 2 and associated box, which describe projection error ranges, have been accelerated by three weeks. Two new exhibits, Figures 4.D. and 4.E., have been added to further enhance the information provided on uncertainty and risks by showing how FOMC participants' assessments of uncertainties and risks have evolved over time.

Figure 1. Medians, central tendencies, and ranges of economic projections, 2020–23 and over the longer run



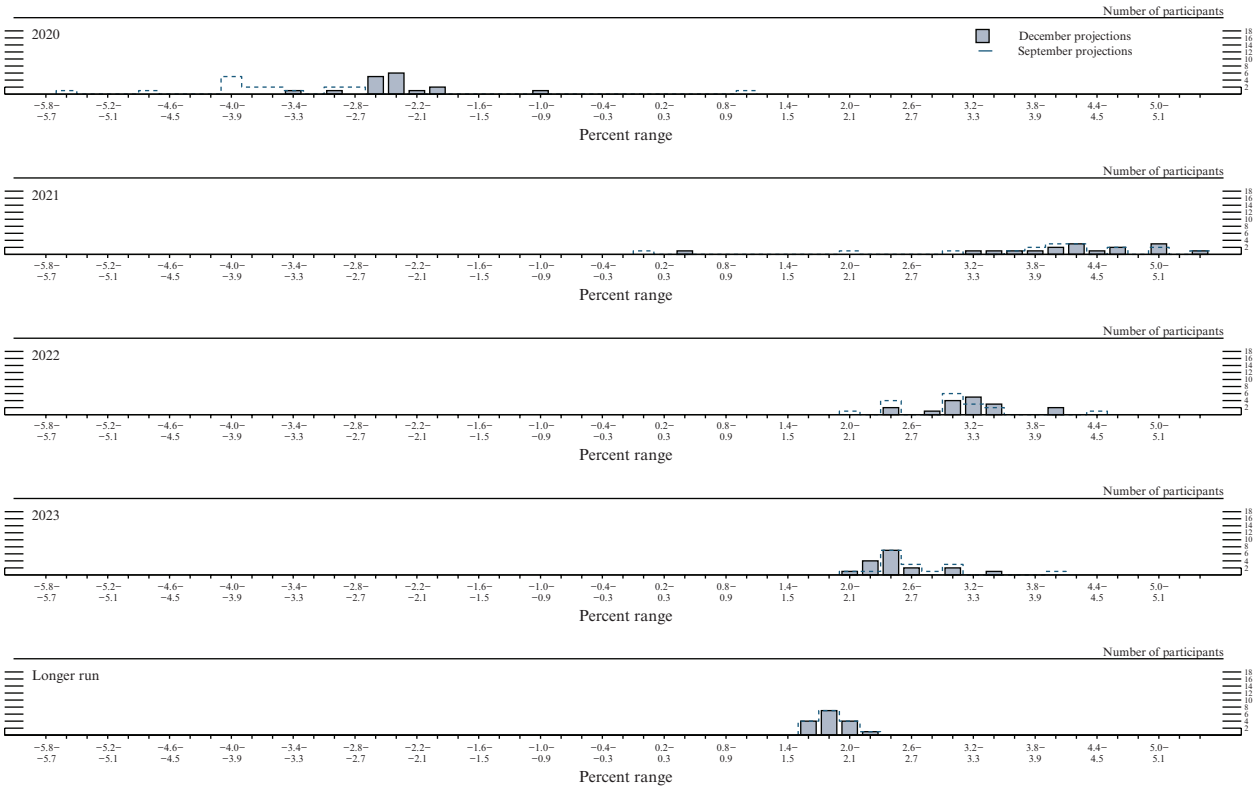
NOTE: Definitions of variables and other explanations are in the notes to table 1. The data for the actual values of the variables are annual.

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



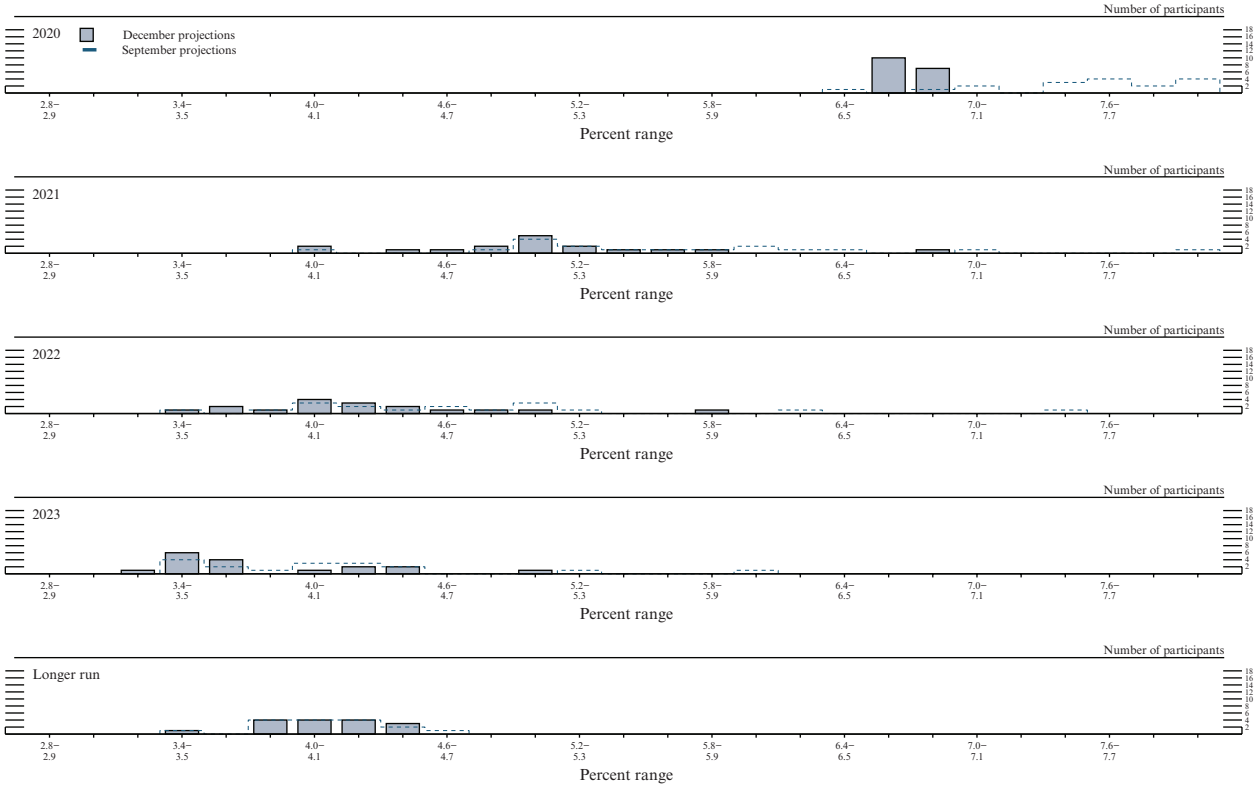
NOTE: Each shaded circle indicates the value (rounded to the nearest 1/8 percentage point) of an individual participant's judgment of the midpoint of the appropriate target range for the federal funds rate or the appropriate target level for the federal funds rate at the end of the specified calendar 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, 2020–23 and over the longer run



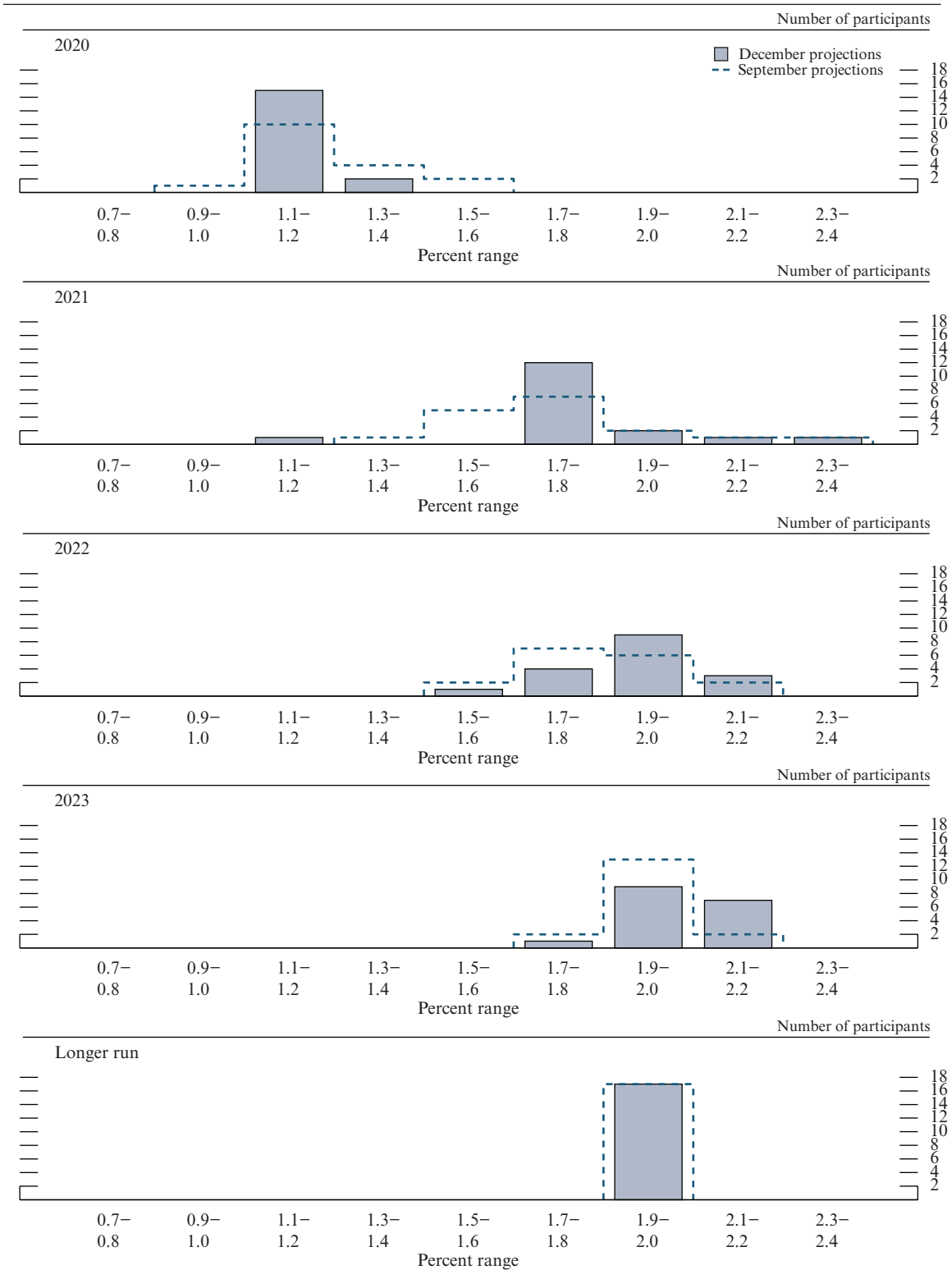
NOTE: Definitions of variables and other explanations are in the notes to table 1.

Figure 3.B. Distribution of participants' projections for the unemployment rate, 2020–23 and over the longer run



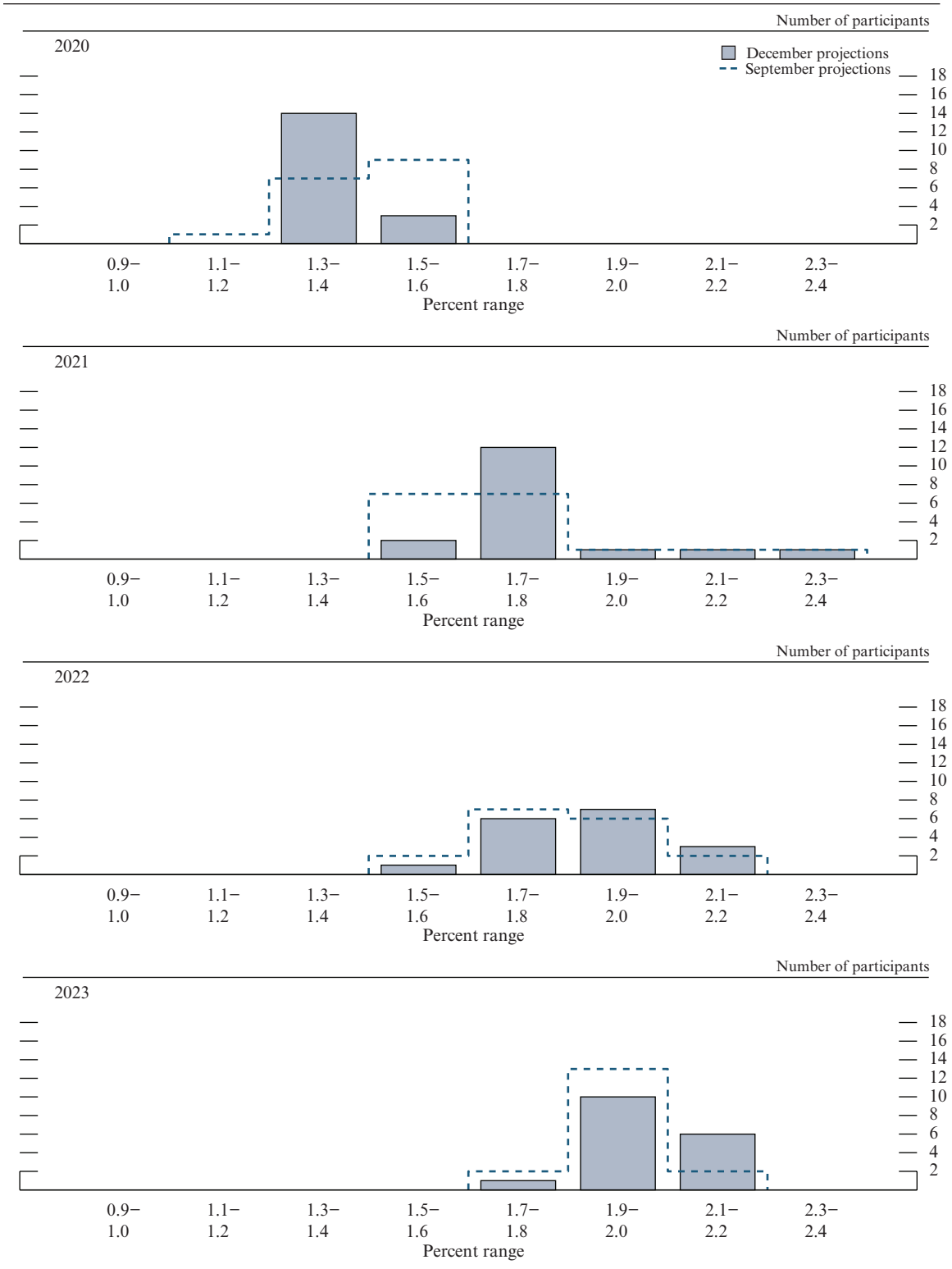
NOTE: Definitions of variables and other explanations are in the notes to table 1.

Figure 3.C. Distribution of participants' projections for PCE inflation, 2020–23 and over the longer run



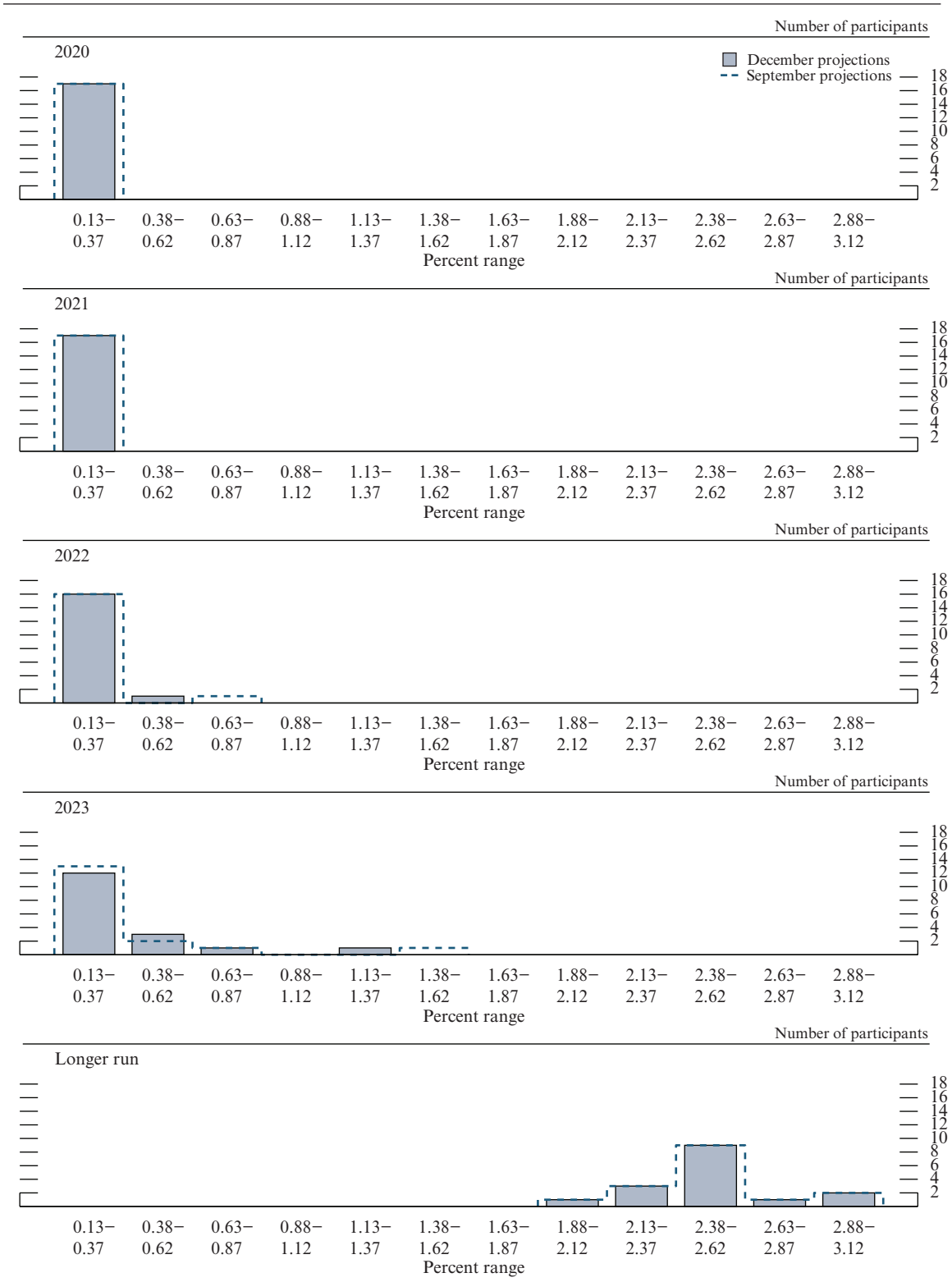
NOTE: Definitions of variables and other explanations are in the notes to table 1.

Figure 3.D. Distribution of participants' projections for core PCE inflation, 2020–23



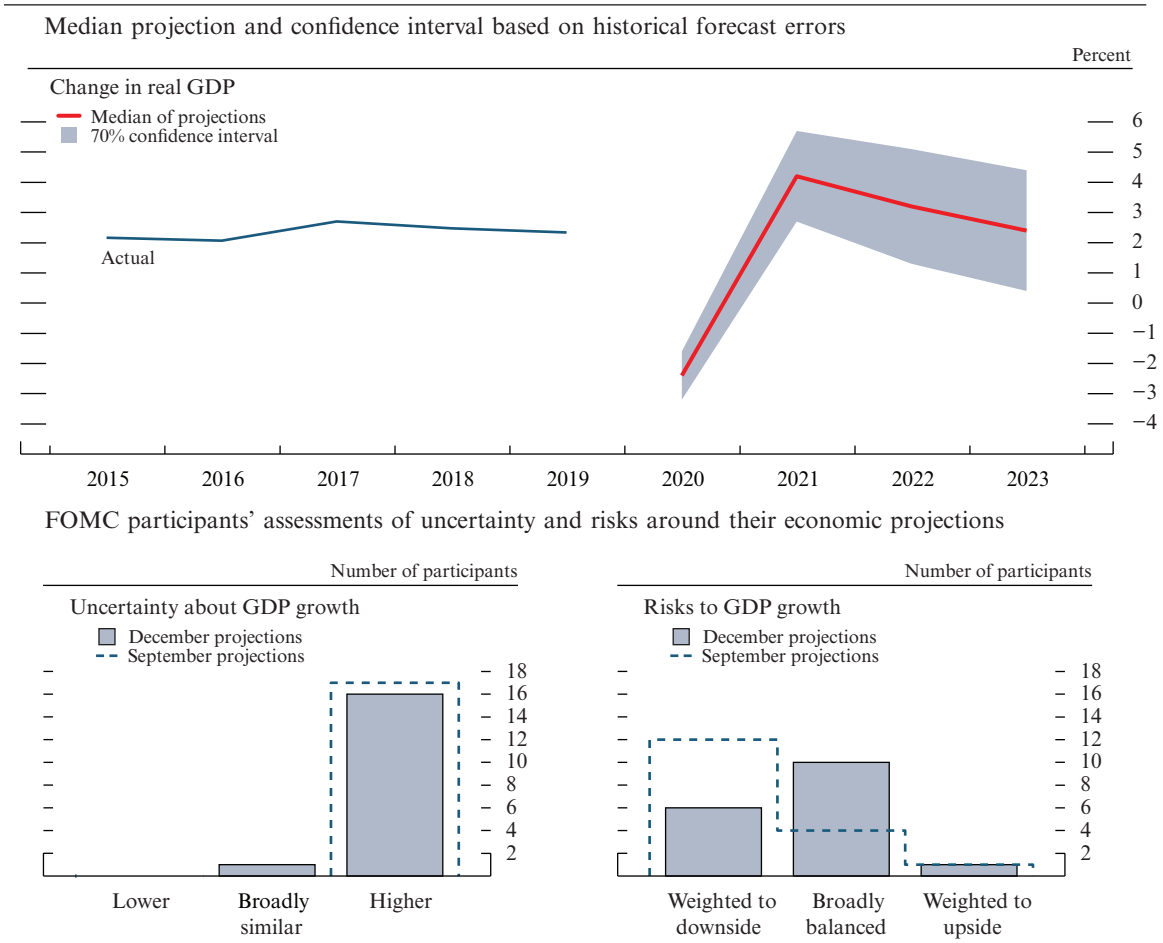
NOTE: Definitions of variables and other explanations are in the notes to table 1.

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, 2020–23 and over the longer run



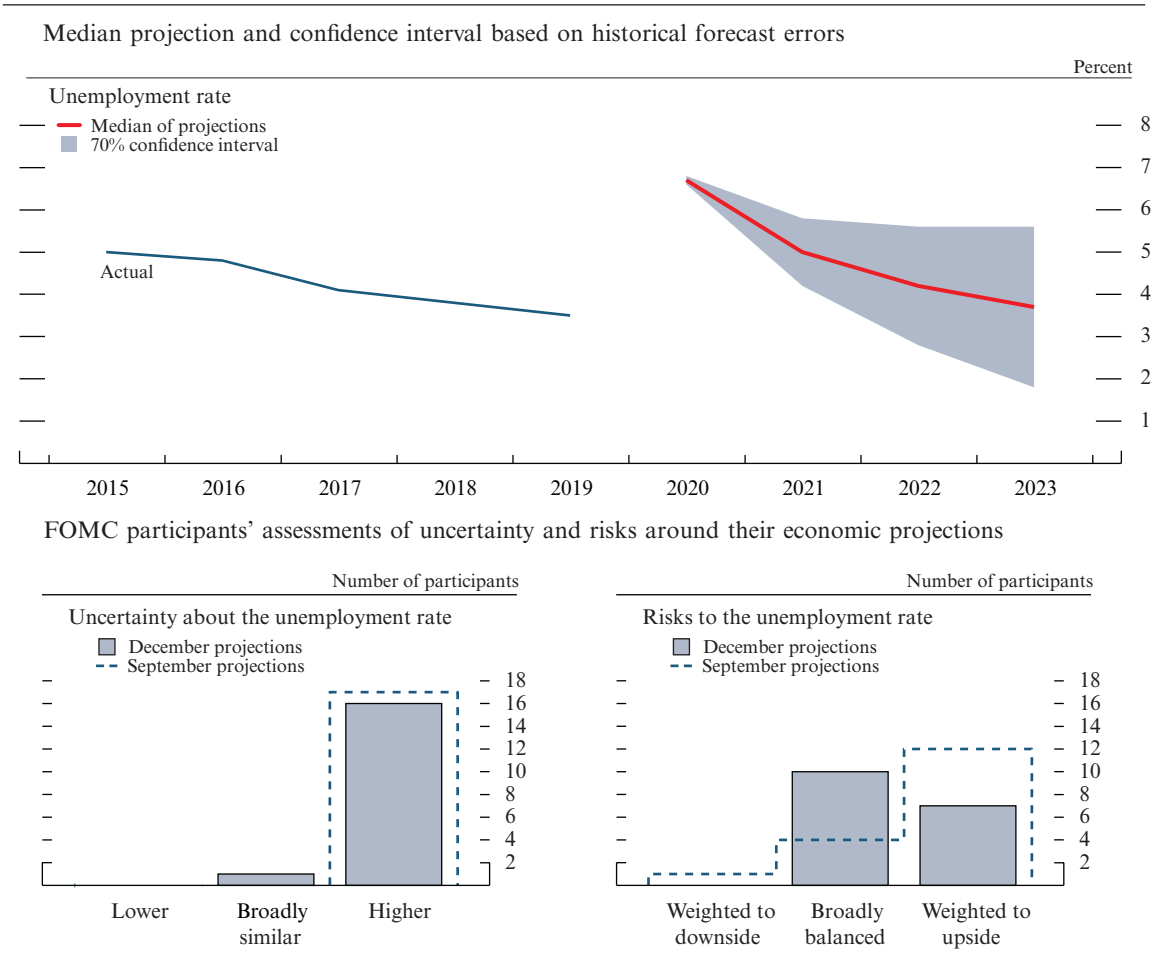
NOTE: Definitions of variables and other explanations are in the notes to table 1.

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



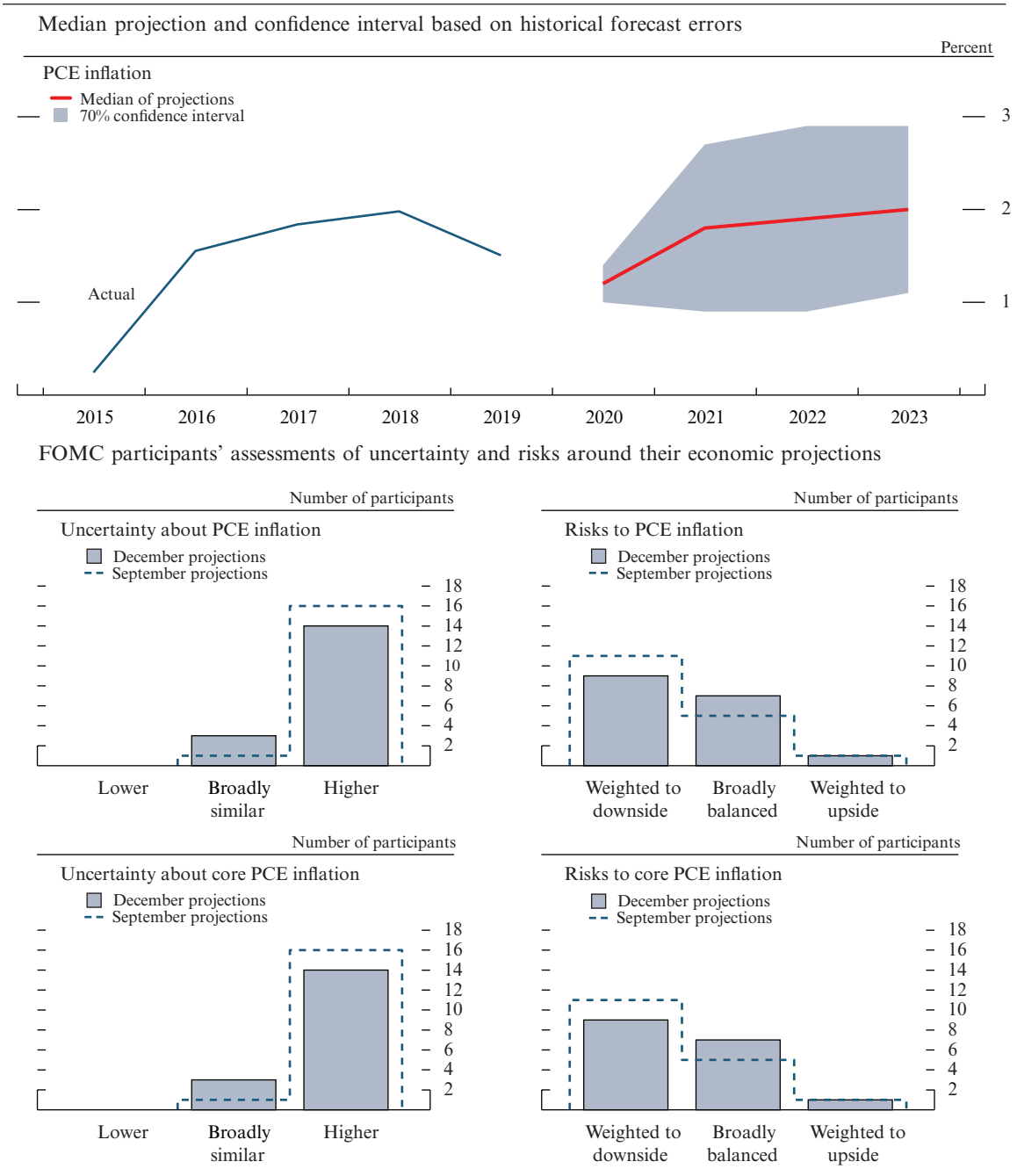
NOTE: The blue and red lines in the top panel show actual values and median projected values, respectively, of the percent change in real gross domestic product (GDP) from the fourth quarter of the previous year to the fourth quarter of the year indicated. The confidence interval around the median projected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



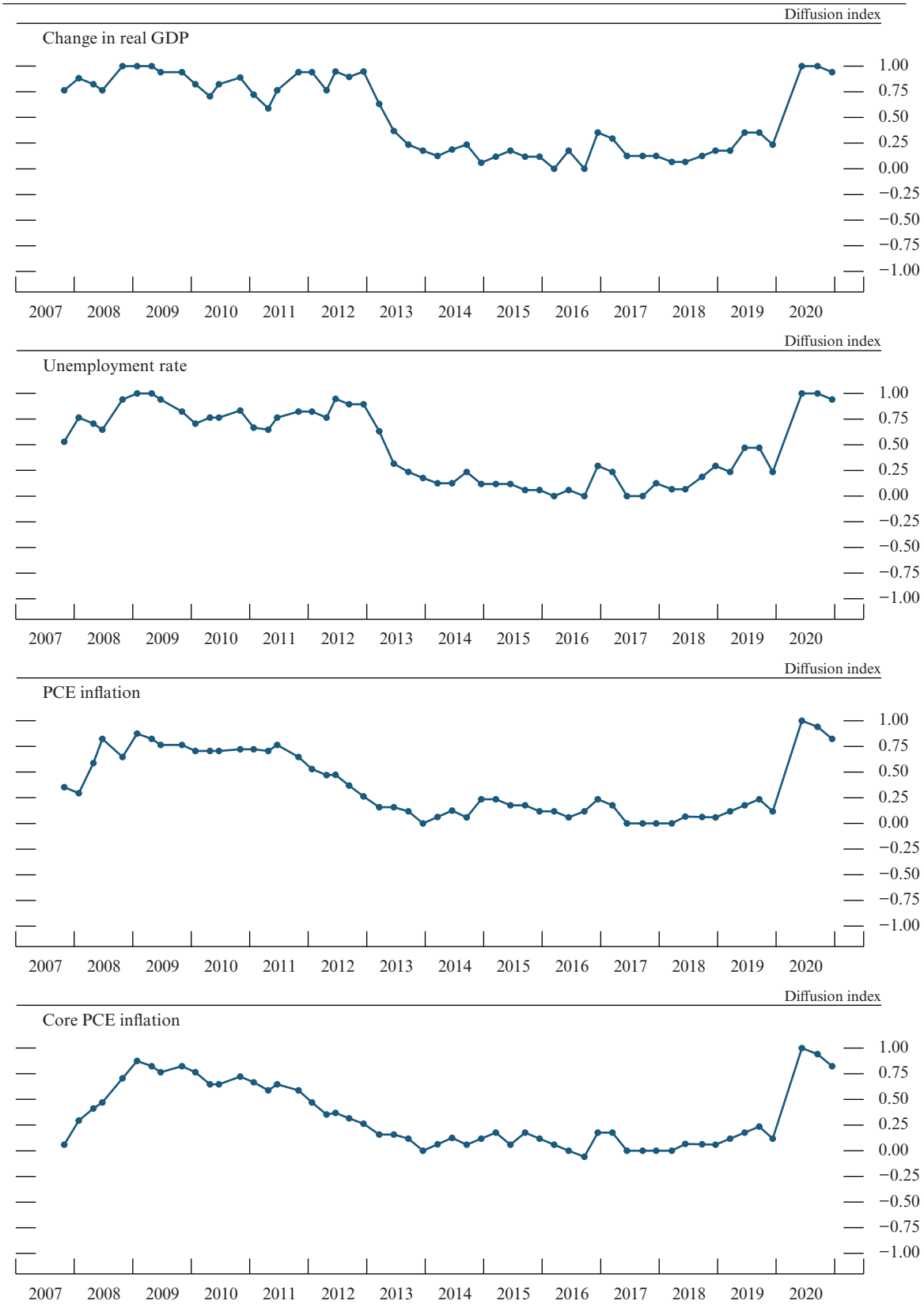
NOTE: The blue and red lines in the top panel show actual values and median projected values, respectively, of the average civilian unemployment rate in the fourth quarter of the year indicated. The confidence interval around the median projected values is assumed to be symmetric and is based on root 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



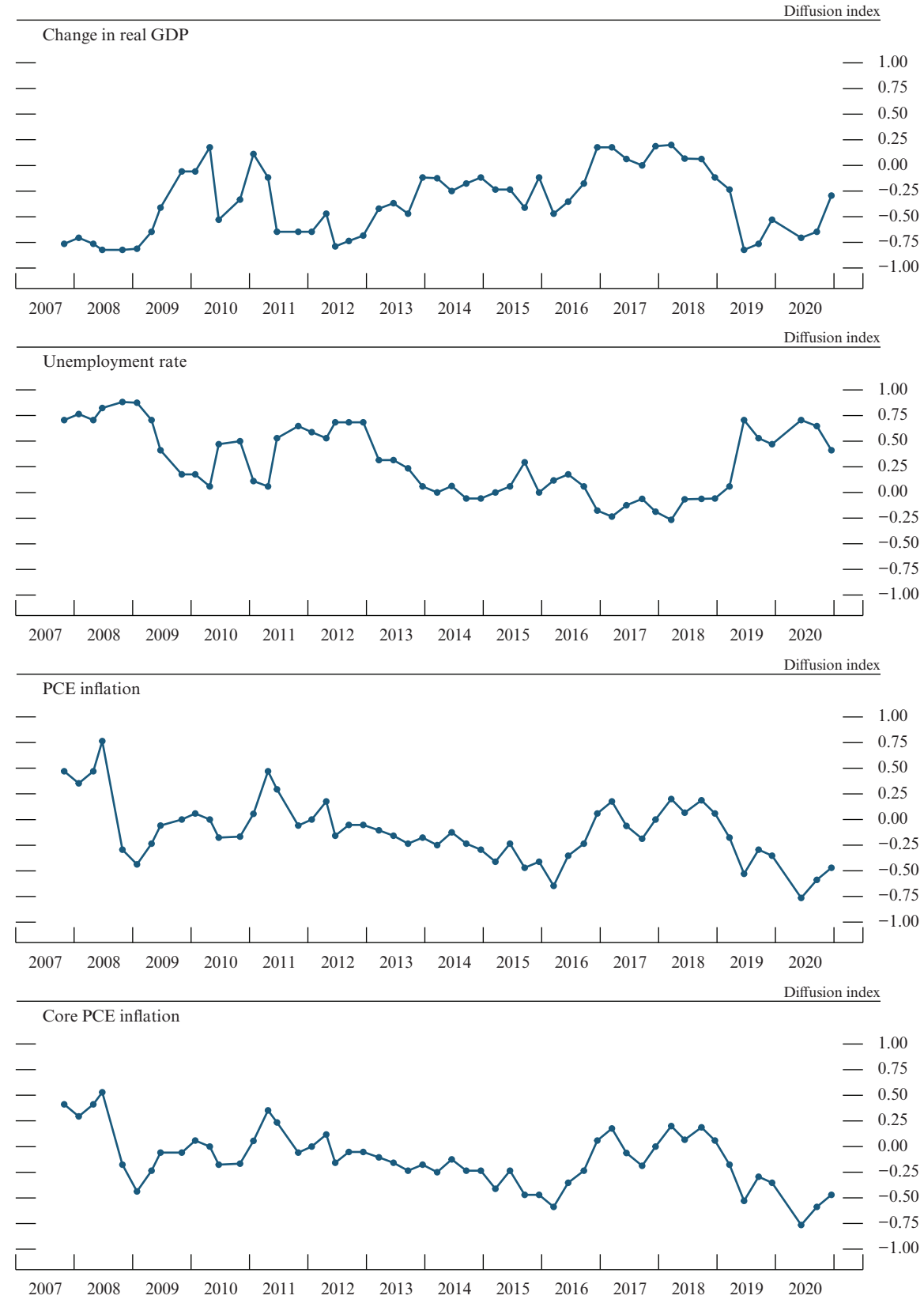
NOTE: The blue and red lines in the top panel show actual values and median projected values, respectively, of the percent change in the price index for personal consumption expenditures (PCE) from the fourth quarter of the previous year to the fourth quarter of the year indicated. The confidence interval 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



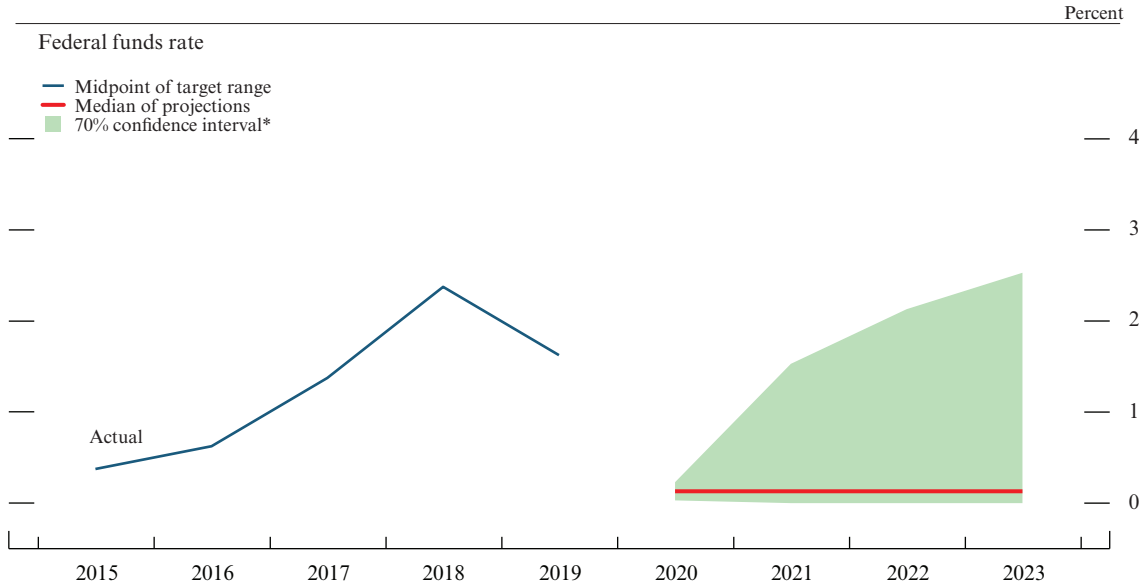
NOTE: For each SEP, participants provided responses to the question "Please indicate your judgment of the uncertainty attached to your projections relative to the levels of uncertainty over the past 20 years." Each point in the diffusion indexes represents the number of participants who responded "Higher" 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.

Forecast Uncertainty

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

Table 2 summarizes the average historical accuracy of a range of forecasts, including those reported in past *Monetary Policy Report*s and those prepared by the Federal Reserve Board's staff in advance of meetings of the Federal Open Market Committee (FOMC). The projection error ranges shown in the table illustrate the considerable uncertainty associated with economic forecasts. For example, suppose a participant projects that real gross domestic product (GDP) and total consumer prices will rise steadily at annual rates of, respectively, 3 percent and 2 percent. If the uncertainty attending those projections is similar to that experienced in the past and the risks around the projections are broadly balanced, the numbers reported in table 2 would imply a probability of about 70 percent that actual GDP would expand within a range of 2.2 to 3.8 percent in the current year, 1.5 to 4.5 percent in the second year, 1.1 to 4.9 percent in the third year, and 1.0 to 5.0 percent in the fourth year. The corresponding 70 percent confidence intervals for overall inflation would be 1.8 to 2.2 percent in the current year, 1.1 to 2.9 percent in the second year, 1.0 to 3.0 percent in the third year, and 1.1 to 2.9 percent in the fourth year. 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'

(continued)

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

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

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

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

Abbreviations

AFE	advanced foreign economy
BLS	Bureau of Labor Statistics
CARES Act	Coronavirus Aid, Relief, and Economic Security Act
CES	Current Employment Statistics
C&I	commercial and industrial
COVID-19	coronavirus disease 2019
CPFF	Commercial Paper Funding Facility
CPI	consumer price index
DPI	disposable personal income
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
GDP	gross domestic product
G-SIBs	global systemically important banks
LFPR	labor force participation rate
Main Street	Main Street Lending Program
MBS	mortgage-backed securities
MMLF	Money Market Mutual Fund Lending Facility
OPEC	Organization of the Petroleum Exporting Countries
PCE	personal consumption expenditures
PDCF	Primary Dealer Credit Facility
PPPLF	Paycheck Protection Program Liquidity Facility
QSS	Quarterly Services Survey
repo	repurchase agreement
RRE	residential real estate
SBA	Small Business Administration
SEP	Summary of Economic Projections
TIPS	Treasury Inflation-Protected Securities
VIX	implied volatility for the S&P 500 index