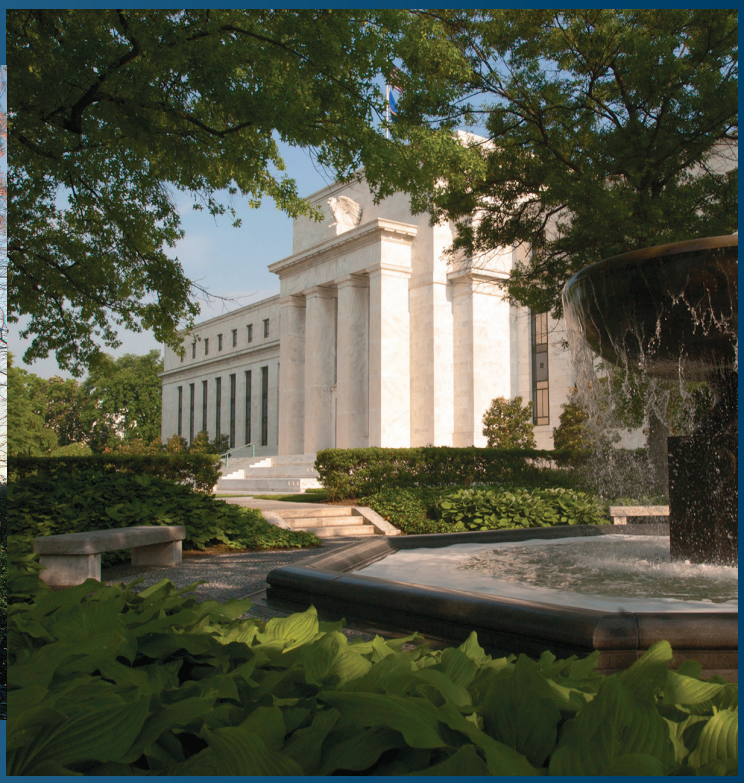
For use at 11:00 a.m. EDT
June 16, 2023

Monetary Policy Report

June 16, 2023



Board of Governors of the Federal Reserve System

Letter of Transmittal

Board of Governors of the
Federal Reserve System

Washington, D.C., June 16, 2023

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 reaffirmed effective January 31, 2023

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 4 p.m. EDT on June 14, 2023. Unless otherwise stated, the time series in the figures extend through, for daily data, June 13, 2023; for monthly data, May 2023; and, for quarterly data, 2023:Q1. In bar charts, except as noted, the change for a given period is measured to its final quarter from the final quarter of the preceding period.

Summary

Although inflation has moderated somewhat since the middle of last year, it remains well above the Federal Open Market Committee's (FOMC) objective of 2 percent. The labor market continues to be very tight, with robust job gains and the unemployment rate near historically low levels, though nominal wage growth has shown some signs of easing and job vacancies have declined. Real gross domestic product (GDP) growth was modest in the first quarter, despite a pickup in consumer spending. Bringing inflation back to 2 percent will likely require a period of below-trend growth and some softening of labor market conditions.

In response to high inflation, the FOMC continued to increase interest rates and reduce its securities holdings. The FOMC has raised the target range for the federal funds rate a further 75 basis points since the start of the year, bringing the range to 5 to 5¼ percent. In determining the extent of additional policy firming that may be appropriate to return inflation to 2 percent over time, the FOMC indicated that it will take into account the cumulative tightening of monetary policy, the lags with which monetary policy affects economic activity and inflation, and economic and financial developments. The Federal Reserve also continued to reduce its holdings of Treasury and agency mortgage-backed securities; these holdings have declined by about $420 billion since January, further tightening financial conditions.

The Federal Reserve is acutely aware that high inflation imposes significant hardship, especially on those least able to meet the higher costs of essentials. The FOMC is strongly committed to returning inflation to its 2 percent objective.

Recent Economic and Financial Developments

Inflation. Consumer price inflation, as measured by the 12-month change in the price index for personal consumption expenditures (PCE), was 4.4 percent in April, down from its peak of 7.0 percent last June but still well above the FOMC's 2 percent objective. Core PCE price inflation—which excludes volatile food and energy prices and is generally considered a better guide to the direction of future inflation—is also off its peak but was still 4.7 percent over the 12 months ending in April. As supply chain bottlenecks have eased and demand has stabilized, increases in core goods prices slowed considerably over the past year. Within core services prices, housing services inflation has been high, but the monthly changes have started to ease in recent months, consistent with the slower increases in rents for new tenants that have been observed since the second half of last year. For other core services, price inflation remains elevated and has not shown signs of easing, and prospects for slowing inflation may depend in part on a further easing of tight labor market conditions. Measures of longer-term inflation expectations are within the range of values seen in the decade before the pandemic and continue to be broadly consistent with the FOMC's longer-run objective of 2 percent, suggesting that high inflation is not becoming entrenched.

The labor market. The labor market has remained very tight, with job gains averaging 314,000 per month during the first five months of the year and the unemployment rate remaining near historical lows. Labor demand has eased in many sectors of the economy but continues to exceed the supply of available

workers, with job vacancies still elevated. Labor supply has improved, with a pickup in immigration and an improvement in the labor force participation rate, particularly among prime-age workers. Nominal wage gains continued to slow in the first half of 2023, but they remain above the pace consistent with 2 percent inflation over the longer term, given prevailing trends in productivity growth.

Economic activity. After the strong rebound in 2021 from the pandemic-induced recession, economic activity lost momentum last year, and growth in the first quarter of this year was modest as financial conditions continued to tighten. Real consumer spending grew at a solid pace in the first quarter but appears to be moderating as consumer financing conditions have tightened and consumer confidence has remained low. Real business fixed investment growth continued to slow in the first quarter, likely reflecting tighter financial conditions and weaker output growth, while manufacturing output has been roughly unchanged so far this year after having declined in the fourth quarter. Activity in the housing sector continued to contract in response to elevated mortgage rates, but several indicators appear to have bottomed out.

Financial conditions. Financial conditions have tightened further since January. The FOMC has raised the target range for the federal funds rate a further 75 basis points since January, and the market-implied expected path of the federal funds rate over the next year shifted up. Though yields on longer-term nominal Treasury securities were little changed, on net, over this period, the relatively high level of interest rates has weighed on financing activity. Business loans at banks grew since the start of 2023, but the pace of growth continued to slow as banks tightened standards and average borrowing costs rose. Investment-grade corporate bond issuance rebounded to a brisk pace in May, following a slowdown in March and April. Speculative-grade issuance rebounded as well but was still subdued by historical standards. While business credit quality remains strong, some indicators of future business defaults are somewhat elevated. For households, mortgage originations remained weak, although consumer loans (such as auto loans and credit cards) grew further. After having risen last year, delinquency rates leveled off in the first quarter for auto loans and continued to increase for credit card loans.

Financial stability. Despite concerns about profitability at some banks, the banking system remains sound and resilient. Most measures of valuation pressures in corporate securities markets remained near the middle of their historical distributions. By contrast, valuation pressures in commercial and residential real estate markets continued to be elevated. Borrowing by households and businesses grew a bit more slowly than GDP, leaving vulnerabilities arising from household and business debt largely unchanged at moderate levels. In the banking sector, heavy reliance on uninsured deposits, declining fair values of long-duration fixed-rate assets associated with higher interest rates, and poor risk management led to the failure of three domestic banks. Broad bank equity prices fell sharply as market participants reassessed the strength of some banks with similar risk profiles to those that failed. However, the broader banking sector maintained substantial loss-absorbing capacity and ample liquidity. In the nonbank financial sector, leverage at hedge funds remained elevated, and structural vulnerabilities associated with funding risk persisted at some money market funds and certain mutual funds. (See the box "Developments Related to Financial Stability" in Part 1.)

International developments. Following a slowdown at the end of 2022, foreign activity rebounded early this year. This rebound was driven in part by strong growth in China, as

the lifting of COVID-19 restrictions unleashed pent-up demand, though recent indicators suggest that momentum is slowing. Europe showed resilience to the energy price shock stemming from Russia's war against Ukraine. Foreign headline inflation continued to fall, driven by declines in retail energy prices. However, while energy inflation has moderated in many foreign economies, both food and core inflation remain elevated.

Since January, several major foreign central banks continued tightening their monetary policies, communicating concerns about elevated inflation and tight labor markets. That said, some central banks also emphasized the need to be cautious in their approach, given the lags of monetary policy and the uncertainty about the outlook for growth and inflation. The trade-weighted exchange value of the U.S. dollar is a touch lower.

Monetary Policy

In response to high inflation, the FOMC continued to increase the target range for the federal funds rate and reduce its securities holdings this year. Adjustments to both interest rates and the balance sheet are playing a role in firming the stance of monetary policy in support of the Federal Reserve's maximum-employment and price-stability goals.

Interest rate policy. The FOMC continued to increase the target range for the federal funds rate, bringing it to the current range of 5 to 5¼ percent. In light of the cumulative tightening of monetary policy and the lags with which monetary policy affects economic activity and inflation, the FOMC slowed the pace of policy tightening relative to last year. The FOMC will determine meeting by meeting the extent of additional policy firming that may be appropriate to return inflation to 2 percent over time, based on the totality of incoming data and their implications for the outlook for economic activity and inflation.

Balance sheet policy. The Federal Reserve has continued the process of significantly reducing its holdings of Treasury and agency securities in a predictable manner.[1] Beginning in June of last year, principal payments from securities held in the System Open Market Account (SOMA) have been reinvested only to the extent that they exceeded monthly caps. The Federal Reserve has reduced its securities holdings by about $420 billion since January. This decrease in assets was partially offset by liquidity provisions to the banking system following the banking-sector stresses in March.

Special Topics

Employment and earnings across groups. Strong labor demand over the past two years has particularly benefited historically more disadvantaged workers. As a result, many of the disparities in employment and wages across racial, ethnic, sex, and education groups, which had been exacerbated by the pandemic, have narrowed—in some cases to historically narrow ranges. Despite this narrowing, there remain significant disparities in absolute levels of employment and wages across groups. (See the box "Developments in Employment and Earnings across Demographic Groups" in Part 1.)

Bank stress and lending. Bank lending conditions have tightened notably over the past year, and bank loan growth has slowed, following the tightening of monetary policy that started in early 2022. Banking-sector strains in March 2023 reportedly led to further tightening in lending conditions at some banks. Results from the April 2023 Senior Loan Officer Opinion Survey on Bank Lending Practices show that banks expect to

1. See the May 4, 2022, press release regarding the Plans for Reducing the Size of the Federal Reserve's Balance Sheet, available on the Board's website at https://www.federalreserve.gov/newsevents/pressreleases/monetary20220504b.htm.

further tighten their lending standards over the remainder of 2023, with some banks reporting concerns about their liquidity positions, deposit outflows, and funding costs. Economic research suggests that tighter credit conditions at banks can have adverse effects on economic activity, but different studies find effects that vary in scope, magnitude, and timing. In terms of scope, the effects are also likely to differ across borrowers, economic sectors, and geographic areas, and they may be larger for sectors that depend more heavily on bank credit, such as the commercial real estate and the small business sectors. (See the box "Recent Developments in Bank Lending Conditions" in Part 1.)

Federal Reserve's balance sheet and money markets. The Federal Reserve continued to reduce the size of its SOMA portfolio. However, in March, amid banking-sector developments, borrowing from the discount window increased, and the Federal Reserve implemented a new facility, the Bank Term Funding Program (BTFP), to make additional funding available to eligible depository institutions. As a result of Federal Reserve lending through the BTFP, the discount window, and other credit extensions, the Federal Reserve's total assets have increased since March. Take-up in the overnight reverse repurchase agreement (ON RRP) facility remained elevated, as low rates on repurchase agreements persisted amid still abundant liquidity and limited Treasury bill supply. The ON RRP facility continued to serve its intended purpose of helping to provide a floor under short-term interest rates and supporting effective implementation of monetary policy. (See the box "Developments in the Federal Reserve's Balance Sheet and Money Markets" in Part 2.)

Monetary policy rules. Simple monetary policy rules, which prescribe a setting for the policy interest rate based on a small number of other economic variables, can provide useful guidance to policymakers. Since 2021, inflation has run well above the FOMC's 2 percent longer-run objective, and labor market conditions have been very tight over the past year. As a result, simple monetary policy rules have called for elevated levels of the federal funds rate. (See the box "Monetary Policy Rules in the Current Environment" in Part 2.)

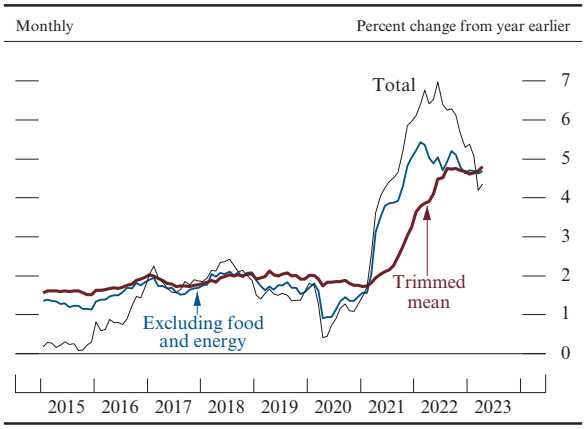
Part 1
Recent Economic and Financial Developments

Domestic Developments

Inflation has continued to decline but remains elevated, and progress has been uneven across categories

Inflation, as measured by the 12-month change in the price index for personal consumption expenditures (PCE), continued to step down, on net, in recent months, receding from its peak of 7.0 percent in June of last year to 4.4 percent in April, although it remained well above the Federal Open Market Committee's (FOMC) longer-run objective of 2 percent (figure 1). Core PCE prices—which exclude volatile food and energy prices—rose 4.7 percent over the 12 months to April, down from the 5.4 percent peak early last year but little changed since the end of the year, with outcomes that have varied widely across spending categories. The trimmed mean measure of PCE prices from the Federal Reserve Bank of Dallas also remained elevated, increasing 4.8 percent over the 12 months to April, little changed since last fall.

1. Personal consumption expenditures price indexes

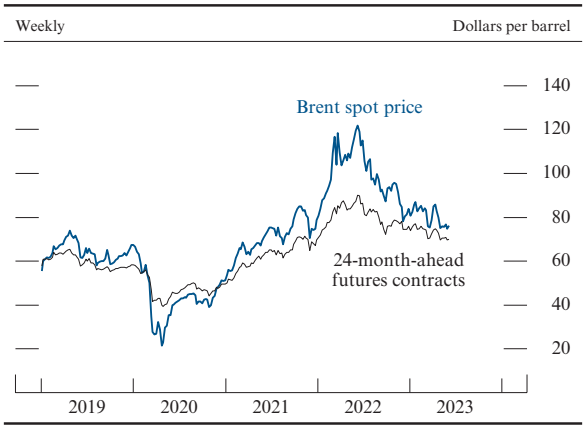


Note: The data extend through April 2023.
Source: For trimmed mean, Federal Reserve Bank of Dallas; for all else, Bureau of Economic Analysis; all via Haver Analytics.

Consumer energy prices have declined so far this year, while food prices have flattened out recently

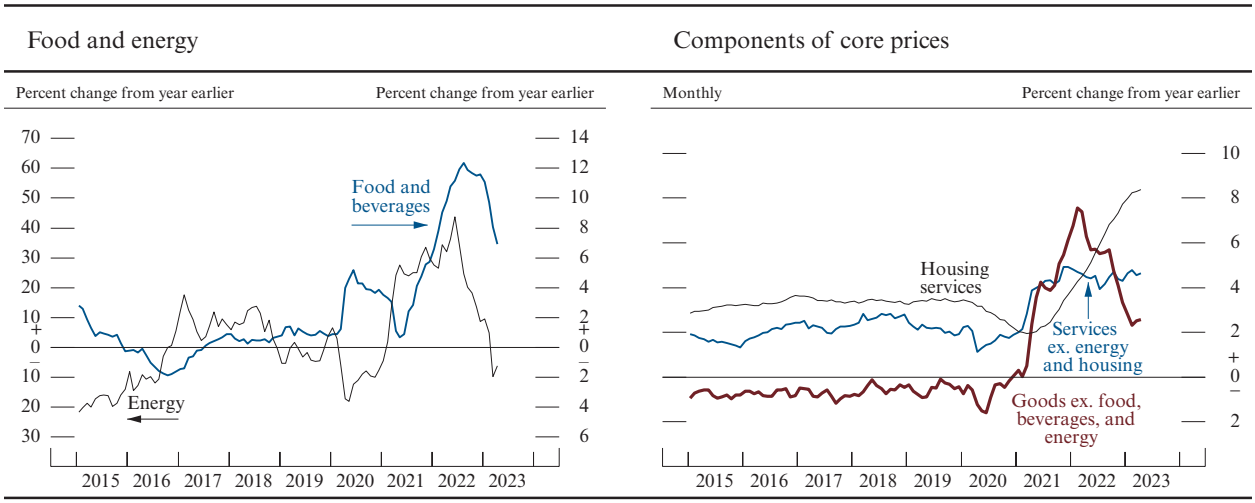
After declining in the second half of last year, oil prices have edged down further so far this year (figure 2). The lower oil prices appear to reflect weaker prospects for global growth. Meanwhile, prospects for supply have been mixed, with production cuts announced by OPEC (Organization of the Petroleum Exporting Countries) partly offset by the unexpected resilience of Russian oil production. Gasoline prices have edged down so far this year, and prices for natural gas and heating oil have declined more noticeably. All told, the PCE energy price index in April was

2. Spot and futures prices for crude oil



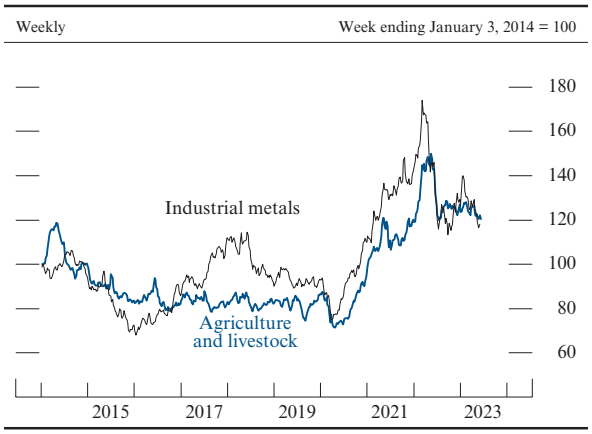
Note: The data are weekly averages of daily data and extend through June 9, 2023.
Source: ICE Brent Futures via Bloomberg.

3. Subcomponents of personal consumption expenditures price indexes



NOTE: The data are monthly and extend through April 2023.
SOURCE: Bureau of Economic Analysis via Haver Analytics.

4. Spot prices for commodities



NOTE: The data are weekly averages of daily data and extend through June 9, 2023.
SOURCE: For industrial metals, S&P GSCI Industrial Metals Spot Index; for agriculture and livestock, S&P GSCI Agriculture & Livestock Spot Index; both via Haver Analytics.

more than 6 percent below its level 12 months earlier (figure 3).

Food prices have flattened out in recent months, as prices of many agricultural commodities and livestock have come down from the highs reached at the start of Russia's war on Ukraine (figure 4). Partly reflecting these declines, grocery store price increases slowed to an annual rate of 2.6 percent over the six months ending in April, down sharply from the 11 percent pace recorded over the previous six months. This moderation brought the 12-month change down to 6.9 percent in April, a rate that is still quite elevated but well below the increase of nearly 12 percent recorded at the end of last year (as shown in figure 3).

Prices of both energy and food products are of particular importance for lower-income households, for which such necessities account for a large share of expenditures.

Core goods price increases continue to soften as supply bottlenecks ease and import price inflation falls . . .

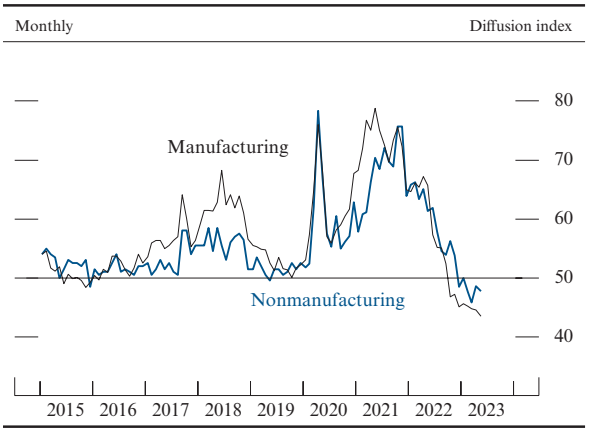
Outside of food and energy goods and services, recent inflation performance has

varied markedly across the core spending categories. Prices for core goods increased 2.6 percent over the 12 months ending in April, substantially below the 6.3 percent increase recorded 12 months earlier but still well above the average rate observed during the years before the pandemic (figure 3). Over the past year, supply chain issues have diminished, other capacity constraints have eased, and demand appears to have stabilized. Transportation costs have also moved down over the past year, and suppliers' delivery times have improved (figure 5). Core goods inflation has also been held down this year by the net decline in nonfuel import prices (figure 6). This decline likely reflects the earlier appreciation of the dollar and decreases in prices for commodities such as industrial metals.

. . . while core services price inflation remains elevated

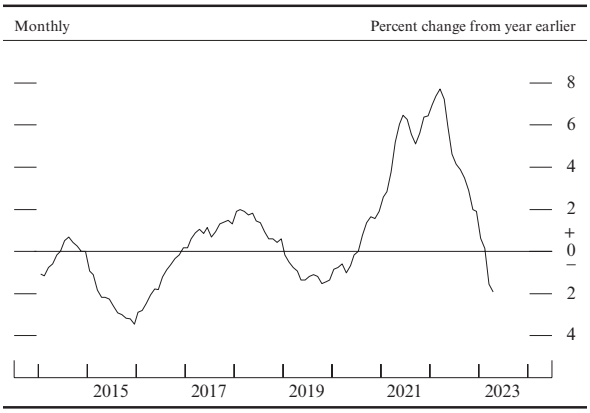
By contrast, core services price inflation remains elevated. Housing services prices have continued to rise especially rapidly, up 8.4 percent over the 12 months ending in April (figure 3). However, the monthly changes have started to ease in recent months, consistent with the moderate increases observed since last autumn in market rents on new housing leases to new tenants (figure 7). Because prices for housing services measure the rents paid by *all* tenants (and the equivalent rent implicitly paid by all homeowners)—including those whose leases have not yet come up for renewal—they tend to adjust slowly to changes in rental market conditions and should therefore be expected to continue to decelerate over the year ahead. By contrast, prices for other core services—a broad group that includes services such as travel and dining, financial services, and car repair—rose 4.6 percent over the 12 months ending in April and have not yet shown signs of slowing. However, the nascent softening of labor demand and improvements in labor supply, over time, should help slow core services price inflation as labor cost growth moderates.

5. Suppliers' delivery times



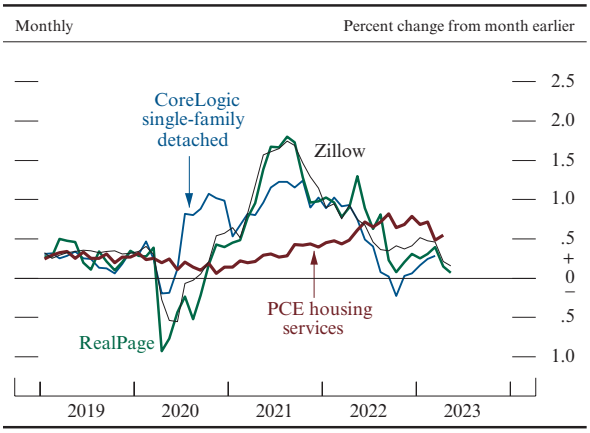
NOTE: Values greater than 50 indicate that more respondents reported longer delivery times relative to a month earlier than reported shorter delivery times.
SOURCE: Institute for Supply Management, *Report on Business,* via Haver Analytics.

6. Nonfuel import price index



NOTE: The data extend through April 2023.
SOURCE: Bureau of Labor Statistics via Haver Analytics.

7. Housing rents



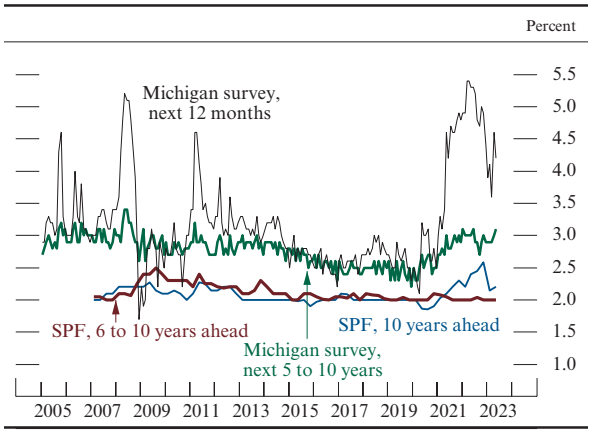
NOTE: CoreLogic data extend through March 2023, and personal consumption expenditures (PCE) data extend through April 2023. Zillow, CoreLogic, and RealPage measure market-rate rents–that is, rents for a new lease by a new tenant.
SOURCE: Bureau of Economic Analysis, PCE, via Haver Analytics; CoreLogic, Inc.; Zillow, Inc.; RealPage, Inc.; Federal Reserve Board staff calculations.

Measures of longer-term inflation expectations have been generally stable, while shorter-term expectations have been volatile and remained somewhat elevated

The generally held view among economists and policy analysts is that inflation expectations influence actual inflation by affecting wage- and price-setting decisions. Since the end of last year, movements in the survey-based measures of expected inflation over a longer horizon have been mixed, but they remained within the range of values seen during the decade before the pandemic and appear broadly consistent with the FOMC's longer-run 2 percent inflation objective. Expected inflation over the next 5 to 10 years, as measured in the University of Michigan Surveys of Consumers, has edged up from its average level in the fourth quarter of 2022 but was still within the range of values observed before the pandemic (figure 8). Expected inflation over the next 10 years in the Survey of Professional Forecasters, conducted by the Federal Reserve Bank of Philadelphia, has moved down since the end of last year, reflecting a decline in the expectations for inflation over the next few years. Over the five years beginning five years from now, the median forecaster in the survey continued to expect PCE price inflation to average 2 percent.

Furthermore, inflation expectations over a shorter horizon—which tend to more closely follow observed inflation—have moved down since the middle of last year. In the Michigan survey, the median value for inflation expectations over the next year was 4.2 percent in May, below the peak rate of 5.4 percent last spring but still quite elevated. Expected inflation for the next year, as measured in the Survey of Consumer Expectations, conducted by the Federal Reserve Bank of New York, has also declined, on net, over this period and has retraced more than half of its earlier increase.

8. Measures of inflation expectations



NOTE: The Survey of Professional Forecasters (SPF) data are quarterly, begin in 2007:Q1, and extend through 2023:Q2. The data for the Michigan survey are monthly.

SOURCE: University of Michigan Surveys of Consumers; Federal Reserve Bank of Philadelphia, SPF.

Market-based measures of longer-term inflation compensation, which are based on financial instruments linked to inflation, are also broadly in line with readings seen in the years before the pandemic and consistent with inflation returning to 2 percent. For example, the measure of inflation compensation over the next five years implied by Treasury Inflation-Protected Securities has declined slightly since the end of last year, while the measure of inflation compensation for the period 5 to 10 years ahead has increased slightly (figure 9).

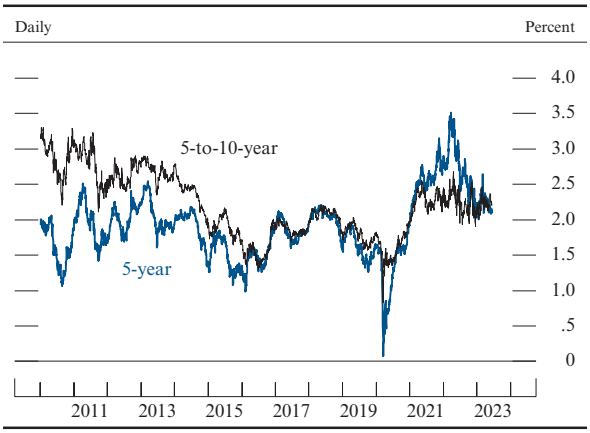
The labor market has continued to strengthen

Payroll employment gains averaged 314,000 per month during the first five months of this year, down from the 400,000 per month average pace last year but still quite robust (figure 10). Employment gains have been spread somewhat less evenly across industries this year than in 2022.[2] Employment in the leisure and hospitality and the health services sectors, as well as in state and local governments, continued to increase robustly over the first half of this year, while employment growth in construction, manufacturing, and retail trade—industries that are more sensitive to interest rate increases—has moderated. Employment gains from the Bureau of Labor Statistics' (BLS) household survey also have been robust, on average, since the end of last year, about in line with the payroll survey.

The unemployment rate has remained near historically low levels (figure 11). At 3.7 percent in May, the jobless rate was close to its level right before the pandemic and has been fluctuating within a narrow range since early last year. Unemployment rates among various age, educational attainment, gender, and ethnic and racial groups are also near their

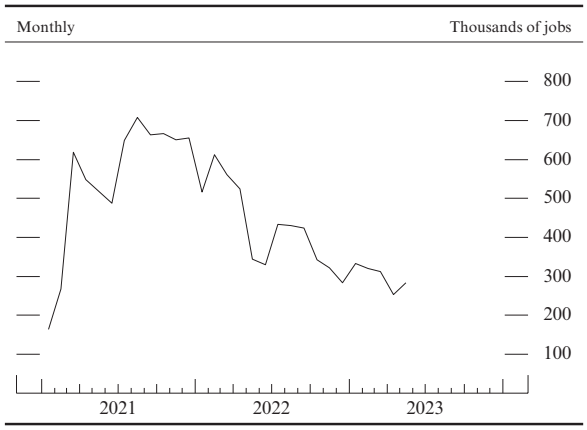
2. The share of industries expanding their employment each month, on average, was 60 percent during the first half of this year, down from 69 percent in 2022 and just slightly above the 57 percent average rate observed between 1991 and 2019.

9. Inflation compensation implied by Treasury Inflation-Protected Securities



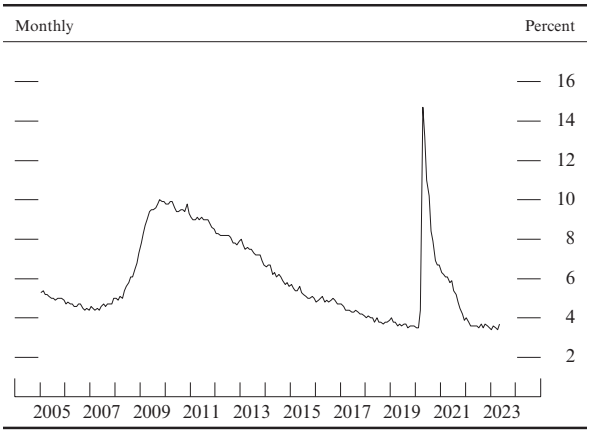
NOTE: The data are at a business-day frequency and are estimated from smoothed nominal and inflation-indexed Treasury yield curves.
SOURCE: Federal Reserve Bank of New York; Federal Reserve Board staff calculations.

10. Nonfarm payroll employment



NOTE: The data shown are a 3-month moving average of the change in nonfarm payroll employment.
SOURCE: Bureau of Labor Statistics via Haver Analytics.

11. Civilian unemployment rate



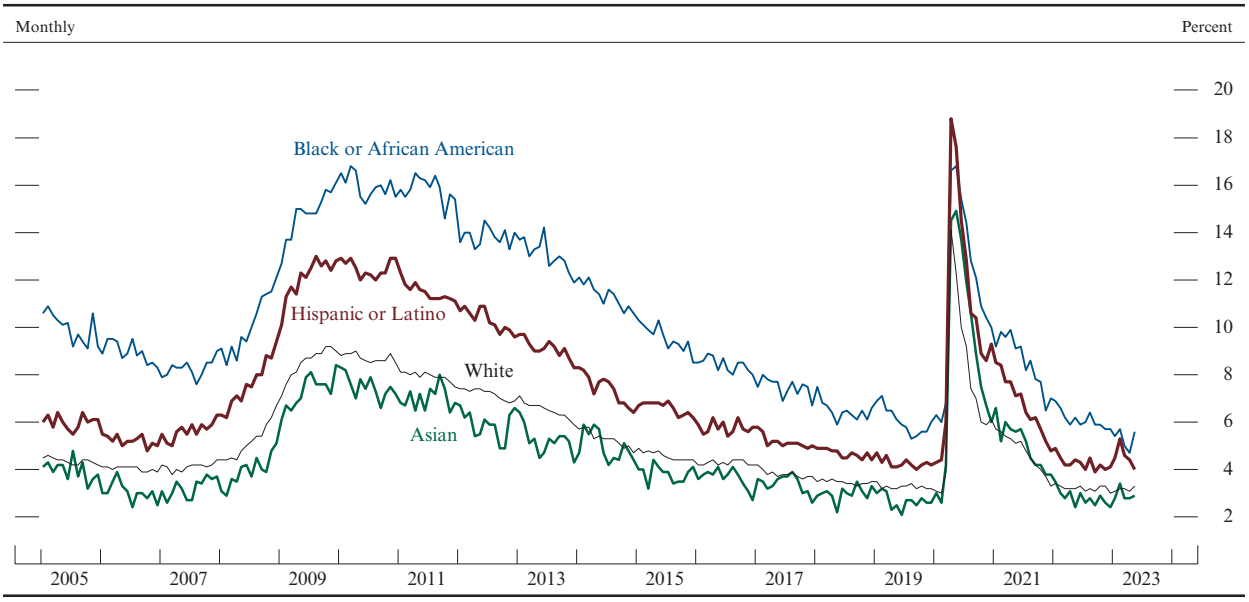
SOURCE: Bureau of Labor Statistics via Haver Analytics.

respective historical lows (figure 12). (The box "Developments in Employment and Earnings across Demographic Groups" provides further details.)

Labor demand has eased but remains very strong . . .

Demand for labor remained very strong in the first half of 2023. The Job Openings and Labor Turnover Survey indicated that there were around 10 million job openings at the end of April—down about 2 million from the all-time high recorded in March 2022 but still around 3 million above pre-pandemic levels. An alternative measure of job vacancies constructed by Federal Reserve Board staff using job postings data from the large online job board Indeed also shows that vacancies have continued to move gradually lower through the first half of 2023 but have remained well above pre-pandemic levels. Many employers report having scaled back their hiring plans somewhat, though levels of anticipated hiring remain high by historical

12. 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.

Developments in Employment and Earnings across Demographic Groups

Strong labor demand over the past two years, with plentiful job openings and low levels of layoffs, has pushed the unemployment rate down to its lowest level in 50 years. Just as previous economic expansions have tended to narrow long-standing differences in employment and wages across demographic groups, many of these gaps are now in historically narrow ranges as a result of today's very tight labor market. One notable exception is employment differences across age groups, as persistently elevated retirement rates since the onset of the COVID-19 pandemic have kept employment for older age groups (as a share of the population) below pre-pandemic levels.

Among prime-age workers, the tight labor market conditions of the past two years have reversed the pandemic-induced widening of the gaps in employment across racial, ethnic, and education groups. As shown in the left panel of figure A, Black or African American and Hispanic or Latino workers saw much larger employment declines in early 2020 than Asian and white workers. By mid-2022, however, employment in each of these groups had recovered to or surpassed its pre-pandemic level.[1] This year has seen further improvements, on net, for Black or African American workers: The prime-age Black employment-to-population (EPOP) ratio stands near a historical high, and the prime-age Black–white employment gap recently hit a series low (not shown).[2] Similarly, both men and women aged 25 to 54 with a high school degree or less saw much larger employment declines in early 2020 than prime-age workers with at least some college education, but by the end of 2022, these gaps had almost entirely returned to their 2019 levels, as shown in the right panel of figure A. For prime-age women as a whole, the employment rate has risen briskly in recent months and currently stands at a historical high, bolstered by a historically high participation rate.

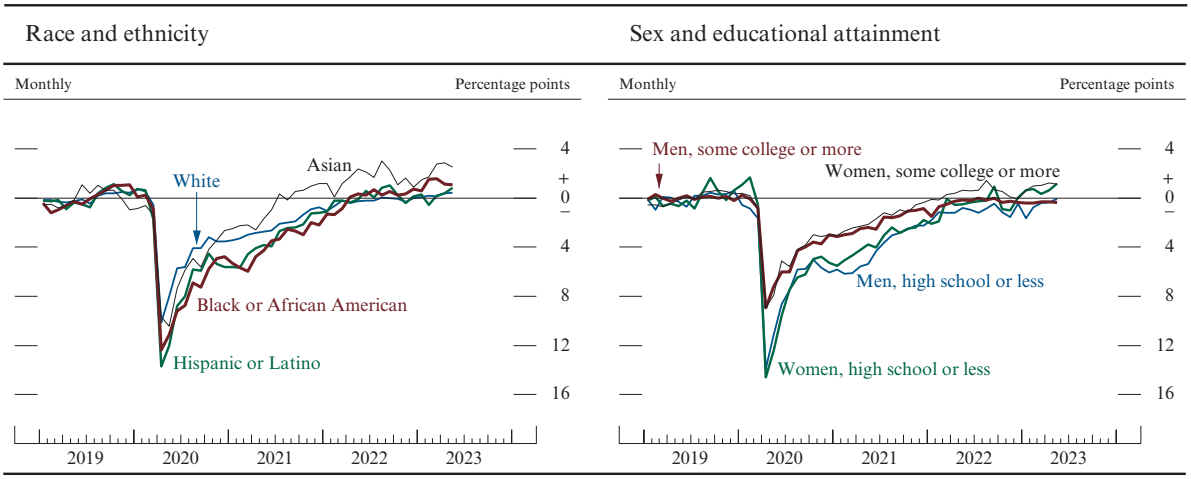
Differences in employment dynamics between groups since the start of the pandemic stem from a mixture of demand and supply factors. On the labor demand side, the leisure and hospitality sector experienced severe losses in 2020 but has seen a strong rebound in employment in the past two years.

(continued on next page)

1. This discussion defines the pre-pandemic baseline employment-to-population (EPOP) ratio for each group as that group's average EPOP ratio over 2019.

2. The recent rise in the prime-age Black EPOP ratio has been driven by both a rapid rise in the prime-age Black participation rate above its pre-pandemic level and a falling of the Black unemployment rate to a historical low.

A. Prime-age employment-to-population ratios compared with the 2019 average ratio, by group



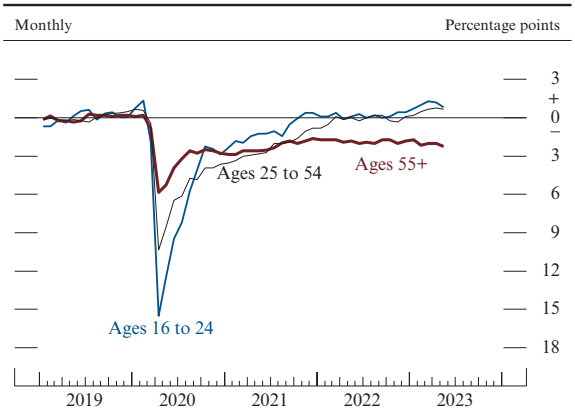
NOTE: Prime age is 25 to 54. All series are seasonally adjusted by the Federal Reserve Board staff.
SOURCE: Bureau of Labor Statistics; U.S. Census Bureau, Current Population Survey; Federal Reserve Board staff calculations.

Developments in Employment and Earnings *(continued)*

Because workers with a high school degree or less are historically more than twice as likely as workers with a college degree to be employed in leisure and hospitality, part of this group's unusually large employment decline and rebound is likely attributable to the fluctuations in labor demand from this sector.[3] Additionally, transportation and warehousing, the sector with the largest increase in labor demand during the pandemic, disproportionately employs Black workers and workers with a high school degree or less. As this sector has largely maintained its pandemic-era employment gains, these groups' employment rates have also benefited disproportionately. On the labor supply side, with schools having generally returned to in-person education for the past two years, childcare constraints have eased, allowing many parents, particularly mothers, to reenter the workforce. Furthermore, labor supply and demand factors may be combining to facilitate employment for historically marginalized workers. For instance, greater availability of telework, along with strong labor demand, is likely pulling more people with disabilities into employment—a group whose EPOP ratio has risen sharply over the past two years and stands roughly 3 percentage points above its pre-pandemic level.

While labor supply among prime-age workers appears to have largely normalized, differential effects of the pandemic on labor supply across age groups persist. Despite experiencing larger losses at the outset of the pandemic, workers aged 16 to 24 and 25 to 54 have now surpassed their pre-pandemic EPOP ratios (see figure B). The EPOP ratio for those aged 55 and over, however, has shown little net improvement since late 2021 and currently stands about 2 percentage points below its pre-pandemic level. The lower EPOP ratio for that group is entirely attributable to a lower labor force participation rate, which in turn largely reflects an increase in retirements since the onset of the pandemic.[4]

B. Employment-to-population ratios relative to 2019 average, by age



NOTE: Data are adjusted to account for the effect of the population control adjustments incorporated into the published data each January. See Federal Reserve Bank of Atlanta (2023), "Population Control Adjustment's Impact on Labor Force Data: The 2023 Edition," *Policy Hub: Macroblog,* February 9, https://www.atlantafed.org/blogs/macroblog/2023/02/09/population-control-adjustments-impact-on-labor-force-data--2023-edition.

SOURCE: Federal Reserve Bank of Atlanta; Bureau of Labor Statistics; U.S. Census Bureau, Current Population Survey; Federal Reserve Board staff calculations.

Although the pandemic-induced widening of employment gaps across racial, ethnic, and educational groups has reversed, considerable gaps remain. For example, while the prime-age EPOP ratio among Blacks recently reached an all-time high, it remains about 3.5 percentage points below that of whites, and the EPOP ratio of college-educated, prime-age people is about 13 percentage points higher than that of prime-age people with high school degrees or less.

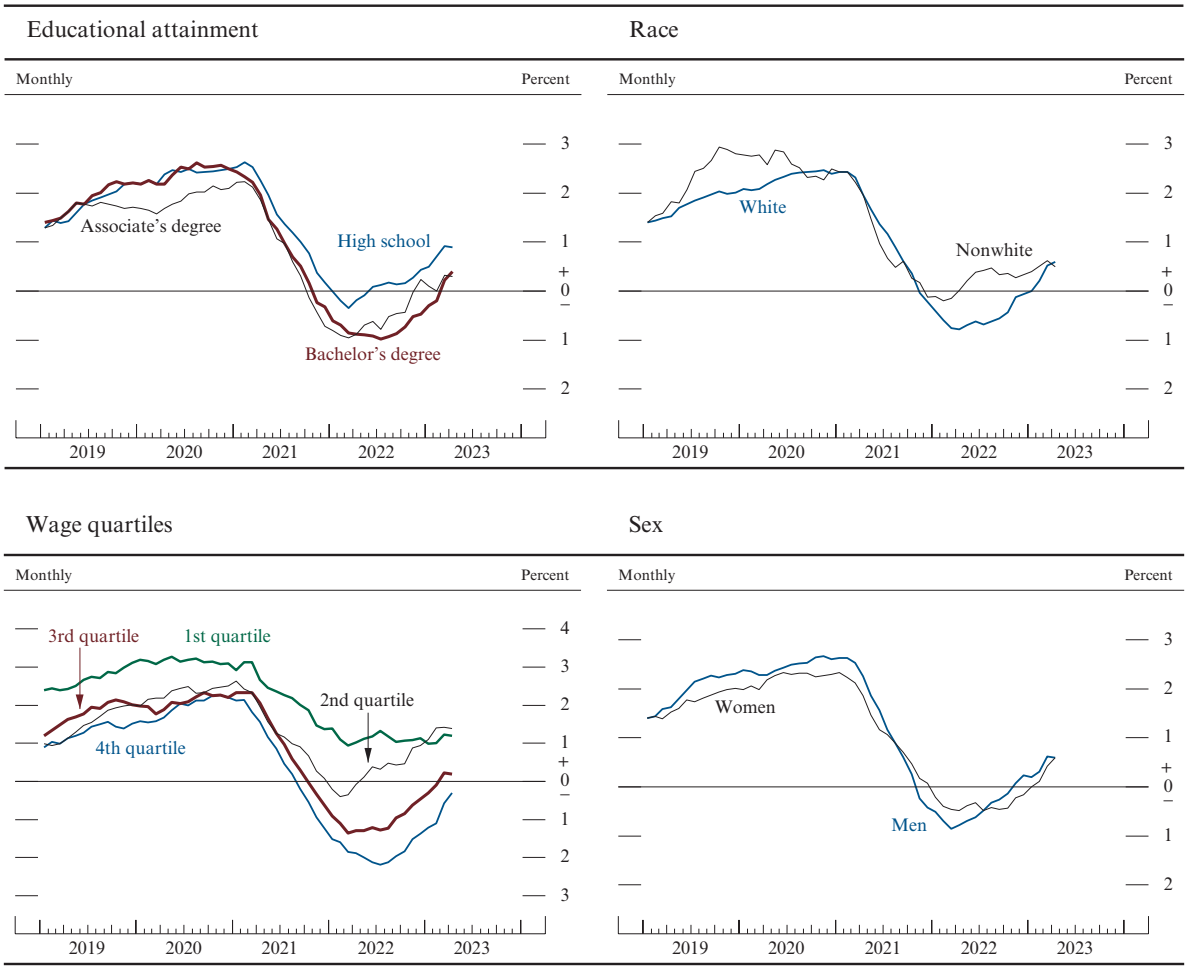
The tight labor market conditions of the past two years have led to strong growth in nominal wages. However, increases in the prices of goods and services over this period have outpaced the nominal wage gains experienced by many workers. As a result, many workers' real wages shrank in late 2021 and for much of 2022, and real wage growth has remained quite slow since then. The real wages of the least advantaged groups, however, have held up better during this period. As shown in the upper panels of figure C, real wages for workers with a high school degree or less

(continued)

3. Similarly, Black or African American, Hispanic or Latino, and Asian workers are also overrepresented in the leisure and hospitality industry relative to white workers, although these differences are smaller than differences by education. See Guido Matias Cortes and Eliza Forsythe (2023), "Heterogeneous Labor Market Impacts of the COVID-19 Pandemic," *ILR Review,* vol. 76 (January), pp. 30–55.

4. For an analysis on the increase in retirements following the pandemic, see Joshua Montes, Christopher Smith, and Juliana Dajon (2022), " 'The Great Retirement Boom': The Pandemic-Era Surge in Retirements and Implications for Future Labor Force Participation," Finance and Economics Discussion Series 2022-081 (Washington: Board of Governors of the Federal Reserve System, November), https://doi.org/10.17016/FEDS.2022.081.

C. Median real wage growth, by group



NOTE: The data extend through April 2023. Series show 12-month moving averages of the median percent change in the hourly wage of individuals observed 12 months apart, deflated by the 12-month moving average of the 12-month percent change in the personal consumption expenditures price index. In the bottom-left panel, workers are assigned to wage quartiles based on the average of their wage reports in both Current Population Survey outgoing rotation group interviews; workers in the lowest 25 percent of the average wage distribution are assigned to the 1st quartile, and those in the top 25 percent are assigned to the 4th quartile.

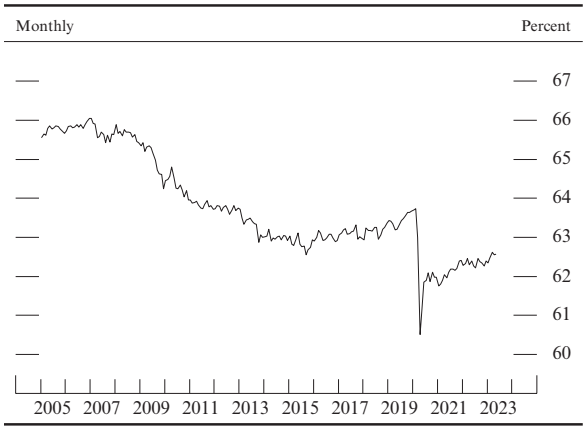
SOURCE: Federal Reserve Bank of Atlanta, Wage Growth Tracker; Bureau of Labor Statistics; U.S. Census Bureau, Current Population Survey.

and for nonwhite workers shrank less through early 2022 and have grown more since then.[5] This pattern largely reflects the fact that real wage growth has been consistently stronger at the lower end of the income distribution (see the lower-left panel).[6] There has been less of a difference in the real wage growth patterns of men versus women, which have largely moved in tandem over the past few years (see the lower-right panel).

5. In order to reduce noise due to sampling variation, which can be pronounced when considering disaggregated groups' wage changes, the series shown in figure C are the 12-month moving averages of the groups' median 12-month real wage change. Thus, by construction, these series lag the actual real wage changes.

6. The tightening of labor market conditions during the previous expansion also resulted in stronger real wage growth for workers in the bottom income quartile, reflecting the tendency of less advantaged workers to benefit disproportionately from tight labor market conditions.

13. Labor force participation rate



NOTE: The labor force participation rate is a percentage of the population aged 16 and over. Data from 2012–22 are adjusted for the January 2023 updated population controls. See Federal Reserve Bank of Atlanta (2023), "Population Control Adjustment's Impact on Labor Force Data: The 2023 Edition," *Policy Hub: Macroblog*, February 9, https://www.atlantafed.org/blogs/macroblog/2023/02/09/population-control-adjustments-impact-on-labor-force-data--2023-edition. Data before 2012 are adjusted for the January 2022 updated population controls. See Bureau of Labor Statistics (2022), "Adjustments to Household Survey Population Estimates in January 2022," Current Population Survey technical documentation (Washington: BLS, February), https://www.bls.gov/cps/population-control-adjustments-2022.pdf.

SOURCE: Bureau of Labor Statistics via Haver Analytics; Federal Reserve Bank of Atlanta; Federal Reserve Board staff calculations.

standards.[3] Initial claims for unemployment insurance moved up notably in the first two months of the year but appear to have flattened out more recently at a relatively low level.[4] Continued claims have been rising gradually, on net, since the turn of the year but have remained at a relatively low level as well.

. . . and labor supply has improved . . .

Meanwhile, the supply of labor continued to improve. The labor force participation rate, which measures the share of people either working or actively seeking work, moved up, on net, during the first five months of this year, though it is still roughly 1 percentage point below its February 2020 level (figure 13).[5] The decline in overall participation reflects both the unusually large increase in retirements among older workers during the pandemic as well as the normal effects of population aging. Labor force participation for prime-age workers has risen markedly this year and recently surpassed its pre-pandemic level, while the rate for teens has flattened out after having moved above its pre-pandemic level last year. Participation has increased for all racial groups over the past year. (For a discussion of employment rates across demographic groups, see the box "Developments in Employment and Earnings across Demographic Groups.")

3. For example, the (net) share of employers planning to increase payrolls in coming months, as reported by both the staffing firm ManpowerGroup and the National Federation of Independent Business, has moved down over the past year but remains elevated.

4. The data on initial claims have been affected this year by some instances of fraudulent claims, which have been removed from the estimates after they were uncovered. In addition, the large swings in the data during the pandemic have made it more challenging to seasonally adjust claims in recent years.

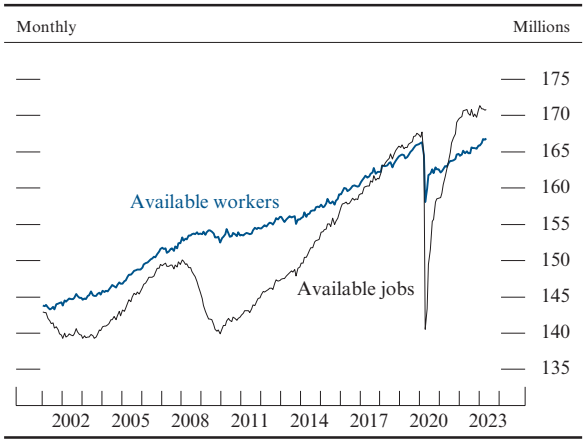
5. This labor force participation rate (LFPR) estimate and figure 13 adjust the historical data to account for the updated population estimates produced by the Census Bureau and incorporated by the BLS in its January 2022 Employment Situation report. Without making an adjustment for these updated population estimates, the LFPR would erroneously appear to have improved more since the onset of the pandemic and to be only about ¾ percentage point below its pre-pandemic level.

Labor supply has also been boosted over the past year by faster population growth, largely reflecting the rebound in immigration.[6] After having slowed to an average increase of 0.5 percent per year in 2020 and 2021 because of the COVID-related increase in mortality and restrictions on immigration, population growth bounced back in 2022 and is estimated to have been at an annual rate of 0.7 percent so far this year, about the same as the average growth rate in 2018 and 2019 but still well below the average growth rate observed between 1990 and 2015.

. . . but the labor market remains very tight

With the easing in labor demand and improvement in labor supply so far this year, the labor market has become somewhat less tight than it was last year, but it nonetheless remains very tight. The number of total available jobs (measured by total employment plus job openings) continues to far exceed the number of available workers (measured by the size of the labor force). This jobs–workers gap was around 4 million in May, below the peak of 6 million recorded in April 2022 but still very elevated by historical standards (figure 14).[7] Similarly, households' and small businesses' perceptions of labor market tightness have come down from their recent peaks but remain high. In addition, many employers surveyed for the Federal Reserve's May 2023 Beige Book reported some easing of hiring and retention difficulties but generally continued to report difficulty finding workers across a wide range of skill levels and industries.[8] Other measures suggest labor

14. Available jobs versus available workers



NOTE: Available jobs are employment plus job openings as of the end of the previous month. Available workers are the labor force. Data from 2012–22 are adjusted for the January 2023 updated population controls. See Federal Reserve Bank of Atlanta (2023), "Population Control Adjustment's Impact on Labor Force Data: The 2023 Edition," *Policy Hub: Macroblog*, February 9, https://www.atlantafed.org/blogs/macroblog/2023/02/09/population-control-adjustments-impact-on-labor-force-data--2023-edition. Data before 2012 are adjusted for the January 2022 updated population controls. See Bureau of Labor Statistics (2022), "Adjustments to Household Survey Population Estimates in January 2022," Current Population Survey technical documentation (Washington: BLS, February), https://www.bls.gov/cps/population-control-adjustments-2022.pdf.

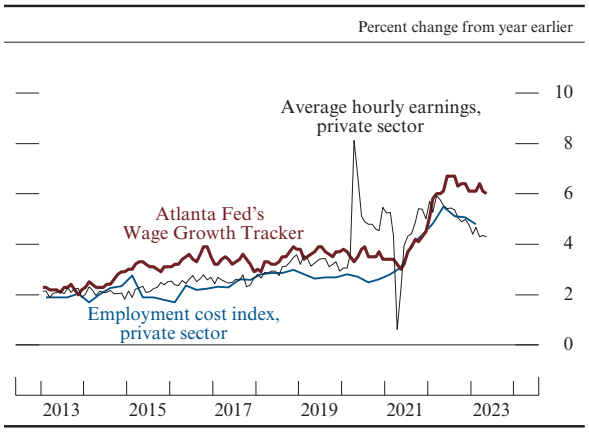
SOURCE: Bureau of Labor Statistics; Job Openings and Labor Turnover Survey; both via Haver Analytics; Federal Reserve Bank of Atlanta; Federal Reserve Board staff calculations.

6. The population estimate refers to the civilian noninstitutional population aged 16 and older. This population estimate adjusts the historical data to account for the updated population estimates produced by the Census Bureau and incorporated by the BLS in its January 2022 Employment Situation report.

7. The ratio of job openings to unemployment shows that there were 1.7 job openings per unemployed person in May 2023. For comparison, this ratio averaged 1.2 in 2019 and 0.6 over the 10-year period from 2010 to 2019.

8. See the May 2023 Beige Book, available on the Board's website at https://www.federalreserve.gov/monetarypolicy/files/BeigeBook_20230531.pdf.

15. Measures of change in hourly compensation



NOTE: 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; 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.

market tightness has eased more substantially over the past year. For example, the share of workers quitting jobs each month, an indicator of the availability of attractive job prospects, has continued to decline this year and has retraced nearly all of the increase between the start of the pandemic and its all-time peak in late 2021.

Wage growth has slowed but remains elevated

Nominal wage growth continued to show signs of slowing in the first part of 2023 but remained elevated (figure 15). Total hourly compensation as measured by the employment cost index increased 4.8 percent over the 12 months ending in March, a strong gain but a step-down from the peak increase of 5.5 percent observed early last year. Increases in average hourly earnings (a less comprehensive measure of compensation) have slowed as well, rising 4.3 percent over the 12 months to May, down from 5.5 percent over the preceding 12 months. Wage growth as measured by the Federal Reserve Bank of Atlanta's Wage Growth Tracker, which reports the median 12-month wage growth of individuals responding to the Current Population Survey, was 6.0 percent in May, below its peak last summer but well above the 3 to 4 percent pace reported over the few years before the pandemic. A similar measure constructed by Federal Reserve Board staff using data from the payroll processing firm ADP, which has a much larger sample than the Wage Growth Tracker, has shown a more noticeable decline since last summer.

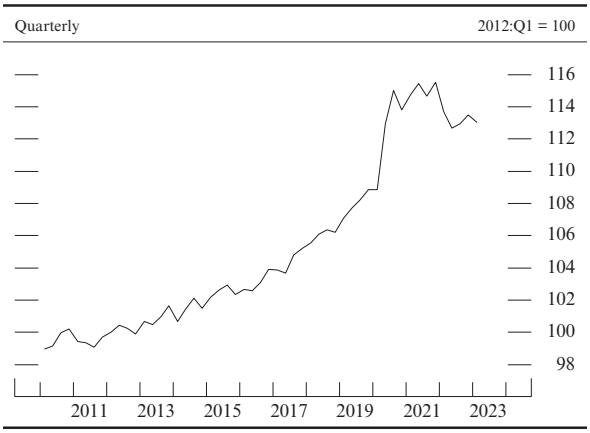
Following a period of strong growth, labor productivity weakened over the past year

The extent to which nominal wage gains raise firms' costs and act as a source of inflation pressure depends importantly on the pace of productivity growth. As measured by the BLS, productivity rose at a rapid average pace of 3 percent over 2020 and 2021, but it

declined last year and early this year as output growth in the nonfarm business sector fell short of growth in hours worked (figure 16). In retrospect, much of the strong productivity growth in 2020 and 2021 seems to have been the result of temporary pandemic-related factors, and thus the declines since then may reflect a normalization as productivity moves back toward its trend. In 2021, as the economy reopened, firms struggled to hire workers, and many firms temporarily operated with overstretched workforces.[9] Subsequently, the slowdown in aggregate demand growth over the past year allowed many firms to catch up in their hiring, and the level of productivity in the first quarter of this year was roughly back in line with its pre-pandemic trend.[10]

The pace of future productivity growth remains very uncertain. Productivity growth averaged only about 1 percent per year during the expansion that preceded the pandemic recession, and it is possible that the economy has remained in that low-productivity growth regime while experiencing large gyrations in aggregate demand and hiring induced by the pandemic. However, it also seems possible that the high rate of new business formation, widespread adoption of remote-work technology, and the wave of labor-saving investments that the pandemic brought about—as well as continued improvement in and adoption of artificial intelligence and robotics—could boost productivity growth above that pace in coming years.

16. U.S. labor productivity

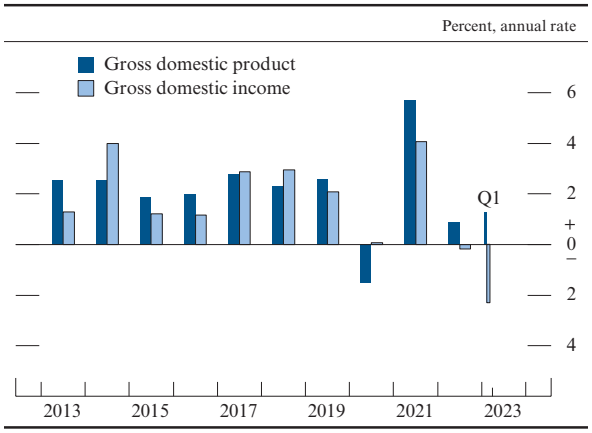


NOTE: The data are output per hour in the nonfarm business sector.
SOURCE: Bureau of Labor Statistics via Haver Analytics.

9. In 2020, significant composition effects were also boosting labor productivity, as pandemic-induced employment losses were largest in lower-productivity services sectors. Employment composition looks to have largely normalized by 2021.

10. Consistent with this view, the Beige Books published during the fall of last year reported that many employers cited concerns that their workforce was being overworked as an important reason for hiring; see the November 2022 Beige Book, available on the Board's website at https://www.federalreserve.gov/monetarypolicy/files/BeigeBook_20221130.pdf.

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



NOTE: The key identifies bars in order from left to right.
SOURCE: Bureau of Economic Analysis via Haver Analytics.

Momentum in gross domestic product has slowed

After the strong rebound in 2021 from the pandemic-induced recession, economic activity lost momentum last year, and growth in the first quarter of this year was modest as financial conditions continued to tighten. Real gross domestic product (GDP) rose at an annual rate of 1.3 percent in the first quarter, following an increase of less than 1.0 percent over the four quarters of 2022 (figure 17).[11] Among the components of GDP, growth in consumer spending picked up in the first quarter, reflecting unusually warm weather, a pickup in vehicle sales as the shortages eased, and a decline in energy prices that boosted households' purchasing power amid dour sentiment and tightening credit conditions. The sharp retrenchment in the housing sector that began last year in response to the rise in mortgage rates has moderated noticeably, while business investment growth has slowed. Finally, manufacturing output has been little changed, on net, so far this year, following a decline in the fourth quarter of last year, despite a rebound in motor vehicle production. Surveys of manufacturers point to continued weakness in coming months, as the diffusion indexes of new orders from various manufacturing surveys remained in contractionary territory, and backlogs of existing orders continued to decline.

Consumer spending growth has been resilient but appears to be moderating . . .

Consumer spending adjusted for inflation grew at a robust 3.8 percent rate in the first quarter, although the increase reflected a large gain in January that appears to have been partly attributable to temporary factors. For

11. Real gross domestic income (GDI) has been notably weaker than GDP over the past year, although both series measure the same economic concept, and any difference between the two figures reflects measurement error. GDI is reported to have declined at an annual rate of 2.3 percent in the first quarter of this year after having edged down 0.2 percent over the four quarters of 2022, in contrast to the increases in GDP and employment.

example, mild weather in some parts of the country boosted spending on services, and motor vehicle sales moved up sharply despite the tightening credit conditions, as a rebound in vehicle production alleviated some pent-up demand. All told, real consumer spending on goods has trended sideways since mid-2021 following its surge during 2020 and early 2021, while real spending on services has continued to grow but appears to be decelerating (figure 18). These data suggest that consumers' spending habits have been returning toward their pre-pandemic patterns, albeit very slowly.

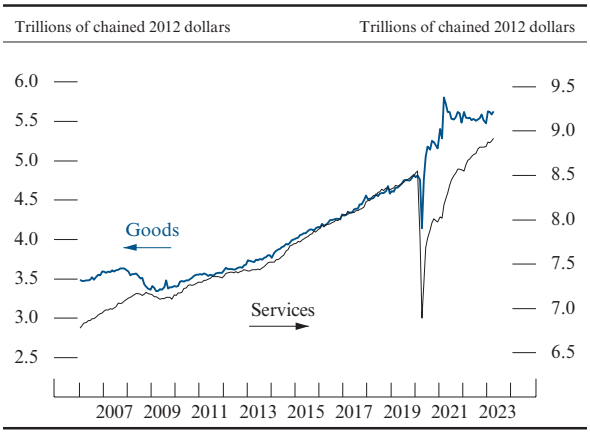
. . . as consumer confidence remains low and the saving rate edges up toward more typical levels

The fundamentals for household spending remain quite soft, despite some recent improvements, and appear to support only modest spending growth this year. The University of Michigan index of consumer sentiment remains very low by historical standards (figure 19). Although real disposable personal income (DPI) increased robustly in the first quarter, it has been roughly unchanged since the end of 2021 owing to the rise in prices, higher tax payments, and reduced transfers. Household wealth has declined since the end of 2021 and is providing less support to consumer spending, especially for households with low incomes that may have exhausted their excess savings accumulated earlier in the pandemic. The saving rate, which fell sharply in 2021 and the first half of 2022 as real DPI declined and excess savings were spent, began to increase in the second half of 2022 as real DPI started to rebound (figure 20). Households may be restraining consumer spending growth this year to continue raising the saving rate toward its pre-pandemic average level.

Consumer financing conditions have tightened

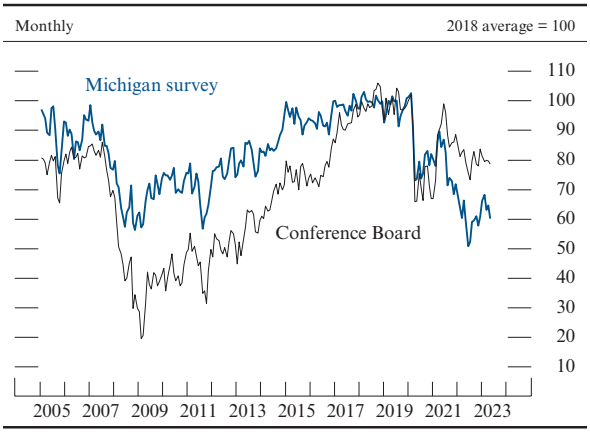
Consumer financing conditions have tightened in the wakes of the monetary policy tightening and the recent banking-sector developments.

18. Real personal consumption expenditures



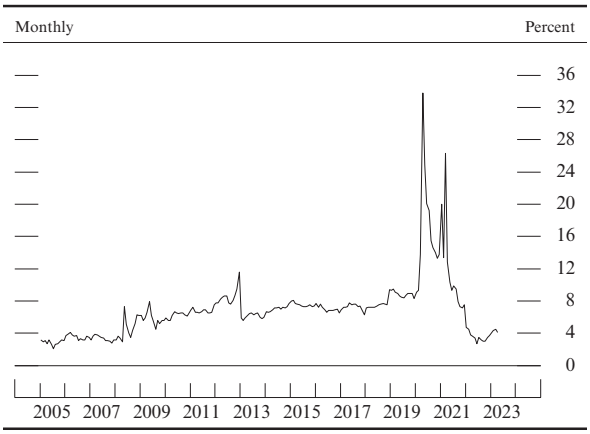
NOTE: The data are monthly and extend through April 2023.
SOURCE: Bureau of Economic Analysis via Haver Analytics.

19. Indexes of consumer sentiment



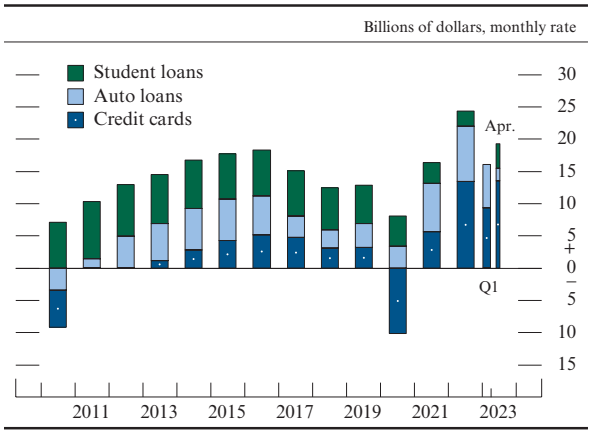
SOURCE: University of Michigan Surveys of Consumers; Conference Board.

20. Personal saving rate



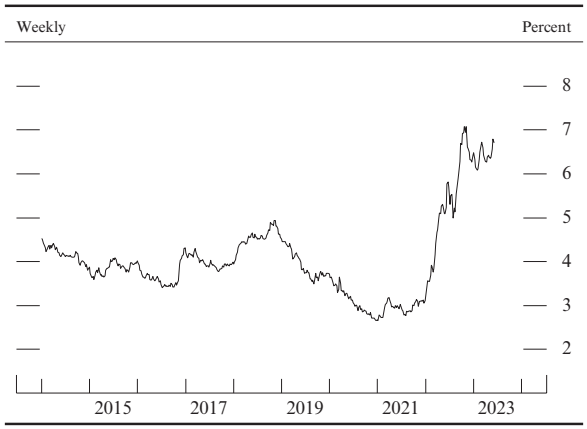
NOTE: The data extend through April 2023.
SOURCE: Bureau of Economic Analysis via Haver Analytics.

21. Consumer credit flows



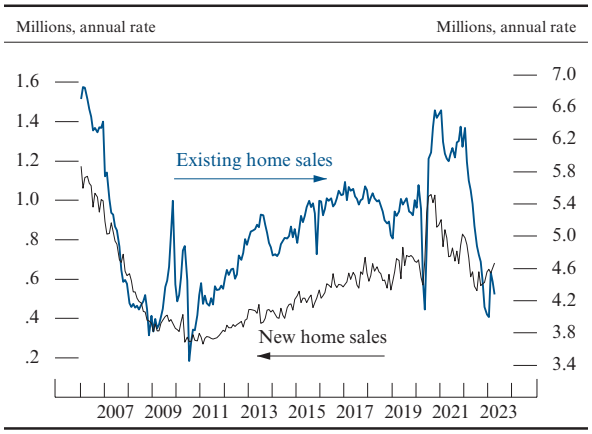
NOTE: The key identifies bars in order from top to bottom. Credit card balances were little changed in 2011 and 2012, and student loan balances were little changed in 2023:Q1.
SOURCE: Federal Reserve Board, Statistical Release G.19, "Consumer Credit."

22. Mortgage interest rates



NOTE: The data are contract rates on 30-year, fixed-rate conventional home mortgage commitments and extend through June 8, 2023.
SOURCE: Freddie Mac Primary Mortgage Market Survey.

23. New and existing home sales



NOTE: The data are monthly and extend through April 2023. New home sales include only single-family sales. Existing home sales include single-family, condo, and co-op sales.
SOURCE: For new home sales, U.S. Census Bureau; for existing home sales, National Association of Realtors; all via Haver Analytics.

Interest rates on credit cards and auto loans have increased over the past year and are now higher than the levels observed in 2018 at the peak of the previous monetary policy tightening cycle. In addition, banks reported tighter lending standards across consumer credit products in the second half of 2022 and early 2023, in part reflecting increases in delinquency rates, concerns about further future deterioration in credit performance, and higher funding costs in the banking sector. (See the box "Recent Developments in Bank Lending Conditions.")

After having risen last year, delinquency rates leveled off in the first quarter for auto loans and continued to increase for credit card loans. Among nonprime borrowers, the share of delinquent balances for auto loans and that for credit cards are above pre-pandemic levels, although these borrowers represent small shares of both markets. Despite the tighter financial conditions, consumer credit continued to expand during the past several months (figure 21). Total credit card balances across the credit score distribution have increased, and auto loans have continued to expand at a steady pace.

Housing market activity appears to have bottomed out

Following a steep decline in housing activity last year, many measures of activity appear to have bottomed out in recent months. Mortgage rates have been little changed, on net, so far this year after rising sharply last year (figure 22). With higher mortgage rates and the large home price increases having greatly reduced affordability and depressed homebuying sentiment, activity in the housing market has remained far below its recent peak so far this year.

Existing home sales have edged up this year, albeit from very low levels, as demand appears to have stabilized at a lower level consistent with the higher mortgage rates (figure 23). Meanwhile, the supply of existing homes for sale has remained quite low. New home

Recent Developments in Bank Lending Conditions

Bank lending conditions have tightened notably over the past year, and bank loan growth has slowed. Tighter credit standards and terms at banks are a normal part of the monetary policy tightening cycle, but the recent stress in the banking sector has reportedly led to additional tightening in credit conditions at some banks.[1]

Rising interest rates, in response to elevated inflation, and uncertainty about the economic outlook have increased borrowing costs and tightened bank credit conditions since the second quarter of 2022. In addition, deposit outflows have reduced an important source of funding for banks, as investors have shifted toward higher-yielding alternative investment vehicles, such as money market funds (MMFs). These outflows reflect banks raising their deposit rates relatively slowly in response to policy tightening, and the spreads between MMF yields and bank deposit rates widening sharply. Despite these outflows, bank deposits have remained elevated relative to the pre-pandemic levels, given the large increase in bank deposits experienced during the COVID-19 pandemic.[2]

Bank credit conditions have tightened further since March. As detailed in the box "Developments Related to Financial Stability," some parts of the banking system came under severe stress late in the week of March 6, which led to large deposit outflows and depressed bank stock prices. Policy interventions by the Federal Reserve and other agencies helped mitigate the strains in the banking system, and deposit outflows slowed considerably, but the episode reportedly left an imprint on bank lending conditions, especially for mid-sized and small banks.

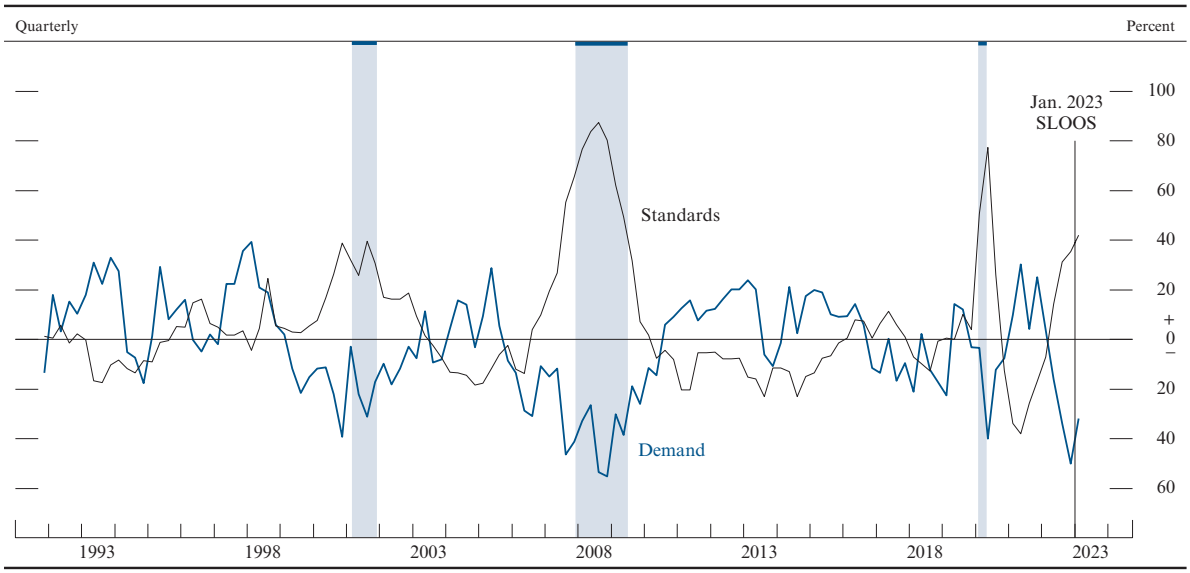
The Senior Loan Officer Opinion Survey on Bank Lending Practices (SLOOS) provides evidence on bank lending conditions. Figure A shows that banks reported having tightened lending standards across most loan

(continued on next page)

1. For evidence on the relationship between tighter monetary policy and credit conditions, see Ben Bernanke and Mark Gertler (1995), "Inside the Black Box: The Credit Channel of Monetary Policy Transmission," *Journal of Economic Perspectives*, vol. 9 (Fall), pp. 27–48.

2. For a discussion of bank deposit growth during the COVID-19 pandemic, see Andrew Castro, Michele Cavallo, and Rebecca Zarutskie (2022), "Understanding Bank Deposit Growth during the COVID-19 Pandemic," FEDS Notes (Washington: Board of Governors of the Federal Reserve System, June 3), https://doi.org/10.17016/2380-7172.3133.

A. Changes in standards and demand across loan categories for domestic respondents



NOTE: Series shows the net share of banks reporting tighter standards or stronger demand, aggregated across loan categories weighting by the size of banks' portfolios in the Call Report at the end of the previous quarter. For the black curve, positive (negative) values indicate banks reporting tighter (easier) standards; for the blue curve, positive (negative) values indicate banks reporting stronger (weaker) demand. The shaded bars with top caps indicate periods of business recession as defined by the National Bureau of Economic Research: March 2001 to November 2001, December 2007 to June 2009, and February 2020 to April 2020. Data for 2023:Q1 correspond to results for the April 2023 Senior Loan Officer Opinion Survey on Bank Lending Practices (SLOOS).

SOURCE: Federal Reserve Board (FRB), SLOOS; FRB staff calculations.

Recent Developments in Bank Lending Conditions *(continued)*

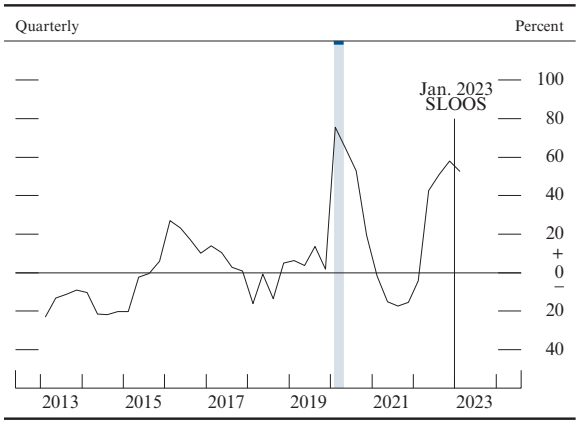
categories since the beginning of the policy tightening cycle and well before the emergence of banking-sector stresses in March. Banks reported additional tightening in the April 2023 SLOOS and indicated that they expect to further tighten their lending standards over the remainder of 2023. While banks continued to cite concerns over credit quality, collateral values, and the macroeconomic outlook as reasons for tightening or expecting to tighten their lending standards, some banks also reported concerns about their liquidity positions, deposit outflows, and funding costs as reasons for tightening their lending standards in the first quarter and expecting to tighten over the remainder of 2023. Current and expected tightening, and concerns about liquidity, deposits, and funding costs, were more frequently reported by the mid-sized and small banks relative to the largest banks. This evidence suggests that the recent banking-sector stress and related concerns about deposit outflows and funding costs contributed to tightening and expected tightening in lending standards and terms at some banks beyond what these banks would have reported absent the banking-sector stress.[3]

From a sectoral perspective, commercial real estate (CRE) loans have registered the most frequent reports of tightening in lending standards over the past year (figure B). Similarly, in the April survey, a large fraction of banks reported expecting further tightening in CRE lending, especially among mid-sized and small banks. In addition, banks reported tightening over a broad range of terms for CRE loans in the past year, with the most frequently reported changes pertaining to wider spreads of loan rates over banks' cost of funds and lower loan-to-value ratios. Consistent with the tightening in standards for CRE loans, in the recent earnings calls, banks attributed increased loan loss provisioning, in part, to concerns about the worsening outlook for CRE loan quality. In turn, while demand for loans was reported to have weakened for most loan categories in the April SLOOS, this finding was more widely reported for CRE loans. Banks have been reporting weaker demand for CRE loans since mid-2022.

Consistent with the tightening standards, as well as with the weakening loan demand, growth in core loans on banks' books has been decelerating since late 2022. Commercial and industrial (C&I) and CRE loan growth

(continued)

B. Changes in standards across commercial real estate loans for domestic respondents



NOTE: Series shows the net share of banks reporting tighter standards for commercial real estate loans. Individual bank responses have been weighted by the outstanding amount of the relevant loan category on its balance sheet at the end of the previous quarter based on Call Report data. Positive (negative) values indicate banks reporting tighter (easier) standards. The shaded bar with a top cap indicates a period of business recession as defined by the National Bureau of Economic Research: February 2020 to April 2020. Data for 2023:Q1 correspond to results for the April 2023 Senior Loan Officer Opinion Survey on Bank Lending Practices (SLOOS).

SOURCE: Federal Reserve Board (FRB), SLOOS; FRB staff calculations.

3. In the April SLOOS, the largest banks are defined as those with total domestic assets of $250 billion or more as of December 31, 2022, mid-sized banks as those with assets between $50 billion and $250 billion, and banks in the small, or other, category as those with assets under $50 billion. See Board of Governors of the Federal Reserve System (2023), Senior Loan Officer Opinion Survey on Bank Lending Practices (Washington: Board of Governors, April), https://www.federalreserve.gov/data/sloos/sloos-202304.htm.

at banks has slowed, and C&I loan balances have even declined in recent months. Growth of residential real estate and consumer loans has continued to be solid but has also decelerated.

Tighter credit conditions at banks can weigh on economic activity, but the extent of their effects is uncertain and may vary across borrowers. Economic research has shown that banks perform a key role in aggregating funding and developing relationships with borrowers, and thus disruptions in banks' ability to provide credit can negatively affect borrowers' economic well-being.[4] Several papers document the effects of bank credit tightening on aggregate economic activity.[5] Although different studies find effects that differ in magnitude and timing, a broad range of research highlights the potential for material adverse effects on economic activity from an acute tightening in bank credit availability. The economic research has also shown that the size of the effects varies by borrower type, geographic region, and economic sector.[6]

Bank-dependent sectors and communities, especially those that depend on small and mid-sized banks, are likely the most affected by the current tightening in bank credit conditions. The "Financial Accounts of the United States" show that the share of bank loans in aggregate outstanding credit to households and businesses has declined notably since the late 1970s, from more than one-half in those years to about one-third in recent years—a decline accompanied by the expansion of the market for corporate bonds and the growth in other sources of nonbank lending.

But many businesses and households still rely primarily on banks; for instance, while large businesses can access many nonbank sources of credit, small businesses mostly borrow from banks, often the small and mid-sized banks that service the geographic areas where these businesses are located. Therefore, tightening credit conditions can lead to reduced investment and employment at many small businesses. The CRE sector—which, as noted earlier, has seen a sharp tightening in standards, especially at mid-sized and small banks—also depends heavily on bank lending. Banks hold about 60 percent of total CRE mortgages, with smaller banks accounting for a notable share.[7] Finally, banks still hold the majority of credit card loans and a sizable portion of auto loans.

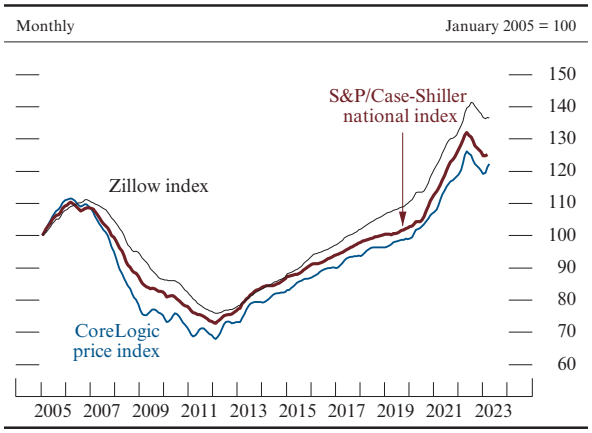
4. See, for instance, Ben S. Bernanke (1983), "Nonmonetary Effects of the Financial Crisis in the Propagation of the Great Depression," *American Economic Review*, vol. 73 (June), pp. 257–76; and Ben S. Bernanke (2018), "The Real Effects of Disrupted Credit: Evidence from the Global Financial Crisis," *Brookings Papers on Economic Activity*, Fall, pp. 251–322, https://www.brookings.edu/wp-content/uploads/2018/09/Bernanke_final-draft.pdf.

5. See, in particular, the SLOOS-based analysis by William F. Bassett, Mary Beth Chosak, John C. Driscoll, and Egon Zakrajšek (2014), "Changes in Bank Lending Standards and the Macroeconomy," *Journal of Monetary Economics*, vol. 62 (March), pp. 23–40. Other examples include Mark A. Carlson, Thomas King, and Kurt Lewis (2011), "Distress in the Financial Sector and Economic Activity," *B.E. Journal of Economic Analysis and Policy*, vol. 11 (1), pp. 1–31; and Ben Bernanke, Mark Gertler, and Simon Gilchrist (1996), "The Financial Accelerator and the Flight to Quality," *Review of Economic and Statistics*, vol. 78 (February), pp. 1–15.

6. Among others, see Diana Hancock and James A. Wilcox (1998), "The 'Credit Crunch' and the Availability of Credit to Small Business," *Journal of Banking and Finance*, vol. 22 (August), pp. 983–1014; Joe Peek and Eric S. Rosengren (2000), "Collateral Damage: Effects of the Japanese Bank Crisis on Real Activity in the United States," *American Economic Review*, vol. 90 (March), pp. 30–45; and Gabriel Chodorow-Reich (2014), "The Employment Effects of Credit Market Disruptions: Firm-Level Evidence from the 2008–9 Financial Crisis," *Quarterly Journal of Economics*, vol. 129 (February), pp. 1–59.

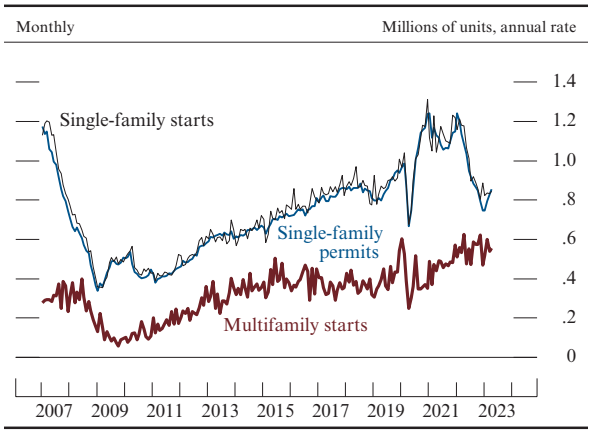
7. See the box "Financial Institutions' Exposure to Commercial Real Estate Debt" in Board of Governors of the Federal Reserve System (2023), *Financial Stability Report* (Washington: Board of Governors, May), pp. 16–17, https://www.federalreserve.gov/publications/files/financial-stability-report-20230508.pdf.

24. Real prices of existing single-family houses



NOTE: Series are deflated by the personal consumption expenditures price index. CoreLogic is not seasonally adjusted. The data for S&P/Case-Shiller extend through March 2023, and the data for Zillow and CoreLogic extend through April 2023.
SOURCE: Bureau of Economic Analysis via Haver Analytics; CoreLogic Home Price Index; Zillow, Inc., Real Estate Data; 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.)

25. Private housing starts and permits



NOTE: The data extend through April 2023.
SOURCE: U.S. Census Bureau via Haver Analytics.

sales have also moved up somewhat, allowing homebuilders to continue to reduce their inventories of unsold new homes. The rise in demand, together with tight supplies, has supported house prices, which now appear to be increasing again and are only slightly below their peak from the middle of 2022 (figure 24).

Despite the rebound in new home sales, single-family housing starts have remained low this year, as homebuilders continue to focus on completing homes already in the construction pipeline (figure 25). Single-family starts are well below their 2021 highs, though multifamily starts have held up, likely supported by a shift in demand toward rental units in response to the decline in purchase affordability.

Capital spending growth has slowed further

Business investment in equipment and intangible capital slowed in the first quarter after having expanded only modestly in the fourth quarter of last year, likely reflecting tighter financial conditions and weaker output growth overall (figure 26). In particular, investment in equipment declined in the fourth quarter of last year and the first quarter of this year, while investment in intangibles—including software as well as research and development—decelerated. By contrast, investment in nonresidential structures—which tends to respond with a lag to economic conditions—stepped up from its very low level. The strength has been concentrated in the manufacturing sector, while demand for categories such as office buildings has remained relatively weak.

Business financing conditions remained restrictive, but credit generally stayed available

Credit remained available to most nonfinancial corporations but at generally elevated interest rates and under tighter financial conditions more broadly. Banks tightened lending standards on commercial and industrial loans and commercial real estate loans over the first quarter, and business loan growth at banks continued to decelerate. Issuance of leveraged loans has been low thus far this year,

particularly following the recent stress in the banking system. By contrast, credit remained broadly available to large nonfinancial businesses through corporate bond markets; investment-grade corporate bond yields are little changed, on net, since the beginning of the year, and issuance of investment-grade bonds stayed solid outside of a temporary slowdown amid the onset of the banking-sector stresses. Issuance of speculative-grade bonds also picked up but remained subdued relative to pandemic-era levels. Credit quality has continued to be strong for most nonfinancial firms, though expectations of credit defaults in corporate bonds remain elevated, particularly for lower-rated firms.

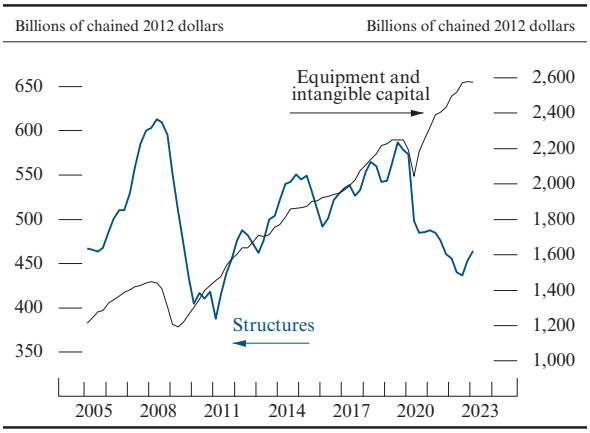
For small businesses, which are more reliant on bank financing than large businesses, credit also remained available but under tighter financing conditions. Surveys indicate that credit supply for small businesses has tightened this year, and interest rates on small business loans have risen notably.[12] Nevertheless, the volume of loan originations to small businesses has stayed within the range observed in the two years before the pandemic. Loan default and delinquency rates have risen notably over the past year and have returned to levels about in line with those observed before the pandemic.

Trade has picked up slightly

After declining in the second half of last year, real imports have increased only modestly this year, in line with the modest gains in domestic demand for goods (figure 27). Exports have rebounded more strongly, driven by a pickup in foreign growth but restrained by the past appreciation of the dollar. On balance, the reported change in net exports was neutral on GDP growth in the first quarter of this year

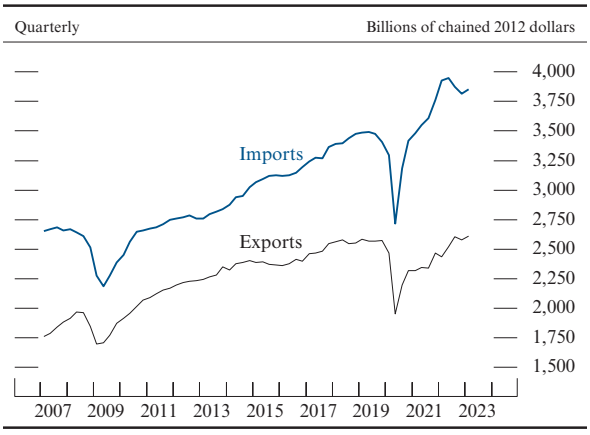
12. The National Federation of Independent Business's member poll indicates that the share of respondents reporting credit was more difficult to obtain than three months before has been rising since late 2021. Similarly, the Senior Loan Officer Opinion Survey on Bank Lending Practices released in April showed that banks have tightened lending standards on small business loans.

26. 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.

27. Real imports and exports of goods and services



SOURCE: Bureau of Economic Analysis via Haver Analytics.

after having contributed about 1½ percentage points to annualized GDP growth in the second half of last year.[13] The current account deficit as a share of GDP has been little changed since the second half of 2022 but remains wider than before the pandemic.

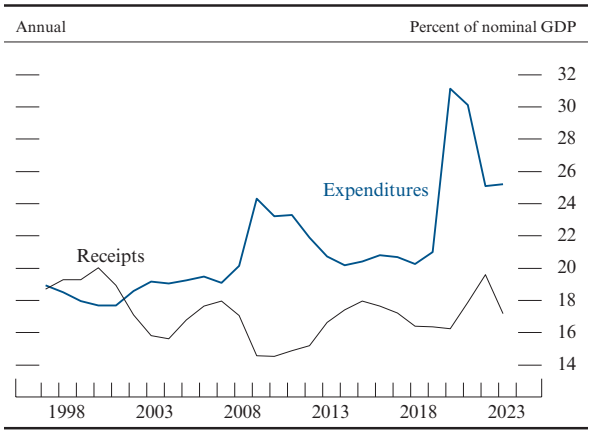
The support to economic activity from federal fiscal actions has been roughly neutral so far this year

The temporary policies the federal government enacted during the pandemic to alleviate hardship and support the economic recovery likely boosted GDP growth in 2020 and 2021 and then imparted a drag on GDP growth last year as the effects on spending waned. With the unwinding of the pandemic-related fiscal support having largely subsided by the end of last year, the contribution of discretionary changes in fiscal policy to GDP growth has been roughly neutral so far this year.

The budget deficit fell sharply from pandemic highs, causing growth in federal debt to moderate

Fiscal policies enacted since the start of the pandemic, combined with the effects of automatic stabilizers—the reduction in tax receipts and the increase in transfers that occur because of subdued economic activity—caused the federal deficit to surge to 15 percent of GDP in fiscal year 2020 and to more than 12 percent in fiscal 2021 (figure 28).[14] However,

28. Federal receipts and expenditures



NOTE: Through 2022, the receipts and expenditures data are on a unified-budget basis and are for fiscal years (October to September); gross domestic product (GDP) is for the 4 quarters ending in Q3. For 2023, receipts and expenditures are for the 12 months ending in May; GDP is the average of 2022:Q4 and 2023:Q1.

SOURCE: Department of the Treasury, Financial Management Service; Office of Management and Budget and Bureau of Economic Analysis via Haver Analytics.

13. Revised estimates of monthly imports and exports from the annual revision to the Census Bureau's trade data, which was published after the most recent GDP report, suggest net exports made a positive contribution to GDP growth in the first quarter.

14. For more information, see Congressional Budget Office (2020), "The Budgetary Effects of Laws Enacted in Response to the 2020 Coronavirus Pandemic, March and April 2020," June, https://www.cbo.gov/system/files/2020-06/56403-CBO-covid-legislation.pdf; Congressional Budget Office (2021), "The Budgetary Effects of Major Laws Enacted in Response to the 2020–2021 Coronavirus Pandemic, December 2020 and March 2021," September, https://www.cbo.gov/system/files/2021-09/57343-Pandemic.pdf; and Congressional Budget Office (2021), "Senate Amendment 2137 to H.R. 3684, the Infrastructure Investment and Jobs Act, as Proposed on

with pandemic-related fiscal support fading and receipts on the rise, the deficit fell to 5.5 percent of GDP in 2022.

As a result of the unprecedented fiscal support enacted early in the pandemic, federal debt held by the public jumped roughly 20 percentage points to 100 percent of GDP in fiscal 2020—the highest debt-to-GDP ratio since 1947 (figure 29). The debt-to-GDP ratio has moved down since fiscal 2020 owing to the rapid growth in nominal GDP. However, with interest rates on the rise, net interest outlays have recently picked up and are expected to continue to grow over the next few years.

State and local government budget positions remain strong . . .

Federal policymakers provided a historically high level of fiscal support to state and local governments during the pandemic, leaving the sector in a strong budget position overall. In addition, total state tax collections rose appreciably in 2021 and 2022, pushed up by the economic recovery (figure 30). In response to their strong budget positions, lawmakers cut state taxes by roughly $16 billion in state fiscal 2023, according to the National Association of State Budget Officers.

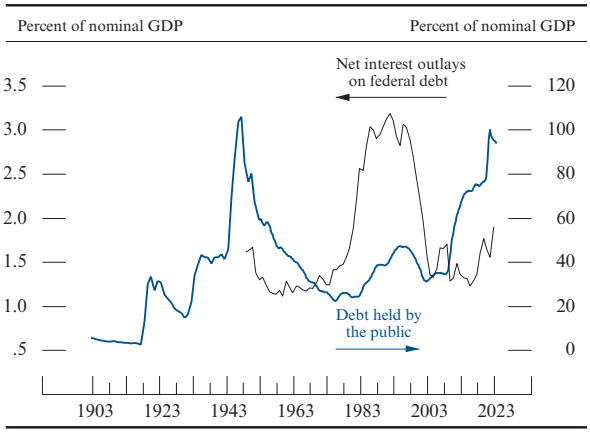
At the local level, property taxes have continued to rise, and the typically long lags between changes in the market value of real estate and changes in taxable assessments suggest that property tax revenues will continue to grow despite the recent sharp deceleration in house prices.

. . . and growth in employment has picked up while growth in construction outlays has been solid

Growth in state and local employment has continued to pick up in recent quarters while growth in construction outlays has stayed solid, with both measures now appearing to better reflect the strong budget positions

August 1, 2021," August 9, https://www.cbo.gov/system/files/2021-08/hr3684_infrastructure.pdf.

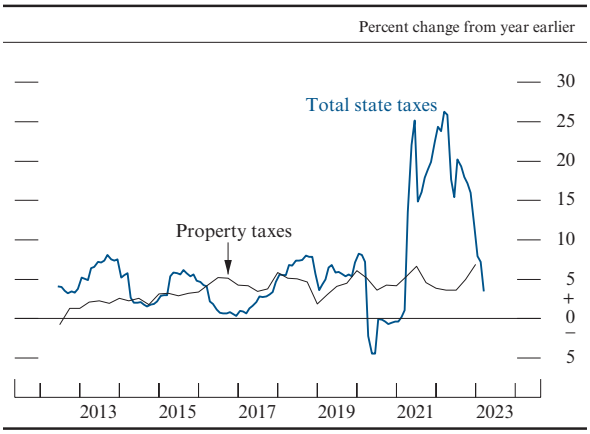
29. Federal government debt and net interest outlays



NOTE: The data for net interest outlays are annual, begin in 1948, and extend through 2022. Net interest outlays are the cost of servicing the debt held by the public. Federal debt held by the public equals federal debt less Treasury securities held in federal employee defined-benefit retirement accounts, evaluated at the end of the quarter. The data for federal debt are annual from 1901 to 1951 and a 4-quarter moving average thereafter. GDP is gross domestic product.

SOURCE: For GDP, Bureau of Economic Analysis via Haver Analytics; for federal debt, Congressional Budget Office and Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States."

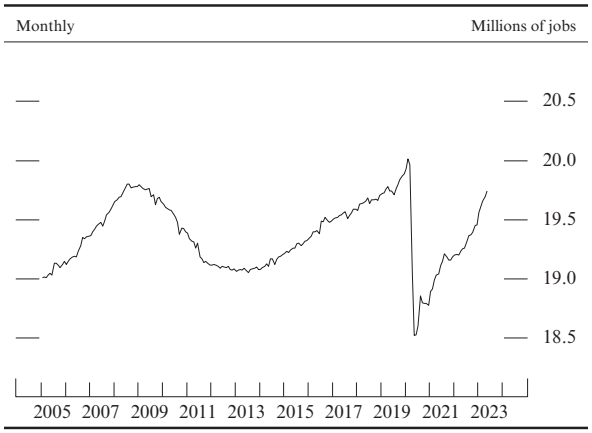
30. State and local tax receipts



NOTE: State tax data are year-over-year percent changes of 12-month moving averages, begin in June 2012, extend through March 2023, and are aggregated over all states except Wyoming, for which data are not available. Revenues from Washington, D.C., are also excluded. The data for January 2023 to March 2023 are missing for New Mexico, and the data for March 2023 are missing for Nevada, as these states have longer reporting lags than others. Property tax data are year-over-year percent changes of 4-quarter moving averages, begin in 2012:Q2, extend through 2022:Q4, and are primarily collected by local governments.

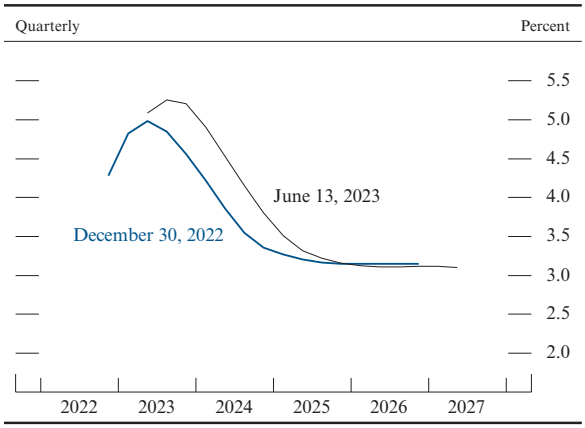
SOURCE: Monthly State Government Tax Revenue Data via Urban Institute; U.S. Census Bureau, Quarterly Summary of State and Local Government Tax Revenue.

31. State and local government payroll employment



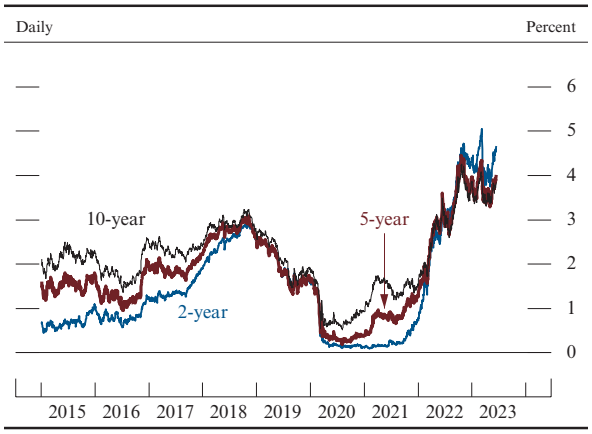
SOURCE: Bureau of Labor Statistics via Haver Analytics.

32. 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 December 30, 2022, is compared with that as of June 13, 2023. The path is estimated with a spline approach, assuming a term premium of 0 basis points. The December 30, 2022, path extends through 2026:Q4 and the June 13, 2023, path through 2027:Q2.
SOURCE: Bloomberg; Federal Reserve Board staff estimates.

33. Yields on nominal Treasury securities



SOURCE: Department of the Treasury via Haver Analytics.

of state and local governments (figure 31). Although both measures remain below their pre-pandemic levels, growth has improved notably as the headwinds from the big increase in retirements earlier in the pandemic and construction-sector bottlenecks have waned.

Financial Developments

The expected level of the federal funds rate over the next year shifted up

The FOMC raised the target range for the federal funds rate a further 75 basis points since January. Market-based measures of the path of the federal funds rate expected to prevail through the start of 2025 also rose over this period, while market-implied expectations for late 2025 and 2026 are little changed on net (figure 32).[15] The market-implied policy path declined significantly in March, reflecting investors' view that the emergence of strains in parts of the banking sector could result in a less restrictive path for the federal funds rate, but retraced much of the decline on stronger-than-expected economic data and signs of stabilization in the banking sector. According to these market-based measures, investors anticipate that the federal funds rate will decline gradually from slightly above current levels starting late this year and reach a trough of about 3.1 percent toward the end of 2025. Meanwhile, a measure based on the Blue Chip Financial Forecasts published in the beginning of June suggested that the expected policy rate path over 2023 had increased moderately since January, bringing it to a level about in line with market-implied expectations at the time of the survey.

Yields on longer-term U.S. nominal Treasury securities were little changed on net

Yields on longer-term nominal Treasury securities were little changed, on net, since the start of the year (figure 33). Meanwhile,

15. These measures are based on market prices for overnight index swaps for the effective federal funds rate and are not adjusted for term premiums.

short-term Treasury yields rose, reflecting expectations for a higher near-term path for the federal funds rate. Yields across maturities rose early in the year amid strong economic data and inflation readings, fell sharply on the onset of banking-sector strains in early March, and partially retraced since then.

Yields on other long-term debt fluctuated with Treasury yields

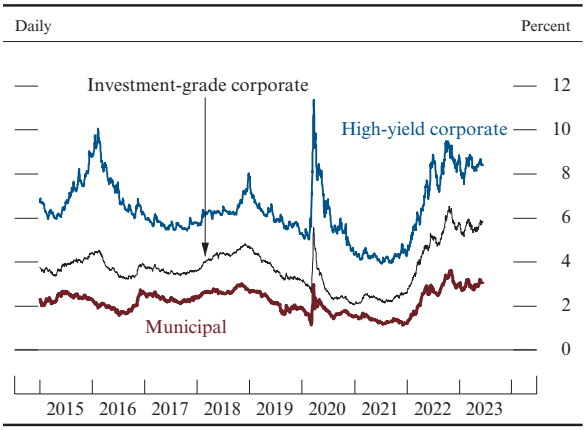
After increasing substantially last year, investment-grade corporate bond yields were little changed, on net, since January, while those for speculative-grade bonds declined moderately (figure 34). Spreads on corporate bonds to comparable-maturity Treasury securities decreased early in the year, reversed following the onset of the banking-sector strains, and then narrowed again. On net, spreads for investment-grade corporate bonds are little changed since the turn of the year, while those for speculative-grade bonds narrowed moderately, bringing both to levels slightly below their historical medians. Meanwhile, municipal bond spreads to comparable-maturity Treasury securities widened slightly since the beginning of the year. Spreads on investment-grade municipal bonds are now elevated by historical standards, while spreads on speculative-grade municipal bonds remain fairly low relative to their historical distribution. Overall, corporate and municipal credit quality remained strong, with defaults staying very low in both markets.

Yields on agency mortgage-backed securities (MBS)—an important pricing factor for home mortgage rates—rose further since January (figure 35). The MBS spread remained elevated relative to pre-pandemic levels, at least partly due to high interest rate volatility, which reduces the value of holding MBS.

Broad equity price indexes increased moderately

Since the beginning of the year, the S&P 500 index increased moderately on net (figure 36). The S&P 500 index declined in March,

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

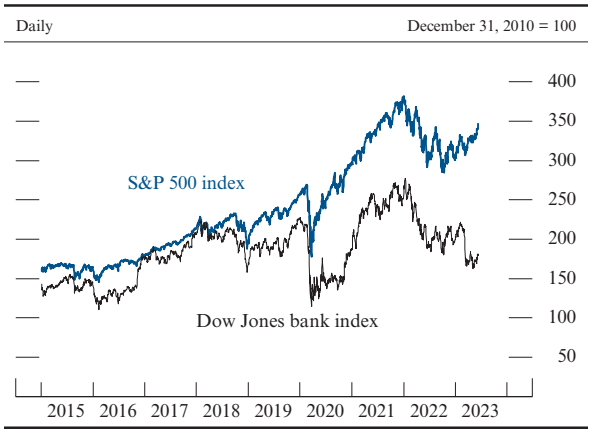


NOTE: Investment-grade corporate reflects the effective yield of the ICE Bank of America Merrill Lynch (BofAML) triple-B U.S. Corporate Index (C0A4). High-yield corporate reflects the effective yield of the ICE BofAML High Yield Index (H0A0). Municipal reflects the yield to worst of the ICE BofAML U.S. Municipal Securities Index (U0A0).
SOURCE: ICE Data Indices, LLC, used with permission.

35. Yield and spread on agency mortgage-backed securities

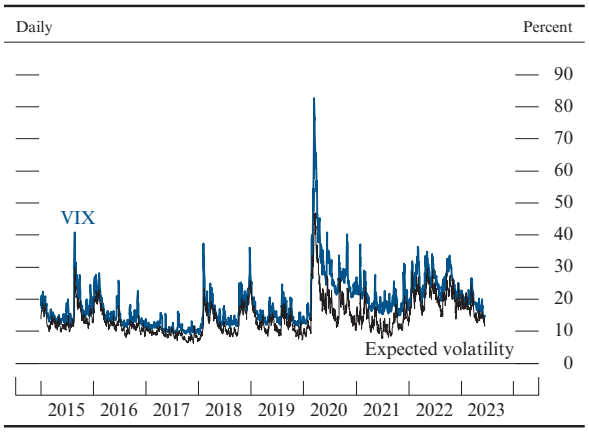
NOTE: The data are daily. Yield shown is for the uniform mortgage-backed securities 30-year current coupon, the coupon rate at which new mortgage-backed securities would be priced at par, or face, value for dates after May 31, 2019; for earlier dates, the yield shown is for the Fannie Mae 30-year current coupon. Spread shown is to the average of the 5-year and 10-year nominal Treasury yields.
SOURCE: Department of the Treasury; J.P. Morgan. Courtesy of J.P. Morgan Chase & Co., Copyright 2023.

36. Equity prices



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

37. S&P 500 volatility



NOTE: The VIX is an option-implied volatility measure that represents the expected annualized variability of the S&P 500 index over the following 30 days. The expected volatility series shows a forecast of 1-month realized volatility, using a heterogeneous autoregressive model based on 5-minute S&P 500 returns.

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

following the onset of banking concerns, but quickly made a full recovery and continued to rise. Meanwhile, equity prices for small-cap firms are little changed, on net, since early March and are modestly higher over the year to date. Equity prices of financial firms and banks plummeted as the banking sector came under stress and remained depressed relative to the beginning of the year. One-month option-implied volatility on the S&P 500 index—the VIX—spiked in early March but quickly retraced and ended the period moderately lower. The VIX is now near its lowest point since before the pandemic (figure 37). (For a discussion of financial stability issues, see the box "Developments Related to Financial Stability.")

Major asset markets functioned in an orderly way, but liquidity has remained low

Treasury market liquidity remained low by historical standards, consistent with ongoing economic uncertainty and high interest rate volatility. Liquidity conditions deteriorated notably in March, but they subsequently recovered and are little changed, on net, since the beginning of the year. Market depth—a measure of the availability of contracts to trade at best quoted prices—for Treasury securities remains near historically low levels, particularly for short-term Treasury securities. However, market functioning has continued to be orderly. Regarding equity market liquidity, market depth based on the S&P 500 futures improved modestly since January but remained somewhat low compared with pre-COVID levels. Corporate and municipal secondary bond markets continued to function well; transaction costs in these markets were fairly low by historical standards.

In the market for Treasury bills, yields on Treasury bills maturing in early June moved up sharply in May on mounting concerns about the debt ceiling. Those increases were reversed as the debt ceiling situation was resolved. Market participants have focused lately on the

Developments Related to Financial Stability

This discussion reviews vulnerabilities in the U.S. financial system. The framework used by the Federal Reserve Board for assessing the resilience of the U.S. financial system focuses on financial vulnerabilities in four broad areas: asset valuations, business and household debt, leverage in the financial sector, and funding risks. Since the previous *Monetary Policy Report*, three sizable domestic banks failed following substantial deposit outflows prompted by concerns over poor management of interest rate risk and liquidity risk. As stress in the banking sector materialized in March 2023, financial market volatility increased, and there were sharp declines in the equity prices of some banks that experienced sizable outflows of uninsured deposits. In order to prevent broader spillovers in the banking system, the Federal Reserve, together with the Federal Deposit Insurance Corporation and the Department of the Treasury, took decisive actions to protect bank depositors and support the continued flow of credit to households and businesses.[1] Following these actions, financial markets normalized, outflows of bank deposits slowed, and the banking system as a whole remains sound and resilient. However, ongoing stresses in the banking sector may weigh on credit conditions in the period ahead and increase uncertainty about the economic outlook.

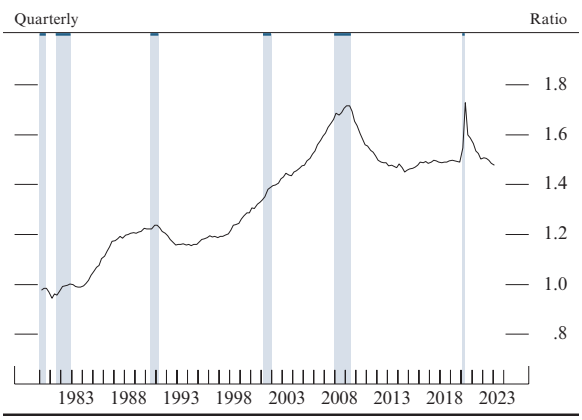
Despite notable volatility in financial markets, vulnerabilities stemming from asset valuations were about in line with history. Corporate bond spreads, measured as the difference in yields between corporate bonds and comparable-maturity Treasury securities, stayed near moderate levels. Valuation pressures in leveraged loan markets were little changed from the March report and remained in line with historical averages. Equity price growth outpaced growth in earnings forecasts since the previous report, pushing the forward price-to-earnings ratio a touch higher to a level well above its historical median. Despite weakening conditions in the commercial sector in recent months, valuations continued to be stretched in commercial as well as residential real estate properties.

With regard to vulnerabilities associated with household and business debt, the growth of nominal gross domestic product outpaced the growth of total debt of nonfinancial businesses and households; as a result, the ratio of private nonfinancial-sector debt to GDP fell further toward its pre-pandemic level (figure A). Although there are signs that business debt growth has slowed in recent months, measures of nonfinancial business leverage remained elevated relative to their historical levels. Nevertheless, large businesses maintain their ability to service debt, supported by robust earnings and a sizable share of liabilities that are relatively insensitive to changes in interest rates. The financial position of households generally remains strong. Household debt grew slower than GDP, and most of the growth was concentrated among prime-rated borrowers. Households' required debt payments relative to their disposable income increased slightly, but their debt service ratios remain at modest levels. Moreover, even in the event of higher interest rates, the extent to which households might face increasing mortgage interest expenses appears limited, as most mortgages originated in recent years were fixed rate. Nonetheless, some households remained financially stretched and more vulnerable to future shocks.

The price of U.S. bank shares came under substantial pressure following the runs by depositors

(continued on next page)

A. Private nonfinancial-sector credit-to-GDP ratio



NOTE: The shaded bars with top caps indicate periods of business recession as defined by the National Bureau of Economic Research: January 1980 to July 1980, July 1981 to November 1982, July 1990 to March 1991, March 2001 to November 2001, December 2007 to June 2009, and February 2020 to April 2020. GDP is gross domestic product.

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

1. For more details, see the boxes "The Bank Stresses since March 2023" and "The Federal Reserve's Actions to Protect Bank Depositors and Support the Flow of Credit to Households and Businesses" in Board of Governors of the Federal Reserve System (2023), *Financial Stability Report* (Washington: Board of Governors, May), pp. 34–36 and pp. 53–54, respectively, https://www.federalreserve.gov/publications/financial-stability-report.htm.

Developments Related to Financial Stability *(continued)*

on Silicon Valley Bank (SVB), Signature Bank, and First Republic Bank.[2] In international markets, Credit Suisse came under renewed pressure and agreed to a merger with UBS. Despite the official sector's intervention to support the banking system, broad bank equity prices fell sharply, with the largest declines concentrated among a set of banks characterized by balance sheet weaknesses similar to those of the failed banks—with a high concentration of uninsured deposits and large fair value losses on fixed-rate assets. The Federal Reserve will continue to monitor conditions closely and is prepared to use all its tools to support the safety and soundness of the U.S. banking system.

Despite these stresses, the broader banking system remains sound and resilient, as most banks are well capitalized and hold ample liquidity. Risk-based capital ratios increased at global systemically important banks (G-SIBs) to meet higher capital requirements stemming from an increase in their 2023 G-SIB surcharges. At other banks, these ratios decreased but nevertheless remained above regulatory requirements. Capital ratios that do not account for the riskiness of assets but do include fair value losses on available-for-sale securities in common equity edged up in the first quarter of 2023 after having declined throughout last year, especially at non–G-SIBs. Regarding liquidity, the amount of high-quality liquid assets decreased across all banks but remained high by historical standards. Banks' overall reliance on short-term wholesale funding continued to be low by historical standards. However, uninsured transactions and savings deposits remained well above pre-pandemic levels despite significant declines over the past year. SVB and Signature Bank were unusual in their heavy reliance on uninsured deposits, and most banks maintained a much more balanced mix of liabilities.

In the nonbank financial sector, broker-dealer leverage has stayed near recent historically low levels. During the volatile period following the bank failures, dealers faced elevated client flows and continued to intermediate in the Treasury securities markets and support market functioning. However, long-standing concerns remained about their ability or willingness to intermediate in fixed-income markets during stress. Leverage at hedge funds remained somewhat elevated, especially at the largest funds, though the most comprehensive data for hedge funds are considerably lagged. Amid increased volatility in Treasury yields following the SVB failure, hedge funds faced large margin calls on previously built interest rate bets and unwound positions, potentially contributing to further volatility.

Structural funding vulnerabilities persist at some nonbanks. As short-term interest rates rose over the past year, assets at prime money market funds (MMFs) increased. Following the failures of SVB and Signature Bank, prime funds experienced a jump in redemptions as prime money fund and other investors reallocated toward government money funds. Although outflows from prime MMFs eased after a few days, the episode illustrated again that these funds are at risk of large redemptions during episodes of financial stress. Assets under management at open-ended bond and bank loan mutual funds declined in the second half of 2022, and measures of exposure of these funds to redemption risks remained at historically high levels. Life insurers continued to have elevated liquidity risks, as risky and illiquid assets remained a high fraction of their total assets and short-term liabilities were also elevated.

A routine survey of market contacts on salient shocks to financial stability highlights several important risks. Some survey respondents indicated that higher interest rates could test the ability of some governments, households, and businesses to service their debt, including in emerging market economies that are exposed to global financial conditions. Ongoing stresses in the banking sector could cause a contraction in the supply of credit to households and businesses, resulting in a marked slowdown in economic activity and an increase in credit losses for some financial institutions. An escalation of Russia's war against Ukraine or a worsening in other geopolitical risks could lead to a resurgence in commodity prices, with adverse spillovers to global asset markets and economic activity, further affecting macroeconomic and financial conditions in the U.S.

2. On April 28, 2023, the Federal Reserve published a report examining the factors that contributed to the failure of SVB and the role of the Federal Reserve, which was the primary federal supervisor for the bank and its holding company, Silicon Valley Bank Financial Group. See Board of Governors of the Federal Reserve System (2023), *Review of the Federal Reserve's Supervision and Regulation of Silicon Valley Bank* (Washington: Board of Governors, April), https://www.federalreserve.gov/publications/files/svb-review-20230428.pdf. That same day, the Federal Deposit Insurance Corporation (FDIC) published a report examining the failure of Signature Bank, whose primary federal supervisor was the FDIC; see Federal Deposit Insurance Corporation (2023), *FDIC's Supervision of Signature Bank* (Washington: FDIC, April), https://www.fdic.gov/news/press-releases/2023/pr23033a.pdf.

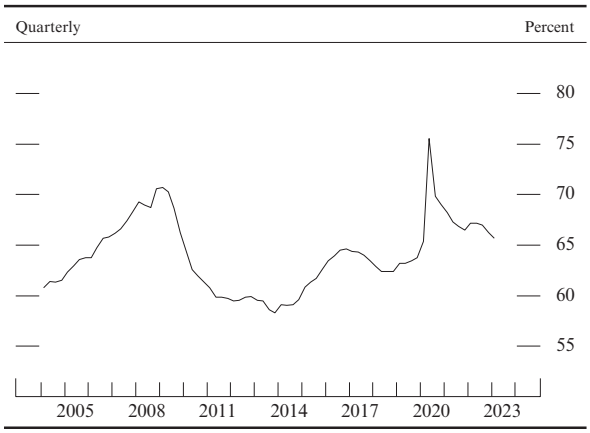
prospect for substantial Treasury bill issuance as the Treasury rebuilds the Treasury General Account.

Short-term funding market conditions remained stable

Conditions in overnight bank funding and repurchase agreement, or repo, markets remained stable. Increases in the FOMC's target range for the federal funds rate fully passed through to other overnight rates. The effective federal funds rate and other unsecured overnight rates have remained several basis points below the interest rate on reserve balances since January. The Secured Overnight Financing Rate has been at or slightly above the offering rate on the overnight reverse repurchase agreement (ON RRP) facility. There were, however, temporary dislocations in other short-term funding markets; spreads on term negotiable certificates of deposit and lower-rated nonfinancial commercial paper spiked in March but then normalized as conditions in the banking sector improved.

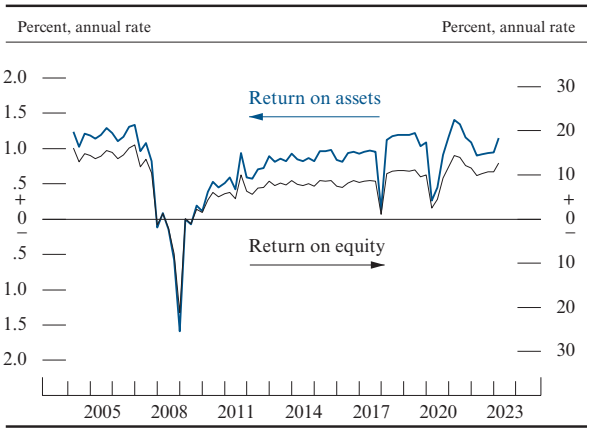
Government money market funds (MMFs) have seen a notable increase in assets under management (AUM) since January, driven in large part by the outflow of deposits from the banking sector. Prime funds, which have seen steady inflows over the tightening cycle, experienced mild outflows in the aftermath of the banking turmoil but have since recouped those flows and continued to grow. Weighted average maturities at prime and government MMFs remain near historical lows, likely in response to the continued increase in short-term rates and fund managers' uncertainty about the future path of interest rates. Elevated AUM, high demand for short-maturity assets at MMFs, and a limited supply of Treasury bills have all contributed to continuing elevated take-up at the Federal Reserve's ON RRP facility.

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



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

39. Profitability of bank holding companies



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

Bank credit continued to expand but at a slower pace

Growth in banks' total loan holdings slowed to about a 5 percent annualized rate in the first quarter of the year, down from a 9 percent rate in the fourth quarter of 2022, reflecting the effects of higher interest rates, tighter credit availability, and economic uncertainty. Bank credit as a share of nominal GDP continued to fall in the first quarter, but it remained elevated relative to pre-pandemic levels (figure 38). Banks reported tighter standards and weaker demand for most loan categories over the first quarter of 2023 in the April Senior Loan Officer Opinion Survey on Bank Lending Practices, continuing trends for standards and demand that have been reported since the middle of last year. Interest rates on bank loans continued to increase in the first quarter, reflecting higher short-term rates. Meanwhile, delinquency rates on bank loans remained near historical lows overall, despite increasing for consumer and real estate–backed loans. Bank profitability remained robust over the first quarter of 2023, though net interest margins edged down because of higher funding costs (figure 39). However, bank equity prices declined substantially since January, driven by declines following the emergence of strains in parts of the banking sector in March (figure 36). (For a discussion of bank credit availability, see the box "Recent Developments in Bank Lending Conditions.")

International Developments

Economic activity rebounded at the start of the year

Following a slowdown at the end of 2022, foreign activity rebounded early this year, driven in part by strong growth in China, as the lifting of COVID-19 restrictions unleashed pent-up demand and some fiscal stimulus was front-loaded. More recent indicators from China, however, suggest that momentum is slowing. Growth in emerging Asia excluding China has also picked up on strong private domestic consumption and increased tourism

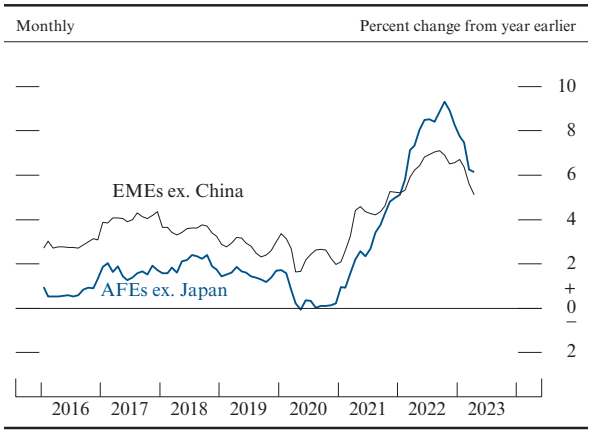
activity, which more than offset weakness in goods exports.

In Europe, the effects of the energy shock stemming from Russia's war against Ukraine were tempered in part by an unusually warm winter and successful adaptation efforts by businesses and households. The fading drag from energy prices as they decline from their elevated levels is now contributing to an economic recovery amid stronger consumer and business confidence. That said, in many parts of the globe, tighter monetary policy is starting to weigh on credit growth and investment.

Headline inflation abroad continued to ease, but core inflation remains sticky

Foreign headline inflation continued to fall as global energy prices have declined (figure 40). However, despite the recent fall in global agricultural commodity prices, food inflation in some regions (especially Europe) remains elevated, likely reflecting dislocations resulting from the pandemic and the war against Ukraine (figure 41). Core inflation in the foreign economies remains high, driven in part

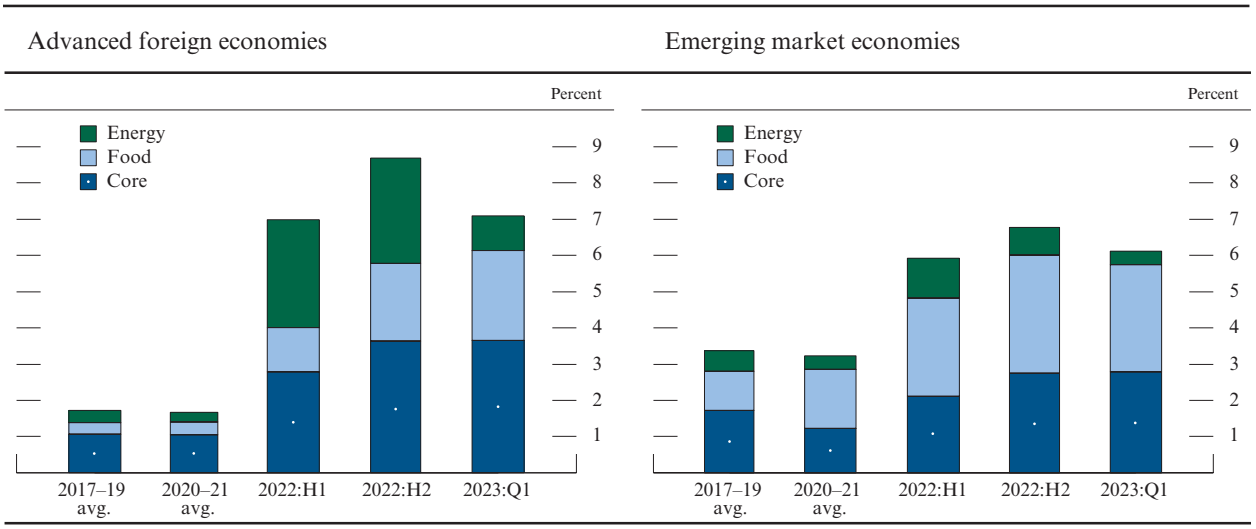
40. Consumer price inflation in foreign economies



NOTE: The advanced foreign economy (AFE) aggregate is the average of Canada, the euro area, and the U.K., weighted by shares of U.S. non-oil goods imports. The emerging market economy (EME) aggregate is the average of Argentina, Brazil, Chile, Colombia, Hong Kong, India, Indonesia, Israel, Malaysia, Mexico, the Philippines, Russia, Saudi Arabia, Singapore, South Korea, Taiwan, Thailand, and Vietnam, weighted by shares of U.S. non-oil goods imports. The inflation measure is the Harmonised Index of Consumer Prices for the euro area and the consumer price index for other economies. Data extend through April 2023.

SOURCE: Federal Reserve Board staff calculations; Haver Analytics.

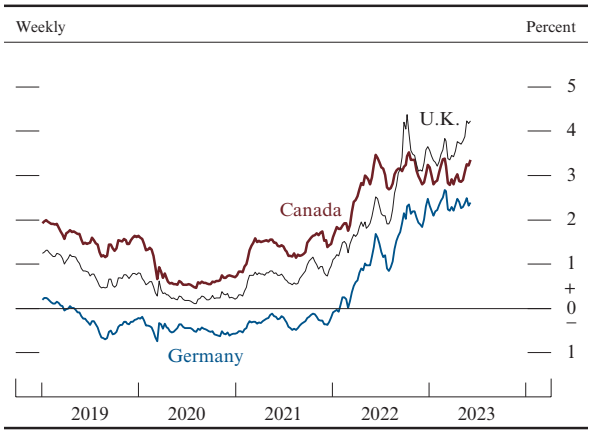
41. Foreign consumer price inflation components



NOTE: The advanced foreign economy aggregate is the average of Canada, the euro area, and the U.K., weighted by shares of U.S. non-oil goods imports. The emerging market economy aggregate is the average of Argentina, Brazil, Chile, Colombia, Hong Kong, India, Indonesia, Israel, Malaysia, Mexico, the Philippines, Russia, Saudi Arabia, Singapore, South Korea, Taiwan, Thailand, and Vietnam, weighted by shares of U.S. non-oil goods imports. The inflation measure is the Harmonised Index of Consumer Prices for the euro area and the consumer price index for other economies. The key identifies bars in order from top to bottom. The data show percent changes from year-ago levels.

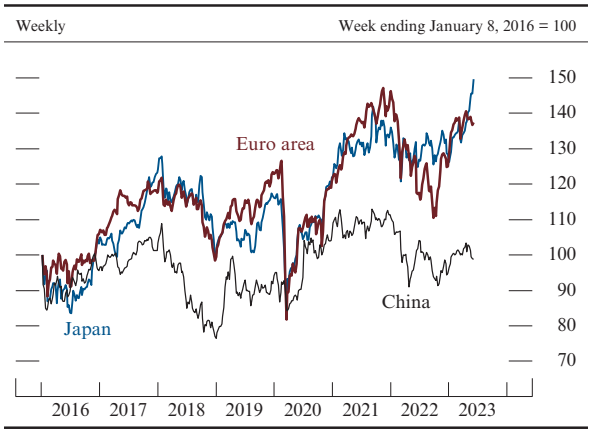
SOURCE: Federal Reserve Board staff calculations; Haver Analytics.

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



NOTE: The data are weekly averages of daily benchmark yields and extend through June 9, 2023.
SOURCE: Bloomberg.

43. Equity indexes for selected foreign economies



NOTE: The data are weekly averages of daily data and extend through June 9, 2023.
SOURCE: For the euro area, Dow Jones Euro Stoxx Index; for Japan, Tokyo Stock Price Index; for China, Shanghai Composite Index; all via Bloomberg. (For Dow Jones Indices licensing information, see the note on the Contents page.)

by tight labor markets and pass-through from past energy price increases into other prices.

Foreign central banks remain focused on reining in inflation

Central banks in most advanced foreign economies (AFEs) have pressed ahead with rate hikes, pointing to persistently high inflation and strong labor markets. Policy rate paths implied by market pricing suggest that many AFE central banks are expected to hike policy rates further, though most will reach a point later in the year when they will stop raising rates. In the emerging market economies (EMEs), some central banks have already paused policy rate hikes, including Brazil, Mexico, and South Korea. In light of the upside risks to inflation, most major foreign central banks emphasize that additional policy tightening may be needed to meet their objectives.

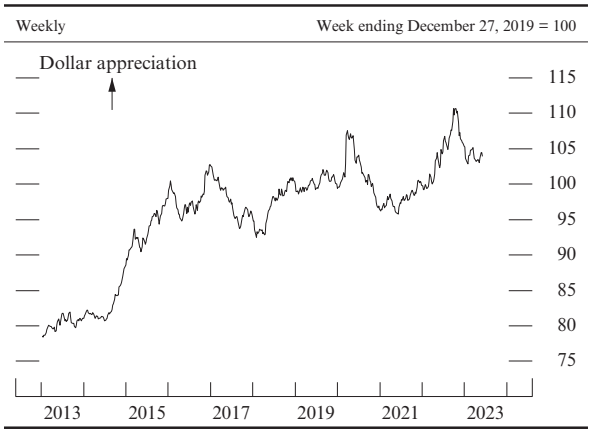
Financial conditions abroad are relatively little changed on net

Longer-term sovereign yields in the AFEs are little changed, on net, since January (figure 42). One exception is the U.K., where 10-year gilt yields increased notably on the back of accelerating core price pressures, high wage gains, and expectations shifting toward a tighter stance of monetary policy.

Major foreign equity indexes rose across advanced and emerging economies (figure 43). Euro-area corporate credit spreads narrowed slightly, consistent with the resilience of economic activity in the region. Inflows into EME-focused investment funds, which had strengthened at the beginning of the year, have slowed to near zero, while EME sovereign spreads were little changed.

Since January, the dollar was mixed against major currencies, leaving the broad dollar index—a measure of the trade-weighted value of the dollar against foreign currencies—a touch lower (figure 44). The dollar depreciated significantly against the Mexican peso amid resilient growth and tight monetary policy in Mexico. By contrast, the dollar appreciated modestly against Asian currencies amid weaker external demand in the region and widening interest rate differentials.

44. U.S. dollar exchange rate index



NOTE: The data, which are in foreign currency units per dollar, are weekly averages of daily values of the broad dollar index and extend through June 9, 2023. As indicated by the arrow, increases in the data reflect U.S. dollar appreciation and decreases reflect U.S. dollar depreciation.

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

Part 2
Monetary Policy

The Federal Open Market Committee continued to increase the federal funds rate . . .

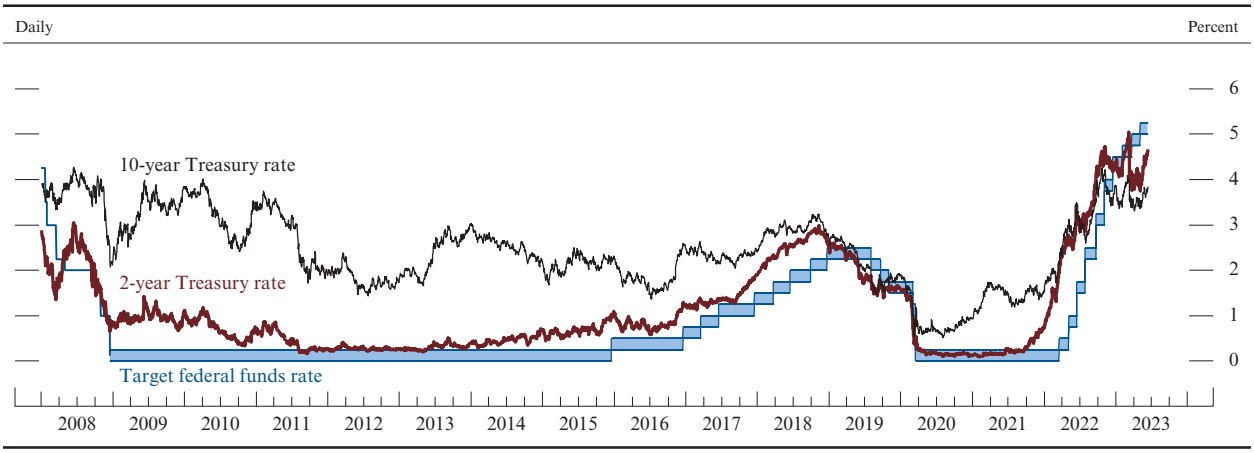
With inflation still well above the Federal Open Market Committee's (FOMC) 2 percent objective and with labor market conditions remaining very tight, the FOMC continued to raise the target range for the federal funds rate. Since January, the FOMC raised the target range 75 basis points, from 4¼ to 4½ percent to 5 to 5¼ percent (figure 45). Credit conditions had already tightened in response to the FOMC's policy actions and appeared to tighten further following the emergence of banking-sector strains in March. In light of the cumulative tightening of monetary policy and the lags with which monetary policy affects economic activity and inflation, the FOMC slowed the pace of policy firming relative to late 2022, raising the target range 25 basis points at its January, March, and May meetings, and held the range steady at its June meeting. In determining the extent of additional policy firming that may be appropriate to return inflation to 2 percent over time, the FOMC will take into account the cumulative tightening of monetary policy, the lags with which monetary policy affects economic activity and inflation, and economic and financial developments. The FOMC indicated that it will continue to monitor the implications of incoming information for the economic outlook and would be prepared to adjust the stance of monetary policy if risks emerge that could impede the attainment of the FOMC's goals.

. . . and has continued the process of significantly reducing its holdings of Treasury and agency securities

The FOMC began reducing its securities holdings in June 2022 and, since then, has continued to implement its plan for significantly reducing the size of the Federal Reserve's balance sheet in a predictable manner.[16] Since September 2022, principal payments from securities held in the System

16. See the May 4, 2022, press release regarding the Plans for Reducing the Size of the Federal Reserve's Balance Sheet, available on the Board's website at https://www.federalreserve.gov/newsevents/pressreleases/monetary20220504b.htm.

45. Selected interest rates



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

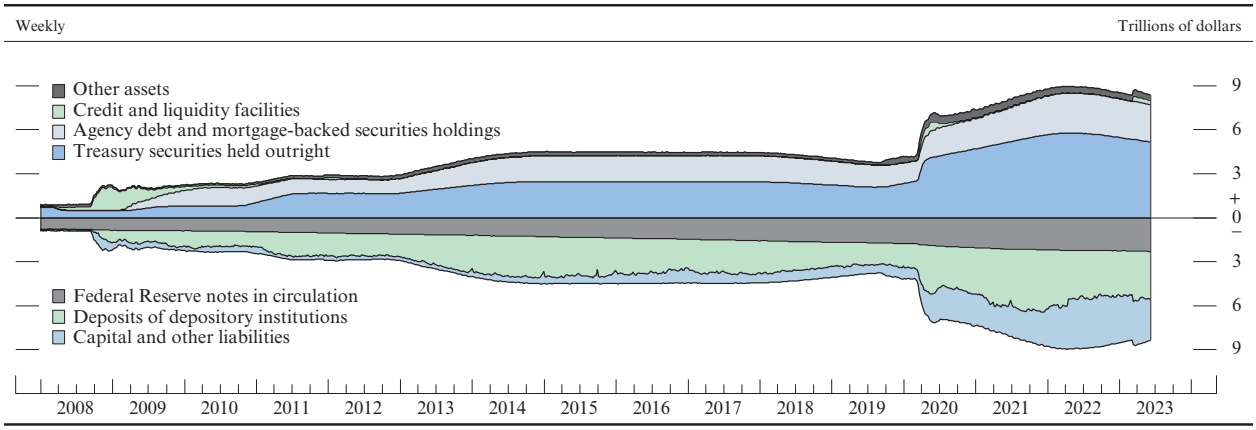
Open Market Account (SOMA) have been reinvested only to the extent that they exceeded monthly caps of $60 billion per month for Treasury securities and $35 billion per month for agency mortgage-backed securities. As a result of these actions, holdings of Treasury and agency securities in the SOMA have declined by about $420 billion since the start of January to around $7.7 trillion, a level equivalent to about 29 percent of U.S. nominal gross domestic product (figure 46). Despite this decline in SOMA holdings, reserve balances have risen by about $330 billion to around $3.3 trillion, mainly because of increased liquidity provision to banks and lower balances in the Treasury General Account. (See the box "Developments in the Federal Reserve's Balance Sheet and Money Markets.")

The FOMC has stated that it intends to maintain securities holdings in amounts needed to implement monetary policy efficiently and effectively in its ample-reserves regime. To ensure a smooth transition, the FOMC intends to slow and then stop reductions in its securities holdings when reserve balances are somewhat above the level the FOMC judges to be consistent with ample reserves. Once balance sheet runoff has ceased, reserve balances will likely continue to decline at a slower pace—reflecting growth in other Federal Reserve liabilities—until the FOMC judges that reserve balances are at the level required for efficiently implementing monetary policy. Thereafter, the FOMC will manage securities holdings as needed to maintain ample reserves over time.

The FOMC will continue to monitor the implications of incoming information for the economic outlook

The FOMC is strongly committed to returning inflation to its 2 percent objective. In assessing the appropriate stance of monetary policy, the FOMC will continue to monitor the implications of incoming information for the economic outlook. The FOMC's assessments will take into account a wide range of information, including readings on labor market conditions, inflation pressures and inflation expectations, and financial and international developments. The FOMC has noted that it is also prepared to adjust any of

46. Federal Reserve assets and liabilities



NOTE: "Other assets" includes repurchase agreements, FIMA (Foreign and International Monetary Authorities) repurchase agreements, and unamortized premiums and discounts on securities held outright. "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. "Agency debt and mortgage-backed securities holdings" includes agency residential mortgage-backed securities and agency commercial mortgage-backed securities. "Capital and other liabilities" includes reverse repurchase agreements, the U.S. Treasury General Account, and the U.S. Treasury Supplementary Financing Account. The key identifies shaded areas in order from top to bottom. The data extend through June 7, 2023.

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

the details of its approach to reducing the size of the balance sheet in light of economic and financial developments.

In addition to considering a wide range of economic and financial data, the FOMC gathers information from business contacts and other informed parties around the country, as summarized in the Beige Book. To hear from a broad range of stakeholders in the U.S. economy about how monetary policy affects people's daily lives and livelihoods, the Federal Reserve has continued to gather insights through the *Fed Listens* initiative and the Federal Reserve System's community development outreach. Policymakers also routinely consult prescriptions for the policy interest rate provided by various monetary policy rules. These rule prescriptions can provide useful benchmarks for the FOMC. Although simple rules cannot capture all of 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 in the Current Environment").

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

The Federal Open Market Committee (FOMC) continued to reduce the size of the Federal Reserve's System Open Market Account portfolio. Since the time of the previous report, total securities have declined $226 billion to about $7.7 trillion. Amid banking-sector developments, depository institutions (DIs) borrowed from the discount window and the Federal Reserve introduced a new facility in mid-March, the Bank Term Funding Program (BTFP), making additional funding available to eligible DIs to help ensure banks have the ability to meet the needs of all their depositors. Driven by this increase in loans, total assets have increased $49 billion, leaving the total size of the balance sheet at about $8.4 trillion (figures A and B). This discussion reviews recent developments in the Federal Reserve's balance sheet and money market conditions.

Amid banking-sector developments, discount window borrowing by DIs peaked at just over $150 billion in mid-March before declining to $3 billion as other credit extensions—which consist of loans that were extended to DIs that were subsequently placed into Federal Deposit Insurance Corporation (FDIC) receivership, including DIs established by the FDIC—increased to $185 billion.[1] Furthermore, to support American businesses and households, the Federal Reserve Board made additional funding available to eligible DIs through the creation of the new BTFP under the authority of section 13(3) of the Federal Reserve Act, with approval of the Secretary of the Treasury.[2] The BTFP offers loans of up to one year in length to banks, savings associations, credit unions,

(continued)

A. Balance sheet comparison

Billions of dollars

	June 7, 2023	March 1, 2023	Change
Assets			
Total securities			
Treasury securities	5,162	5,336	−174
Agency debt and MBS	2,560	2,612	−52
Net unamortized premiums	298	308	−10
Repurchase agreements	0	0	0
Loans and lending facilities			
PPPLF	8	11	−3
Discount window	3	4	−1
BTFP	100	0	100
Other credit extensions	185	0	185
Other loans and lending facilities	28	30	−2
Central bank liquidity swaps	0	0	0
Other assets	44	38	6
Total assets	**8,389**	**8,340**	**49**
Liabilities			
Federal Reserve notes	2,293	2,254	39
Reserves held by depository institutions	3,306	3,028	278
Reverse repurchase agreements			
Foreign official and international accounts	347	367	−20
Others	2,162	2,134	28
U.S. Treasury General Account	77	351	−274
Other deposits	208	180	28
Other liabilities and capital	−4	26	−30
Total liabilities and capital	**8,389**	**8,340**	**49**

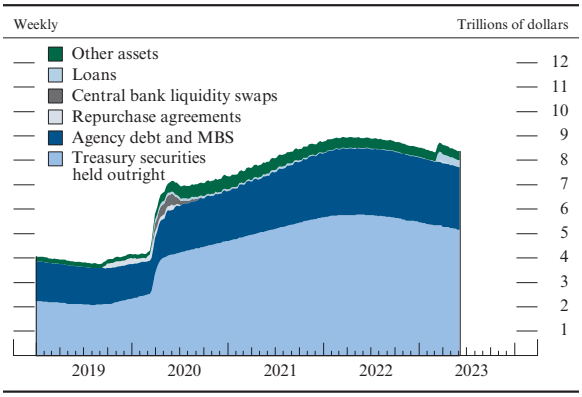
NOTE: MBS is mortgage-backed securities. PPPLF is Paycheck Protection Program Liquidity Facility. BTFP is Bank Term Funding Program. Components may not sum to totals because of rounding.

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

1. The Federal Reserve Banks' loans to these DIs are secured by pledged collateral, and the FDIC provides repayment guarantees.

2. On March 12, with the announcement of the BTFP, changes were announced for the discount window. These changes included the application of the same margins used

B. Federal Reserve assets



NOTE: MBS is mortgage-backed securities. The key identifies shaded areas in order from top to bottom. The data extend through June 7, 2023.

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

and other eligible DIs against collateral such as U.S. Treasury securities, U.S. agency securities, and U.S. agency mortgage-backed securities.[3] Loans under the BTFP are secured by eligible collateral valued at par—that is, the face amount of the securities—and can be requested until at least March 11, 2024. Currently, the Federal Reserve has $100 billion of BTFP loans outstanding to eligible counterparties. Federal Reserve lending at the discount window, under the BTFP, and through other credit extensions has led to a small increase in total assets since March.

Usage of the overnight reverse repurchase agreement (ON RRP) facility averaged around $2.2 trillion since the beginning of March amid abundant liquidity in the banking system and limited Treasury bill supply (figure C). In addition, uncertainty about the economic outlook—and, as a result, about the magnitude and pace of policy rate increases—continued to contribute to a preference for short-duration assets, like those provided by the ON RRP facility. ON RRP usage dropped slightly in the immediate aftermath of banking-sector stress in mid-March, as money market mutual funds diverted some of their funds to other investments, such as Federal Home Loan Bank discount notes.[4] The ON RRP facility is intended to help keep the effective federal funds rate within the target range. The facility continued to serve this intended purpose, and the Federal Reserve's administered rates—interest on reserve balances and the ON RRP offering rate—were highly effective at maintaining the effective federal funds rate within the target range as the FOMC has tightened the stance of monetary policy.

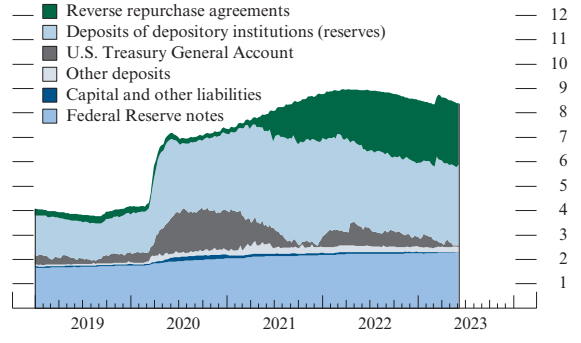
Reserve balances—the largest liability of the Federal Reserve's balance sheet—have increased by about $278 billion since March 2023, driven by the increase in Federal Reserve lending to DIs and a $274 billion decline in the Treasury General Account.[5]

Net income of the Federal Reserve continued to be negative, and the deferred asset that the Federal Reserve balance sheet now reports—as the Federal Reserve no longer has positive net income to remit to the Treasury Department—grew by about $30 billion to $68 billion since the previous report. The deferred asset is equal to the cumulative shortfall of net income and represents the amount of future net income that will need to be realized before remittances to the Treasury resume.[6] Negative net income and the associated deferred asset do not affect the Federal Reserve's conduct of monetary policy or its ability to meet its financial obligations.[7]

for the securities eligible for the BTFP, further increasing the lendable value of collateral at the discount window.

3. The collateral eligible under the BTFP includes any collateral that is eligible for purchase by the Federal Reserve Banks in open market operations (see 12 C.F.R. § 201.108(b)).

C. Federal Reserve liabilities



NOTE: "Capital and other liabilities" includes Treasury contributions and is negative on June 7, 2023, because of the deferred asset that the Federal Reserve reports. The key identifies shaded areas in order from top to bottom. The data extend through June 7, 2023.

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

4. In order to meet funding needs, Federal Home Loan Banks (FHLBs) increased the supply of FHLB discount notes in the immediate aftermath of the banking-sector stress in mid-March.

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

6. Although remittances are suspended at the time of this report, over the past decade and a half, the Federal Reserve has remitted over $1 trillion to the Treasury.

7. Net income is expected to again turn positive as interest expenses fall, and remittances will resume once the temporary deferred asset falls to zero. As a result of the ongoing reduction in the size of the Federal Reserve's balance sheet, it is expected that interest expenses will fall over time in line with the decline in the Federal Reserve's liabilities.

Monetary Policy Rules in the Current Environment

As part of their monetary policy deliberations, policymakers consult the prescriptions of a variety of simple interest rate rules without mechanically following the prescriptions of any particular rule. 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 current deviation of inflation from its target value and a measure of resource slack in the economy.

Since 2021, inflation has run well above the Federal Open Market Committee's (FOMC) 2 percent longer-run objective, and labor market conditions have been very tight over the past year. As a result, the simple monetary policy rules considered in this discussion have called for elevated levels of the federal funds rate. Reflecting the continued, unacceptably high level of inflation, the FOMC has raised the target range for the federal funds rate by 5 percentage points in just over a year and has reduced its holdings of Treasury securities and agency debt and agency mortgage-backed securities at a historically rapid pace.

Selected Policy Rules: Descriptions

In many economic models, desirable economic outcomes can be achieved if monetary policy responds in a predictable way to changes in economic conditions. In recognition of this idea, 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.[1] Figure A shows these rules, along with a "balanced-approach (shortfalls)" rule, which responds to the unemployment rate only when it is higher than its longer-run level.[2] All of these simple rules shown embody key design principles of good monetary policy, including that the policy rate should be adjusted forcefully enough over time to ensure a return of inflation to the central bank's longer-run objective and to anchor longer-term inflation expectations at levels consistent with that objective.

All five rules feature the difference between inflation and the FOMC's longer-run objective of 2 percent. The five rules use 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.[3] All but the first-difference rule include an estimate of the neutral real interest rate in the longer run (r_t^{LR}).[4]

(continued)

1. The Taylor (1993) rule was introduced in John B. Taylor (1993), "Discretion versus Policy Rules in Practice," Carnegie-Rochester Conference Series on Public Policy, vol. 39 (December), pp. 195–214. The balanced-approach rule was analyzed in John B. Taylor (1999), "A Historical Analysis of Monetary Policy Rules," in John B. Taylor, ed., *Monetary Policy Rules* (Chicago: University of Chicago Press), pp. 319–41. The adjusted Taylor (1993) rule was studied in David Reifschneider and John C. Williams (2000), "Three Lessons for Monetary Policy in a Low-Inflation Era," *Journal of Money, Credit and Banking,* vol. 32 (November), pp. 936–66. The first-difference rule is based on a rule suggested by Athanasios Orphanides (2003), "Historical Monetary Policy Analysis and the Taylor Rule," *Journal of Monetary Economics,* vol. 50 (July), pp. 983–1022. A review of policy rules is in John B. Taylor and John C. Williams (2011), "Simple and Robust Rules for Monetary Policy," in Benjamin M. Friedman and Michael Woodford, eds., *Handbook of Monetary Economics,* vol. 3B (Amsterdam: North-Holland), pp. 829–59. The same volume of the *Handbook of Monetary Economics* also discusses approaches other than policy rules for deriving policy rate prescriptions.

2. The balanced-approach (shortfalls) rule responds asymmetrically to unemployment rates above or below their estimated longer-run value: When unemployment is above that value, the policy rates are identical to those prescribed by the balanced-approach rule, whereas when unemployment is below that value, policy rates do not rise because of further declines in the unemployment rate. As a result, the prescription of the balanced-approach (shortfalls) rule in 2023:Q1 is less restrictive than that of the balanced-approach rule.

3. Implementations of simple rules often use the output gap as a measure of resource slack in the economy. The rules described in figure A instead use the unemployment rate gap because that gap better captures the FOMC's statutory goal to promote maximum employment. Movements in these alternative measures of resource utilization tend to be highly correlated. For more information, see the note below figure A.

4. The neutral real interest rate in the longer run (r_t^{LR}) is the level of the real federal funds rate that is expected to be consistent, in the longer run, with maximum employment and stable inflation. Like u_t^{LR}, r_t^{LR} is determined largely by nonmonetary factors. The first-difference rule shown in figure A does not require an estimate of r_t^{LR}, a feature that is touted by proponents of such rules as providing an element of robustness. 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.

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-1} denotes the midpoint of the target range for the federal funds rate for quarter $t-1$, u_t is the unemployment rate in quarter t, and r_t^{LR} is the level of the neutral real federal funds rate in the longer run that is expected to be consistent with sustaining maximum employment and inflation at the Federal Open Market Committee's 2 percent longer-run objective, represented by π^{LR}. π_t denotes the realized 4-quarter price inflation for quarter t. In addition, u_t^{LR} is the rate of unemployment expected in the longer run. Z_t is the cumulative sum of past deviations of the federal funds rate from the prescriptions of the Taylor (1993) rule when that rule prescribes setting the federal funds rate below an effective lower bound (ELB) of 12.5 basis points.

The Taylor (1993) rule and other policy rules generally respond to the deviation of real output from its full capacity level. In these equations, the output gap has been replaced with the gap between the rate of unemployment in the longer run and its actual level (using a relationship known as Okun's law) to represent the rules in terms of the unemployment rate. The rules are implemented as responding to core personal consumption expenditures (PCE) inflation rather than to headline PCE inflation because current and near-term core inflation rates tend to outperform headline inflation rates as predictors of the medium-term behavior of headline inflation. Box note 1 provides references for the policy rules.

Unlike the other simple rules featured here, the adjusted Taylor (1993) rule recognizes that the federal funds rate cannot be reduced materially below the effective lower bound (ELB). By contrast, during the pandemic-induced recession, the standard Taylor (1993) rule prescribed policy rates that were sharply lower than the ELB. To make up for the cumulative shortfall in policy accommodation following a recession during which the federal funds rate is constrained by its ELB, the adjusted Taylor (1993) rule prescribes delaying the return of the policy rate to the (positive) levels prescribed by the standard Taylor (1993) rule until after the economy begins to recover.

Policy Rules: Limitations

Simple policy rules are also subject to important limitations. One important limitation is that simple policy rules were designed and tested under very different economic conditions than those faced at present. In addition, the simple policy rules respond to only a small set of economic variables and thus necessarily abstract from many of the factors that the FOMC considers when it assesses the appropriate setting of the policy rate. Another important limitation is that most simple policy rules do not take into account the ELB on interest rates, which limits the extent to which the policy rate can be lowered to support the economy. This constraint was particularly evident during the pandemic-driven recession, when the lower bound on the policy rate motivated the FOMC's other policy actions to support the economy. Relatedly, another limitation is that simple policy rules do not take into account the other tools of monetary policy, such as balance sheet policies. Finally, simple policy rules generally abstract from the risk-management considerations associated with uncertainty about economic relationships and the evolution of the economy.

Selected Policy Rules: Prescriptions

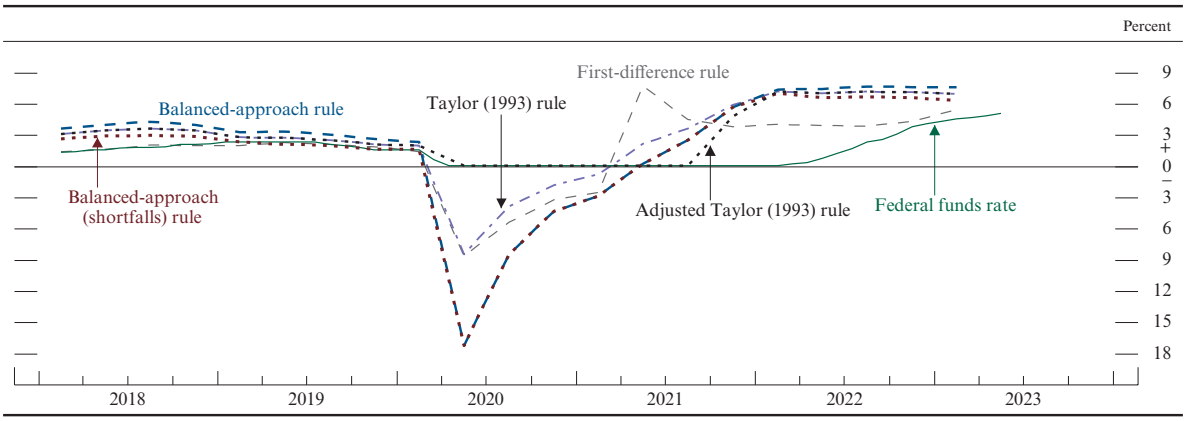
Figure B shows historical quarterly prescriptions for the federal funds rate under the five simple rules

(continued on next page)

Monetary Policy Rules in the Current Environment *(continued)*

considered. For each quarterly period, the figure reports the policy rates prescribed by the rules, taking as given the prevailing economic conditions and survey-based estimates of u_t^{LR} and r_t^{LR} at the time. All of the rules considered called for a highly accommodative stance for monetary policy in response to the pandemic-driven recession, followed by values above the ELB as inflation picked up and labor market conditions strengthened. Over the past year, the prescriptions of the simple rules for the federal funds rate were between 4 and 8 percent; these values are well above the levels observed before the pandemic and reflect, in large part, elevated inflation readings. Since early 2022, the FOMC has raised the target range for the federal funds rate by 5 percentage points to attain a stance of monetary policy that will be sufficiently restrictive to return inflation to 2 percent over time.

B. Historical federal funds rate prescriptions from simple policy rules



NOTE: The rules use historical values of core personal consumption expenditures inflation, the unemployment rate, and, where applicable, historical values of the midpoint of the target range for the federal funds rate. Quarterly projections of longer-run values for the federal funds rate and the unemployment rate used in the computation of the rules' prescriptions are derived through interpolations of biannual projections from Blue Chip Economic Indicators. The longer-run value for inflation is set to 2 percent. The rules' prescriptions are quarterly, and the federal funds rate data are the monthly average of the daily midpoint of the target range for the federal funds rate.

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

Part 3
Summary of Economic Projections

The following material was released after the conclusion of the June 13–14, 2023, meeting of the Federal Open Market Committee.

In conjunction with the Federal Open Market Committee (FOMC) meeting held on June 13–14, 2023, 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 2023 to 2025 and over the longer run. Each participant's projections were based on information available at the time of the meeting, together with her or his assessment of appropriate monetary policy—including a path for the federal funds rate and its longer-run value—and assumptions about other factors likely to affect economic outcomes. The longer-run projections represent each participant's assessment of the value to which each variable would be expected to converge, over time, under appropriate monetary policy and in the absence of further shocks to the economy. "Appropriate monetary policy" is defined as the future path of policy that each participant deems most likely to foster outcomes for economic activity and inflation that best satisfy his or her individual interpretation of the statutory mandate to promote maximum employment and price stability.

Table 1. Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents, under their individual assumptions of projected appropriate monetary policy, June 2023

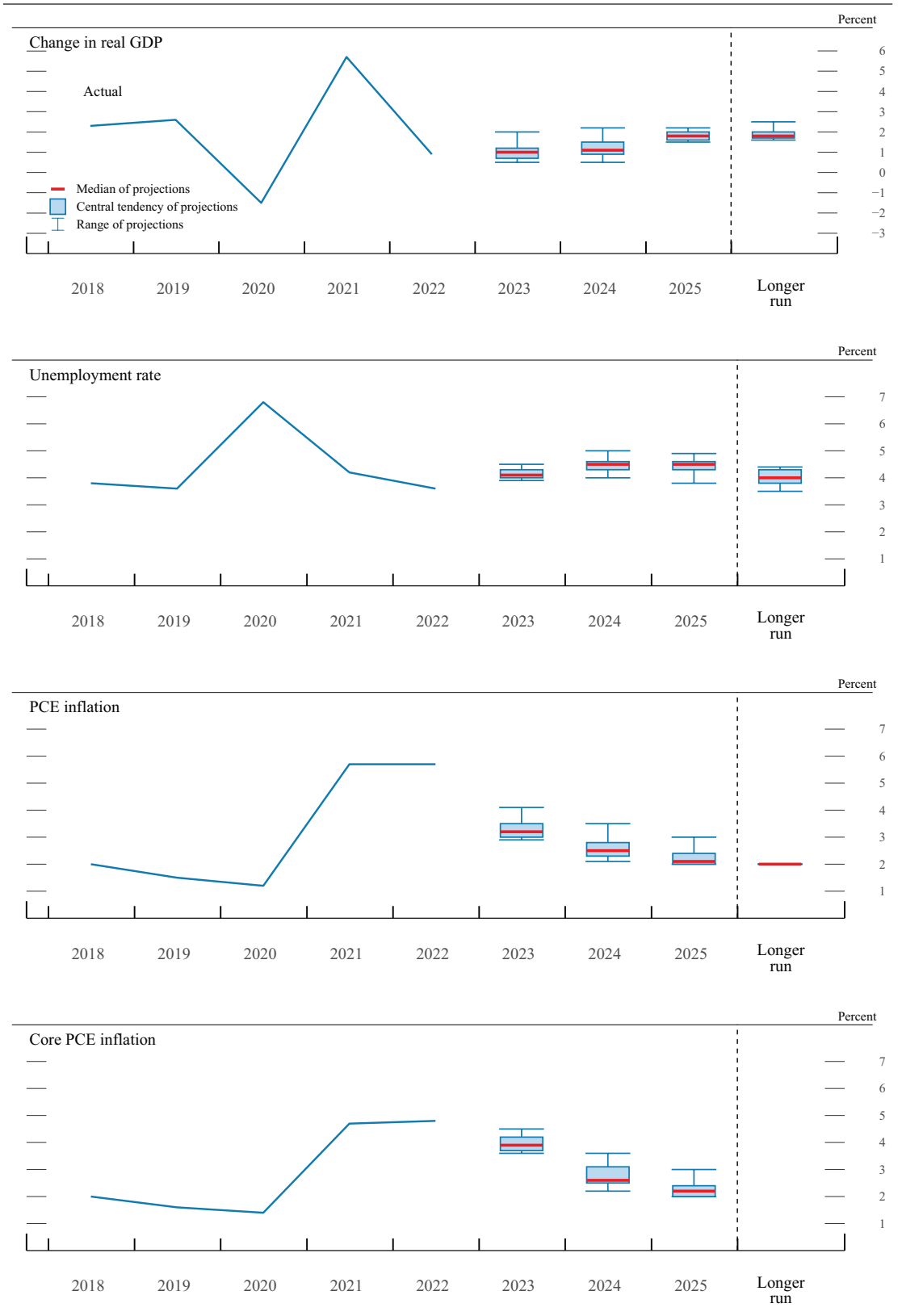
Percent

Variable	Median[1]				Central tendency[2]				Range[3]			
	2023	2024	2025	Longer run	2023	2024	2025	Longer run	2023	2024	2025	Longer run
Change in real GDP	1.0	1.1	1.8	1.8	0.7–1.2	0.9–1.5	1.6–2.0	1.7–2.0	0.5–2.0	0.5–2.2	1.5–2.2	1.6–2.5
March projection	0.4	1.2	1.9	1.8	0.0–0.8	1.0–1.5	1.7–2.1	1.7–2.0	-0.2–1.3	0.3–2.0	1.5–2.2	1.6–2.5
Unemployment rate	4.1	4.5	4.5	4.0	4.0–4.3	4.3–4.6	4.3–4.6	3.8–4.3	3.9–4.5	4.0–5.0	3.8–4.9	3.5–4.4
March projection	4.5	4.6	4.6	4.0	4.0–4.7	4.3–4.9	4.3–4.8	3.8–4.3	3.9–4.8	4.0–5.2	3.8–4.9	3.5–4.7
PCE inflation	3.2	2.5	2.1	2.0	3.0–3.5	2.3–2.8	2.0–2.4	2.0	2.9–4.1	2.1–3.5	2.0–3.0	2.0
March projection	3.3	2.5	2.1	2.0	3.0–3.8	2.2–2.8	2.0–2.2	2.0	2.8–4.1	2.0–3.5	2.0–3.0	2.0
Core PCE inflation[4]	3.9	2.6	2.2		3.7–4.2	2.5–3.1	2.0–2.4		3.6–4.5	2.2–3.6	2.0–3.0	
March projection	3.6	2.6	2.1		3.5–3.9	2.3–2.8	2.0–2.2		3.5–4.1	2.1–3.1	2.0–3.0	
Memo: Projected appropriate policy path												
Federal funds rate	5.6	4.6	3.4	2.5	5.4–5.6	4.4–5.1	2.9–4.1	2.5–2.8	5.1–6.1	3.6–5.9	2.4–5.6	2.4–3.6
March projection	5.1	4.3	3.1	2.5	5.1–5.6	3.9–5.1	2.9–3.9	2.4–2.6	4.9–5.9	3.4–5.6	2.4–5.6	2.3–3.6

Note: Projections of change in real gross domestic product (GDP) and projections for both measures of inflation are percent changes from the fourth quarter of the previous year to the fourth quarter of the year indicated. PCE inflation and core PCE inflation are the percentage rates of change in, respectively, the price index for personal consumption expenditures (PCE) and the price index for PCE excluding food and energy. Projections for the unemployment rate are for the average civilian unemployment rate in the fourth quarter of the year indicated. Each participant's projections are based on his or her assessment of appropriate monetary policy. Longer-run projections represent each participant's assessment of the rate to which each variable would be expected to converge under appropriate monetary policy and in the absence of further shocks to the economy. The projections for the federal funds rate are the value of the midpoint of the projected appropriate target range for the federal funds rate or the projected appropriate target level for the federal funds rate at the end of the specified calendar year or over the longer run. The March projections were made in conjunction with the meeting of the Federal Open Market Committee on March 21–22, 2023. One participant did not submit longer-run projections for the change in real GDP, the unemployment rate, or the federal funds rate in conjunction with the March 21–22, 2023, meeting, and one participant did not submit such projections in conjunction with the June 13–14, 2023, meeting.

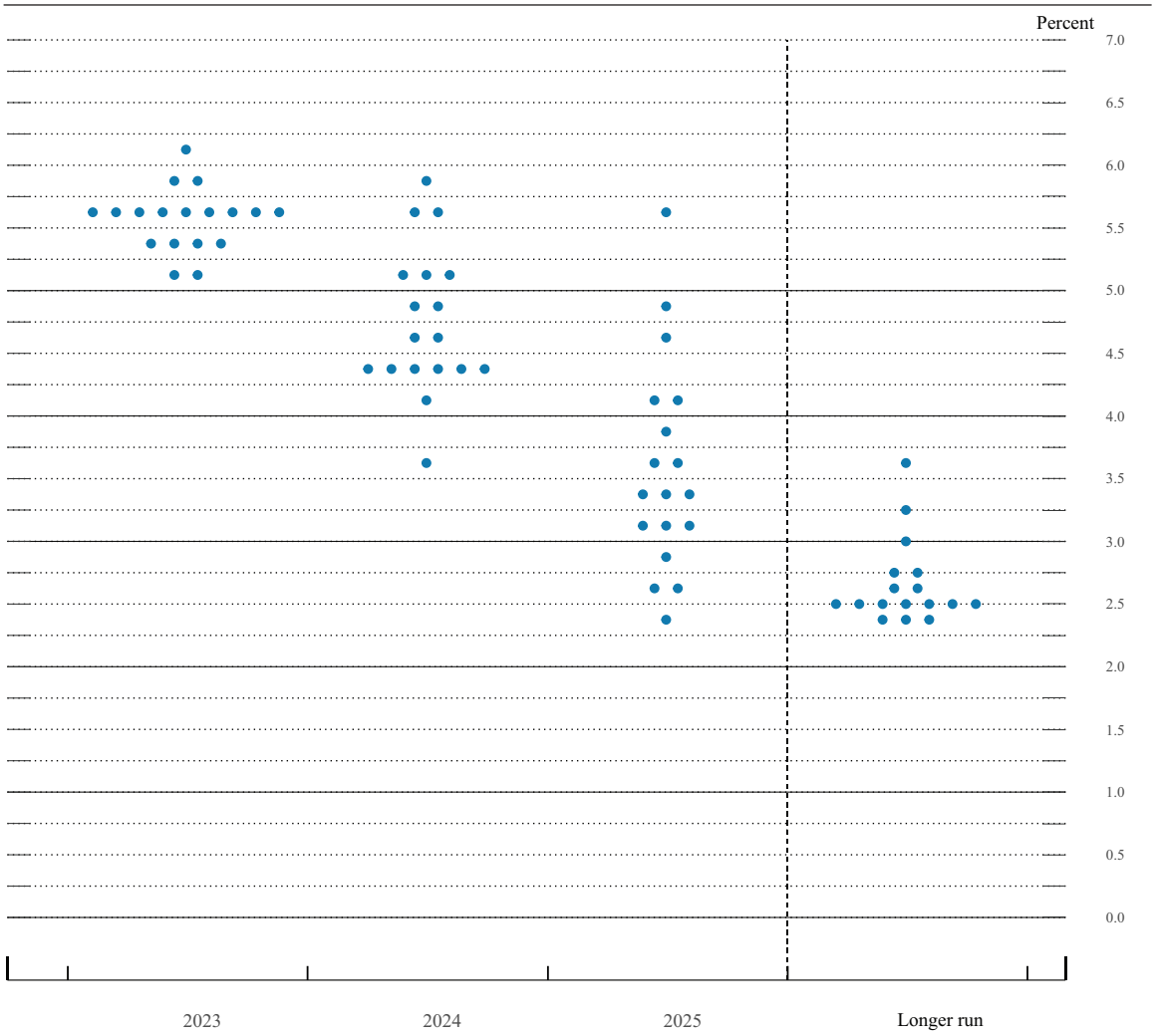
1. For each period, the median is the middle projection when the projections are arranged from lowest to highest. When the number of projections is even, the median is the average of the two middle projections.
2. The central tendency excludes the three highest and three lowest projections for each variable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

Figure 1. Medians, central tendencies, and ranges of economic projections, 2023–25 and over the longer run



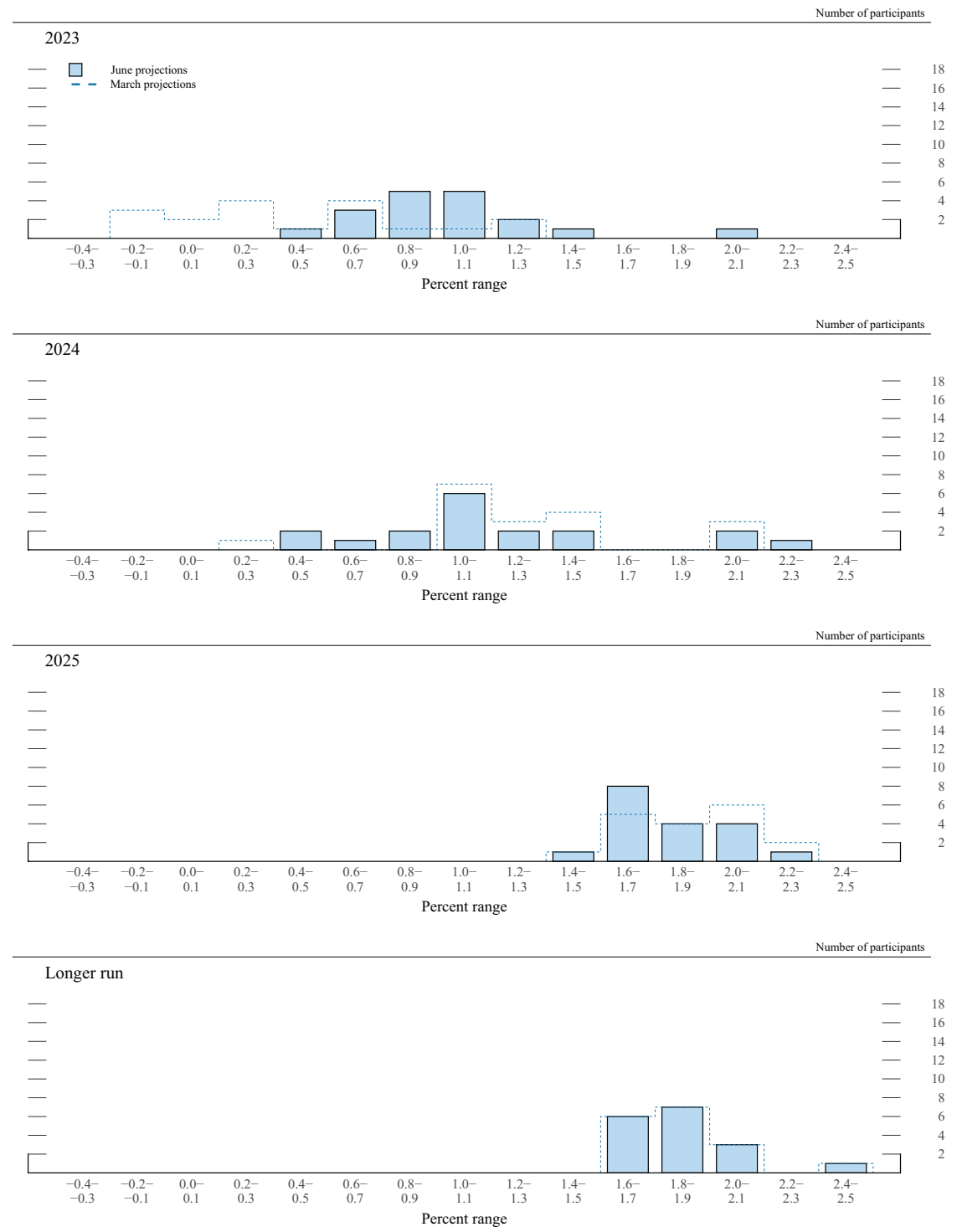
NOTE: Definitions of variables and other explanations are in the notes to table 1. The data for the actual values of the variables are annual.

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



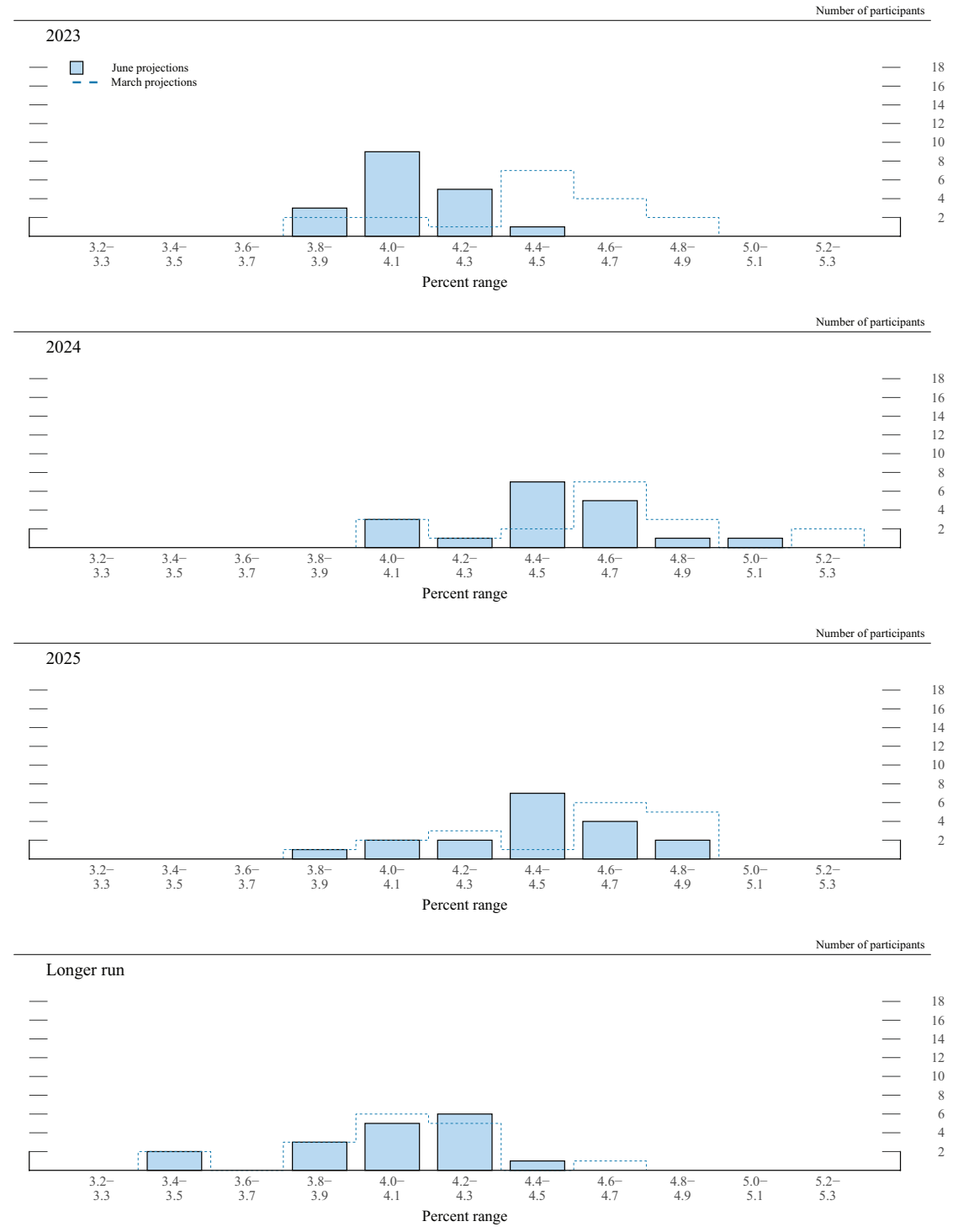
NOTE: Each shaded circle indicates the value (rounded to the nearest 1/8 percentage point) of an individual participant's judgment of the midpoint of the appropriate target range for the federal funds rate or the appropriate target level for the federal funds rate at the end of the specified calendar 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, 2023–25 and over the longer run



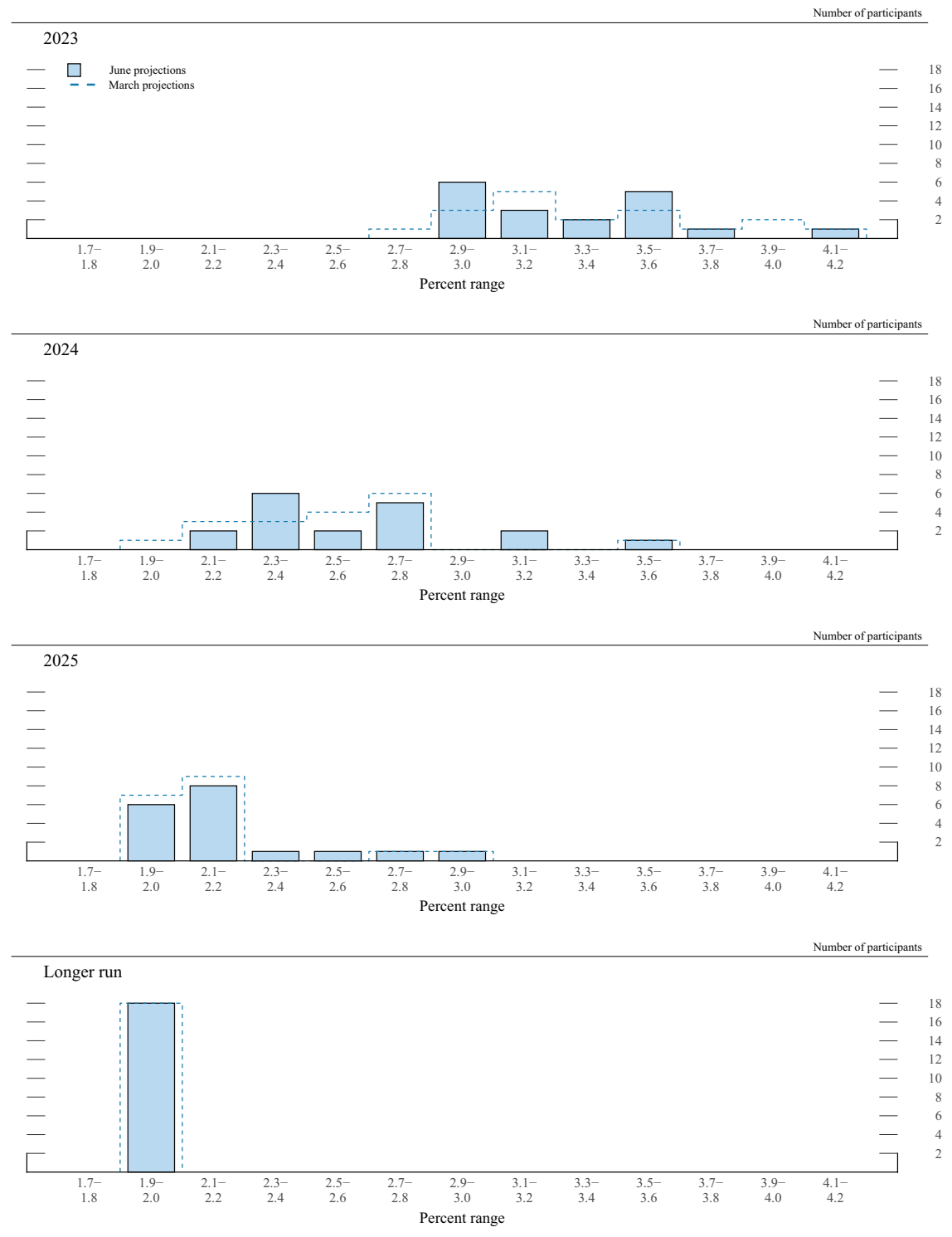
NOTE: Definitions of variables and other explanations are in the notes to table 1.

Figure 3.B. Distribution of participants' projections for the unemployment rate, 2023–25 and over the longer run



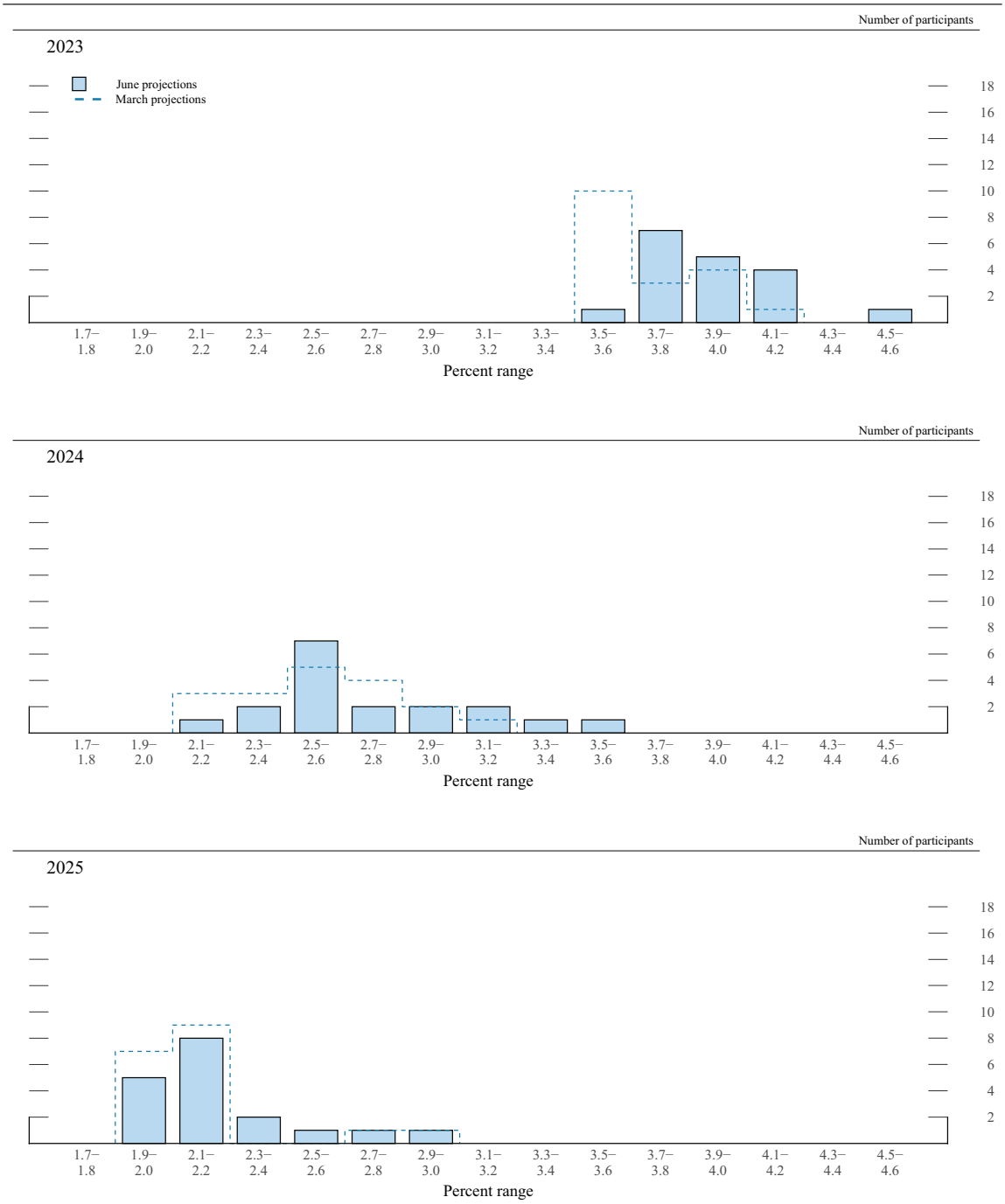
NOTE: Definitions of variables and other explanations are in the notes to table 1.

Figure 3.C. Distribution of participants' projections for PCE inflation, 2023–25 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, 2023–25

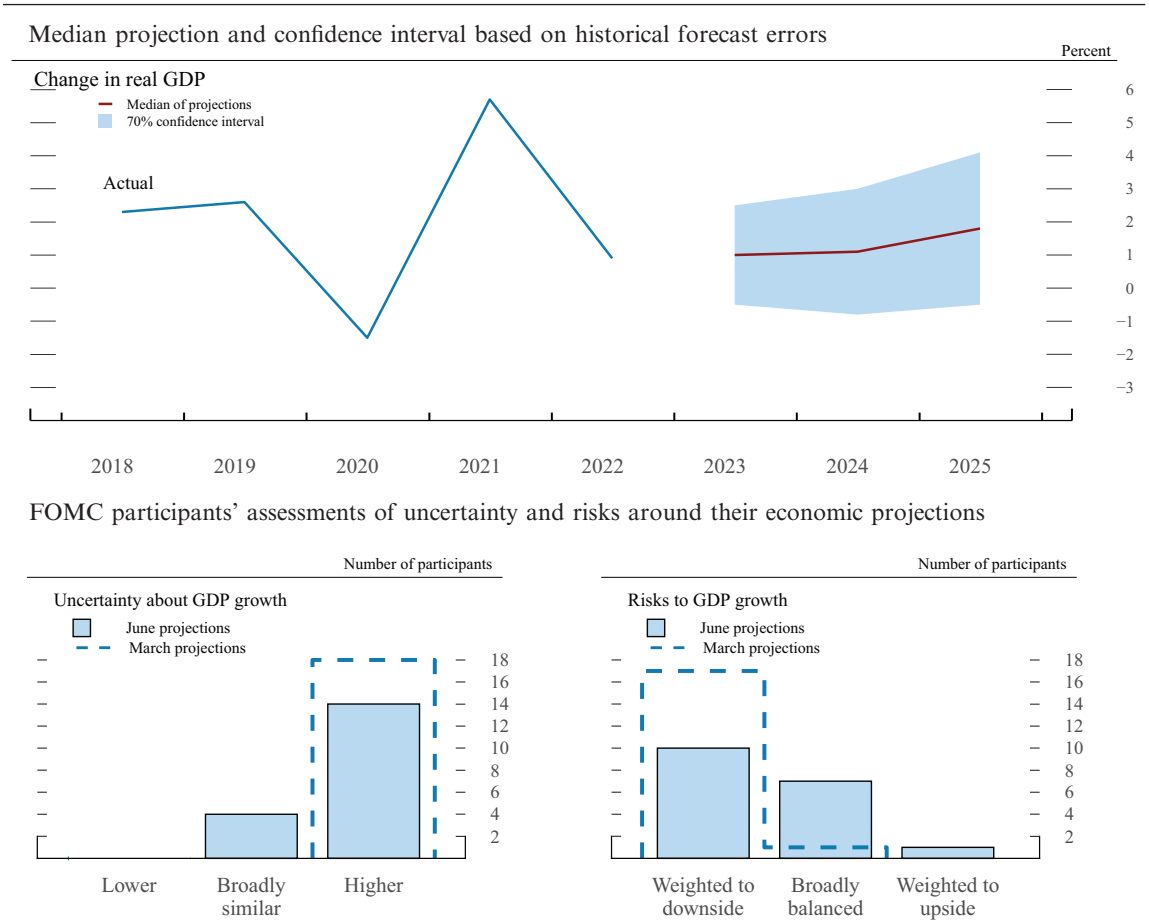


NOTE: Definitions of variables and other explanations are in the notes to table 1.

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, 2023–25 and over the longer run

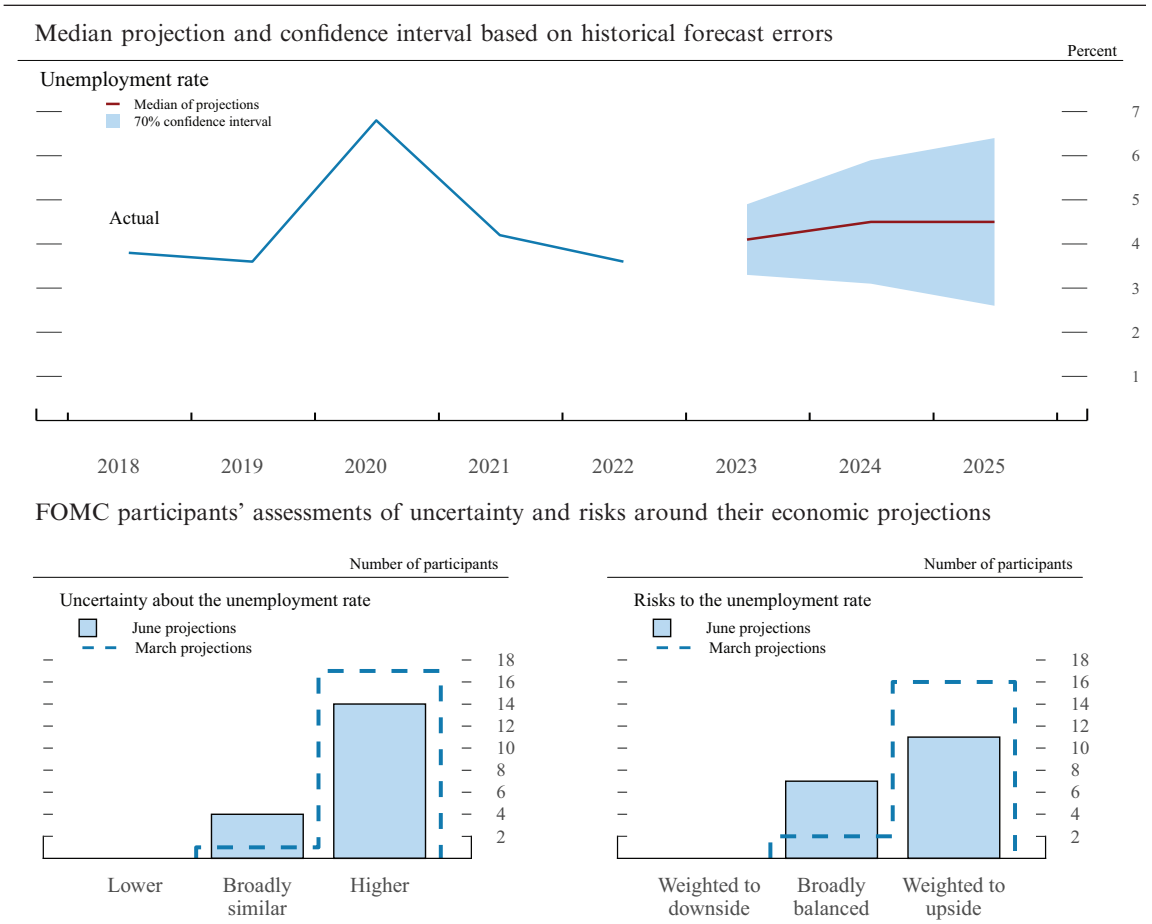
NOTE: Definitions of variables and other explanations are in the notes to table 1.

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



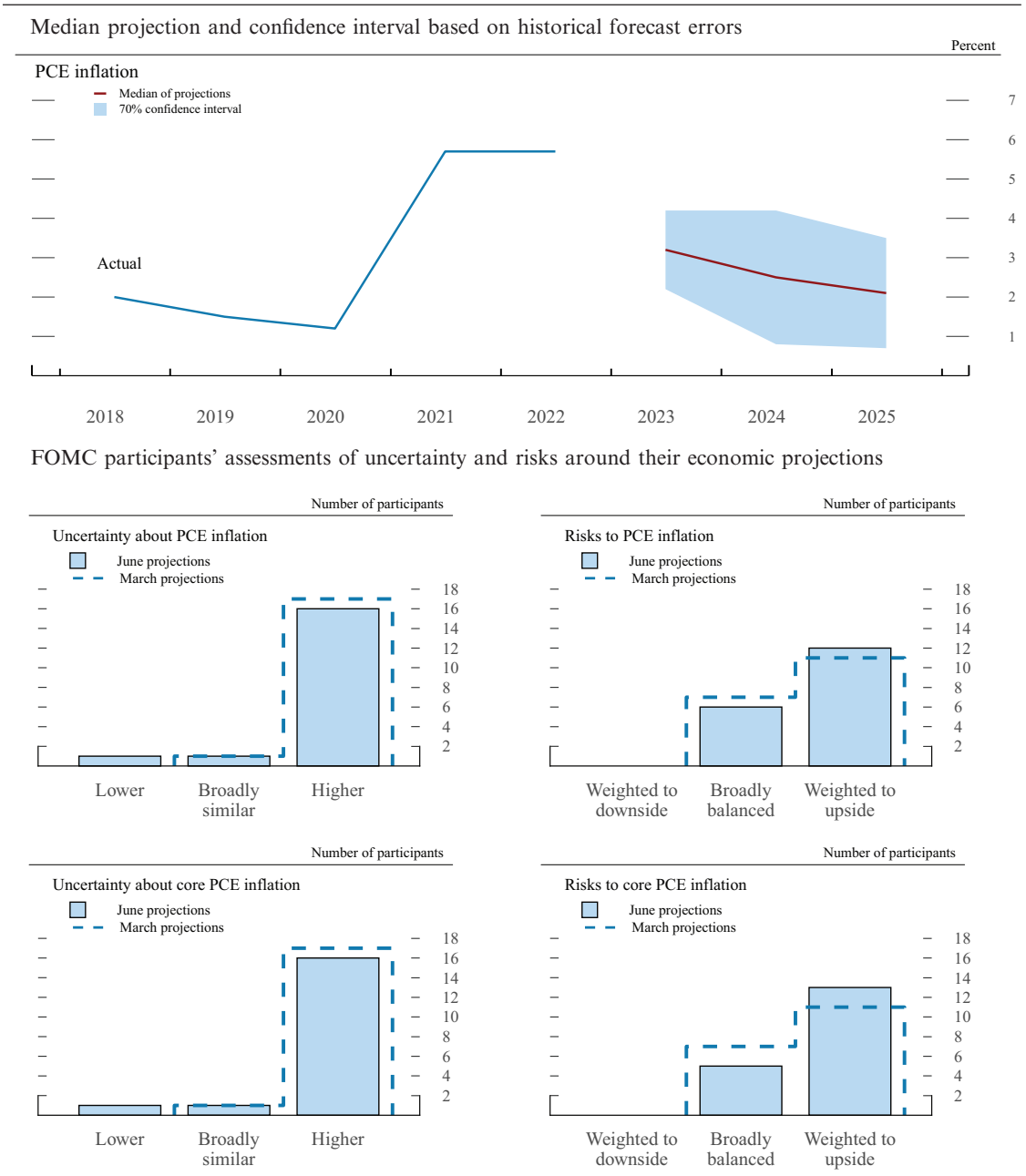
NOTE: The blue and red lines in the top panel show actual values and median projected values, respectively, of the percent change in real gross domestic product (GDP) from the fourth quarter of the previous year to the fourth quarter of the year indicated. The confidence interval around the median projected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



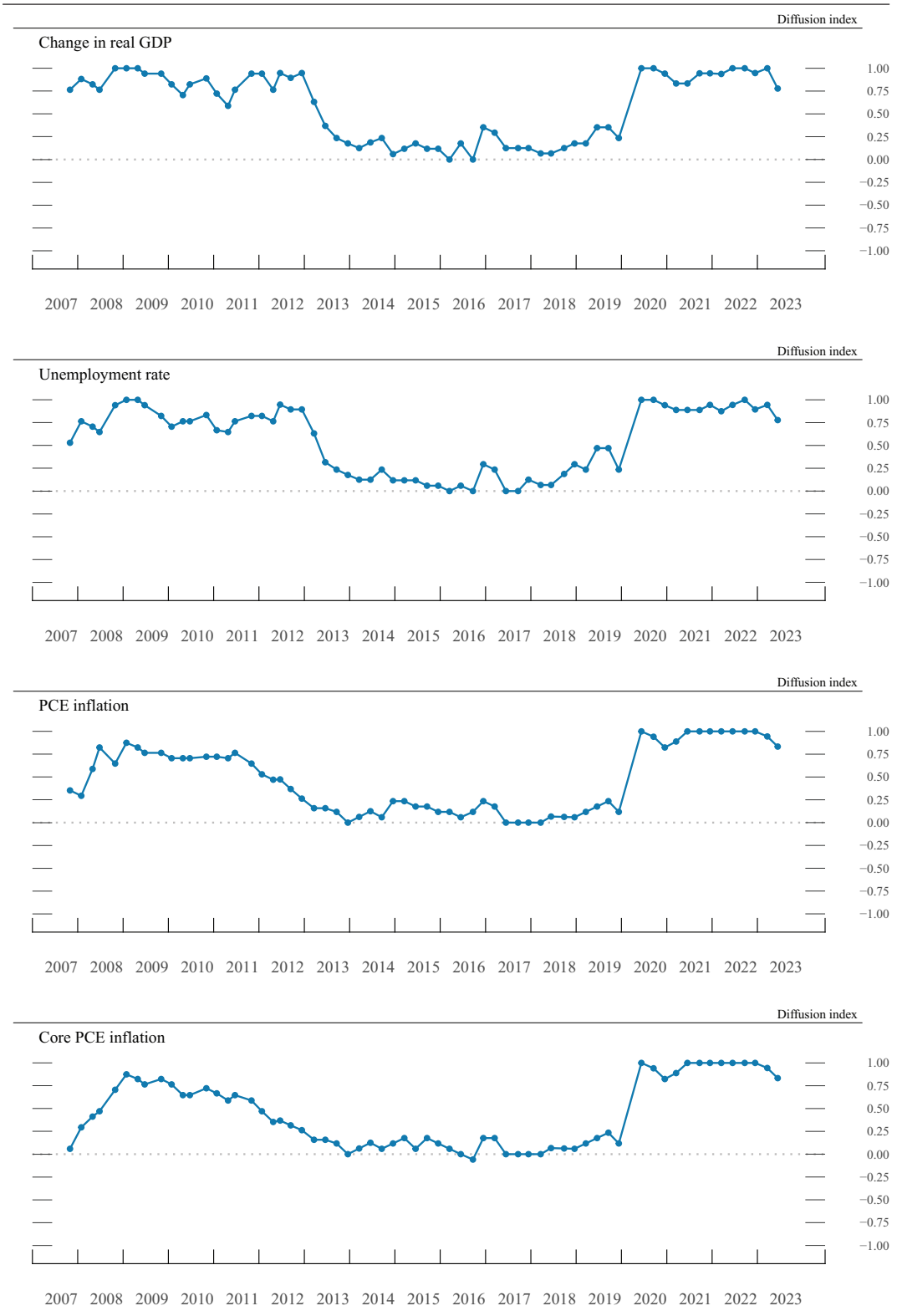
NOTE: The blue and red lines in the top panel show actual values and median projected values, respectively, of the average civilian unemployment rate in the fourth quarter of the year indicated. The confidence interval around the median projected values is assumed to be symmetric and is based on root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



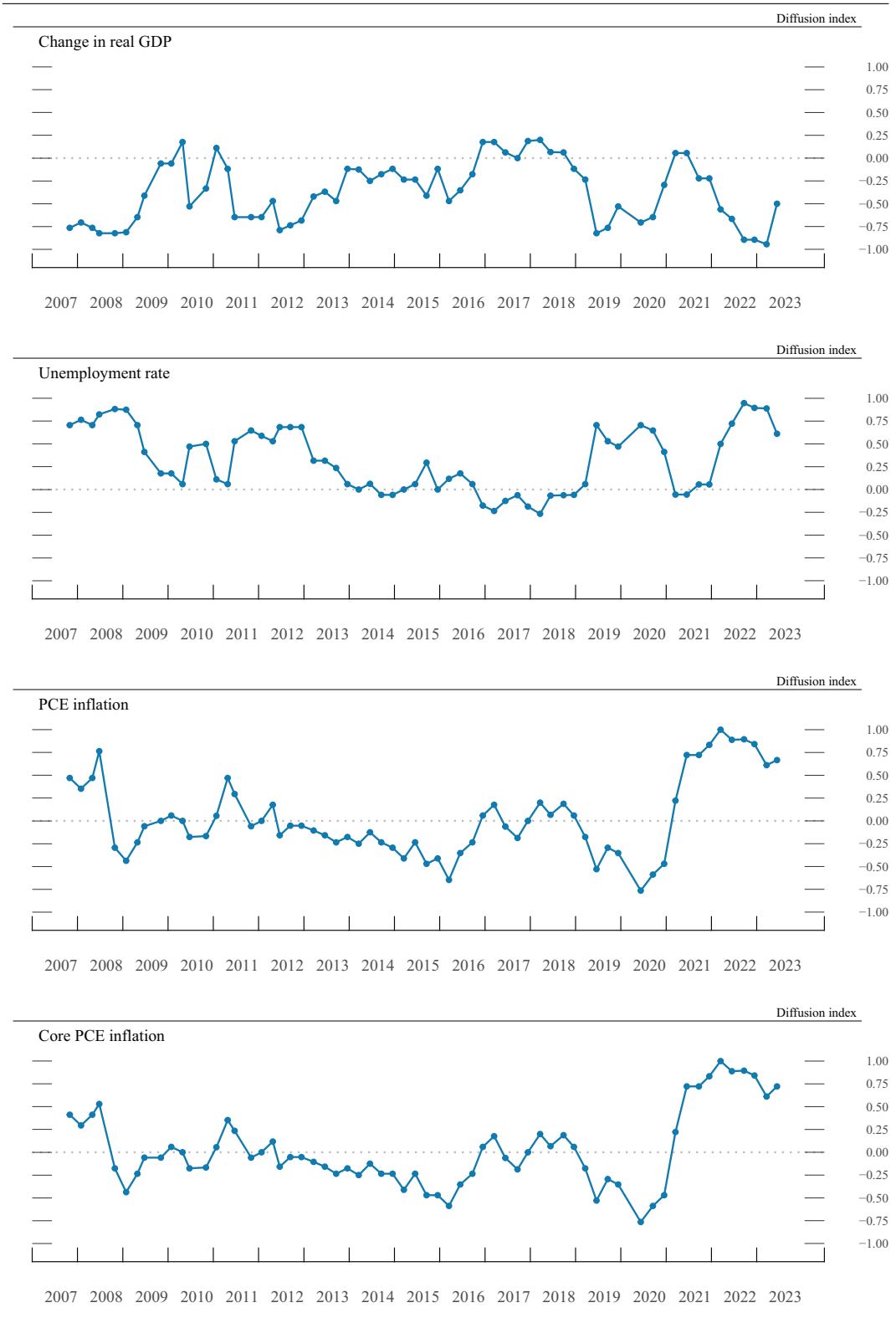
NOTE: The blue and red lines in the top panel show actual values and median projected values, respectively, of the percent change in the price index for personal consumption expenditures (PCE) from the fourth quarter of the previous year to the fourth quarter of the year indicated. The confidence interval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



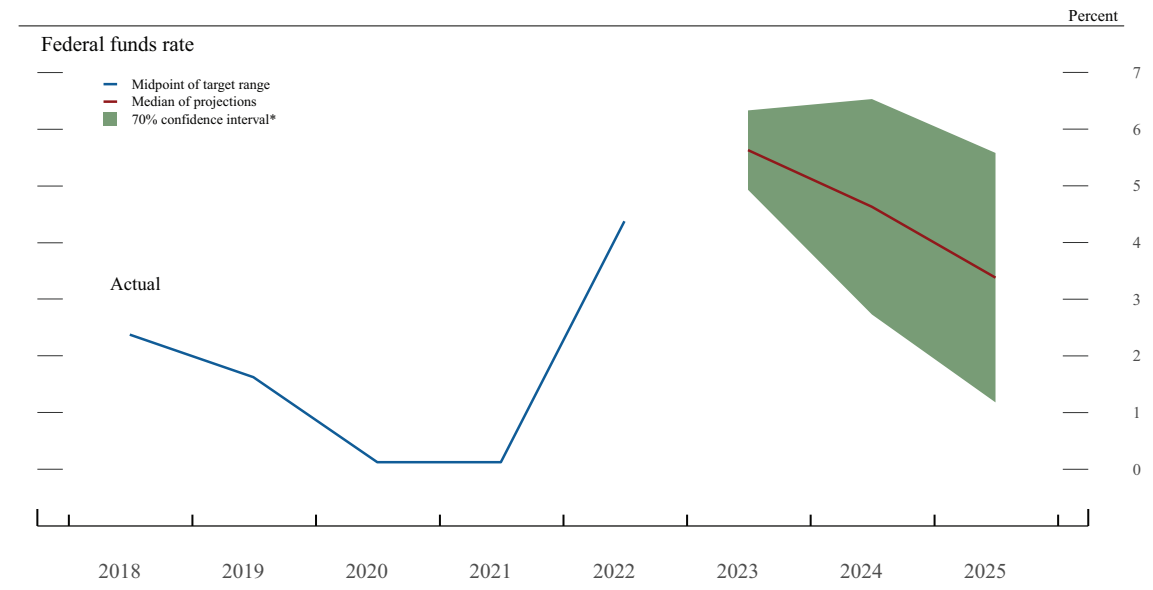
NOTE: For each SEP, participants provided responses to the question "Please indicate your judgment of the uncertainty attached to your projections relative to the levels of uncertainty over the past 20 years." Each point in the diffusion indexes represents the number of participants who responded "Higher"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

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

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

Table 2. Average historical projection error ranges

Percentage points

Variable	2023	2024	2025
Change in real GDP[1]	± 1.5	± 1.9	± 2.3
Unemployment rate[1]	± 0.8	± 1.4	± 1.9
Total consumer prices[2]	± 1.0	± 1.7	± 1.4
Short-term interest rates[3]	± 0.7	± 1.9	± 2.2

NOTE: Error ranges shown are measured as plus or minus the root mean squared error of projections for 2003 through 2022 that were released in the summer by various private and government forecasters. As described in the box "Forecast Uncertainty," under certain assumptions, there is about a 70 percent probability that actual outcomes for real GDP, unemployment, consumer prices, and the federal funds rate will be in ranges implied by the average size of projection errors made in the past. For more information, see David Reifschneider and Peter Tulip (2017), "Gauging the Uncertainty of the Economic Outlook Using Historical Forecasting Errors: The Federal Reserve's Approach," Finance and Economics Discussion Series 2017-020 (Washington: Board of Governors of the Federal Reserve System, February), https://dx.doi.org/10.17016/FEDS.2017.020.

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

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

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

Forecast Uncertainty

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

Table 2 summarizes the average historical accuracy of a range of forecasts, including those reported in past *Monetary Policy Report*s and those prepared by the Federal Reserve Board's staff in advance of meetings of the Federal Open Market Committee (FOMC). The projection error ranges shown in the table illustrate the considerable uncertainty associated with economic forecasts. For example, suppose a participant projects that real gross domestic product (GDP) and total consumer prices will rise steadily at annual rates of, respectively, 3 percent and 2 percent. If the uncertainty attending those projections is similar to that experienced in the past and the risks around the projections are broadly balanced, the numbers reported in table 2 would imply a probability of about 70 percent that actual GDP would expand within a range of 1.5 to 4.5 percent in the current year, 1.1 to 4.9 percent in the second year, and 0.7 to 5.3 percent in the third year. The corresponding 70 percent confidence intervals for overall inflation would be 1.0 to 3.0 percent in the current year, 0.3 to 3.7 percent in the second year, and 0.6 to 3.4 percent in the third 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' current assessments of the uncertainty surrounding their projections are summarized in the bottom-left

(continued)

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
AUM	assets under management
BLS	Bureau of Labor Statistics
BTFP	Bank Term Funding Program
C&I	commercial and industrial
COVID-19	coronavirus disease 2019
CRE	commercial real estate
DI	depository institution
DPI	disposable personal income
ELB	effective lower bound
EME	emerging market economy
EPOP ratio	employment-to-population ratio
FDIC	Federal Deposit Insurance Corporation
FOMC	Federal Open Market Committee; also, the Committee
GDP	gross domestic product
G-SIBs	global systemically important banks
MBS	mortgage-backed securities
MMF	money market fund
ON RRP	overnight reverse repurchase agreement
OPEC	Organization of the Petroleum Exporting Countries
PCE	personal consumption expenditures
repo	repurchase agreement
SLOOS	Senior Loan Officer Opinion Survey on Bank Lending Practices
SOMA	System Open Market Account
S&P	Standard & Poor's
SVB	Silicon Valley Bank
VIX	implied volatility for the S&P 500 index