

MONETARY POLICY REPORT

March 1, 2024



Board of Governors of the Federal Reserve System

LETTER OF TRANSMITTAL



BOARD OF GOVERNORS OF THE
FEDERAL RESERVE SYSTEM

Washington, D.C., March 1, 2024

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,

A handwritten signature in black ink that reads "Jerome H. Powell". The signature is written in a cursive, flowing style.

Jerome H. Powell, Chair

STATEMENT ON LONGER-RUN GOALS AND MONETARY POLICY STRATEGY

Adopted effective January 24, 2012; as reaffirmed effective January 30, 2024

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

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

The maximum level of employment is a broad-based and inclusive goal that is not directly measurable and changes over time owing largely to nonmonetary factors that affect the structure and dynamics of the labor market. Consequently, it would not be appropriate to specify a fixed goal for employment; rather, the Committee's policy decisions must be informed by assessments of the shortfalls of employment from its maximum level, recognizing that such assessments are necessarily uncertain and subject to revision. The Committee considers a wide range of indicators in making these assessments.

The inflation rate over the longer run is primarily determined by monetary policy, and hence the Committee has the ability to specify a longer-run goal for inflation. The Committee reaffirms its judgment that inflation at the rate of 2 percent, as measured by the annual change in the price index for personal consumption expenditures, is most consistent over the longer run with the Federal Reserve's statutory mandate. The Committee judges that longer-term inflation expectations that are well anchored at 2 percent foster price stability and moderate long-term interest rates and enhance the Committee's ability to promote maximum employment in the face of significant economic disturbances. In order to anchor longer-term inflation expectations at this level, the Committee seeks to achieve inflation that averages 2 percent over time, and therefore judges that, following periods when inflation has been running persistently below 2 percent, appropriate monetary policy will likely aim to achieve inflation moderately above 2 percent for some time.

Monetary policy actions tend to influence economic activity, employment, and prices with a lag. In setting monetary policy, the Committee seeks over time to mitigate shortfalls of employment from the Committee's assessment of its maximum level and deviations of inflation from its longer-run goal. Moreover, sustainably achieving maximum employment and price stability depends on a stable financial system. Therefore, the Committee's policy decisions reflect its longer-run goals, its medium-term outlook, and its assessments of the balance of risks, including risks to the financial system that could impede the attainment of the Committee's goals.

The Committee's employment and inflation objectives are generally complementary. However, under circumstances in which the Committee judges that the objectives are not complementary, it takes into account the employment shortfalls and inflation deviations and the potentially different time horizons over which employment and inflation are projected to return to levels judged consistent with its mandate.

The Committee intends to review these principles and to make adjustments as appropriate at its annual organizational meeting each January, and to undertake roughly every 5 years a thorough public review of its monetary policy strategy, tools, and communication practices.

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Note: This report reflects information that was publicly available as of noon EST on February 29, 2024.

Unless otherwise stated, the time series in the figures extend through, for daily data, February 27, 2024; for monthly data, January 2024; and, for quarterly data, 2023:Q4. In bar charts, except as noted, the change for a given period is measured to its final quarter from the final quarter of the preceding period.

For figures 33 and 40 as well as figure C in the box “Recent Housing Market Developments,” note that the S&P/Case-Shiller U.S. National Home Price Index, the S&P 500 Index, and the Dow Jones Bank Index are products of S&P Dow Jones Indices LLC and/or its affiliates and have been licensed for use by the Board. Copyright © 2024 S&P Dow Jones Indices LLC, a division of S&P Global, and/or its affiliates. All rights reserved. Redistribution, reproduction, and/or photocopying in whole or in part are prohibited without written permission of S&P Dow Jones Indices LLC. For more information on any of S&P Dow Jones Indices LLC’s indices, please visit www.spdji.com. S&P® is a registered trademark of Standard & Poor’s Financial Services LLC, and Dow Jones® is a registered trademark of Dow Jones Trademark Holdings LLC. Neither S&P Dow Jones Indices LLC, Dow Jones Trademark Holdings LLC, their affiliates, nor their third-party licensors make any representation or warranty, express or implied, as to the ability of any index to accurately represent the asset class or market sector that it purports to represent, and neither S&P Dow Jones Indices LLC, Dow Jones Trademark Holdings LLC, their affiliates, nor their third-party licensors shall have any liability for any errors, omissions, or interruptions of any index or the data included therein.

SUMMARY

While inflation remains above the Federal Open Market Committee's (FOMC) objective of 2 percent, it has eased substantially over the past year, and the slowing in inflation has occurred without a significant increase in unemployment. The labor market remains relatively tight, with the unemployment rate near historically low levels and job vacancies still elevated. Real gross domestic product (GDP) growth has also been strong, supported by solid increases in consumer spending.

The FOMC has maintained the target range for the federal funds rate at 5¼ to 5½ percent since its July 2023 meeting. The Committee views the policy rate as likely at its peak for this tightening cycle, which began in early 2022. The Federal Reserve has also continued to reduce its holdings of Treasury and agency mortgage-backed securities.

As labor market tightness has eased and progress on inflation has continued, the risks to achieving the Committee's employment and inflation goals have been moving into better balance. Even so, the Committee remains highly attentive to inflation risks and 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. In considering any adjustments to the target range for the federal funds rate, the Committee will carefully assess incoming data, the evolving outlook, and the balance of risks. The Committee does not expect it will be appropriate to reduce the target range until it has gained greater confidence that inflation is moving sustainably toward 2 percent.

Recent Economic and Financial Developments

Inflation. Consumer price inflation has slowed notably but remains above 2 percent.

The price index for personal consumption expenditures (PCE) rose 2.4 percent over the 12 months ending in January, down from a peak of 7.1 percent in 2022. The core PCE price index—which excludes volatile food and energy prices and is generally considered a better guide to the direction of future inflation—rose 2.8 percent in the 12 months ending in January, and the slowing in inflation was widespread across both goods and services prices. More recently, core PCE prices increased at an annual rate of 2.5 percent over the six months ending in January, though measuring inflation over relatively short periods risks exaggerating the influence of idiosyncratic or temporary factors. 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.

The labor market. The labor market has remained relatively tight, with job gains averaging 239,000 per month since June and the unemployment rate near historical lows. Labor demand has eased—as job openings have declined in many sectors of the economy—but continues to exceed the supply of available workers. Labor supply has trended higher over the past year, reflecting a continued strong pace of immigration and increases in the labor force participation rate, particularly among prime-age workers. Reflecting the improved balance between labor demand and supply, nominal wage gains slowed in 2023, but they remain above a pace consistent with 2 percent inflation over the longer term, given prevailing trends in productivity growth.

Economic activity. Real GDP increased 3.1 percent last year, notably faster than in 2022 despite tighter financial conditions, including elevated longer-term interest rates. Consumer spending grew at a solid pace, and housing market activity started to turn back up in the second half of last year after

having declined since early 2021. However, real business fixed investment growth slowed, likely reflecting tighter financial conditions and downbeat business sentiment. In contrast to GDP, manufacturing output was little changed, on net, last year, a downshift following two years of robust post-pandemic gains.

Financial conditions. Conditions in financial markets tightened considerably further over the summer and early fall before reversing course toward the end of the year. The FOMC raised the target range for the federal funds rate a further 25 basis points at its meeting last July, bringing the overall increase in the target range for this tightening cycle to 525 basis points. The market-implied expected path of the federal funds rate has moved up, on net, since the middle of 2023, and yields on longer-term nominal Treasury securities are notably higher on balance. Credit remains generally available to most households and businesses but at elevated interest rates, which have weighed on financing activity. Lending by banks to households and businesses slowed notably since June as banks continued to tighten standards and demand for loans softened.

Financial stability. Overall, the banking system remains sound and resilient; although acute stress in the banking system has receded since last March, a few areas of risk warrant continued monitoring. Upward pressure on asset valuations continued, with real estate prices elevated relative to rents and high price-to-earnings ratios in equity markets. Borrowing from nonfinancial businesses and households continued to increase at a pace slower than that of nominal GDP, and the combined debt-to-GDP ratio now sits close to its 20-year low. Vulnerabilities from financial-sector leverage remain notable. While risk-based bank capital ratios stayed solid and increased broadly, declines in the fair values of fixed-rate assets have been sizable relative to the regulatory capital at some banks. Meanwhile, leverage at hedge funds has stabilized at high levels, and leverage at life insurers increased to values close to

the historical averages but with a liability composition that has become more reliant on nontraditional sources of funding. Most banks maintained high liquidity and stable funding, while bank funding costs continue to increase. (See the box “Developments Related to Financial Stability” in Part 1.)

International developments. Following a rebound in early 2023, growth in foreign economic activity was subdued in the second half of last year. Economic growth was particularly weak in advanced foreign economies (AFEs) as monetary policy tightening weighed on activity and high inflation eroded real household incomes. Structural adjustment to higher energy prices in Europe continued to hinder economic performance, while property-sector weakness and sluggish domestic demand restrained Chinese economic activity. Foreign headline inflation has fallen further, reflecting declines in core and food inflation. However, the pace of disinflation has varied across countries and sectors, with the moderation in goods inflation generally outpacing that in services inflation.

Most foreign central banks paused policy interest rate hikes in the second half of last year and have since held rates steady. Policy rate paths implied by financial market pricing suggest that central banks in many AFEs are expected to begin lowering their policy rates in 2024. Several central banks in emerging market economies have already begun easing monetary policy. The trade-weighted exchange value of the U.S. dollar has increased slightly, on net, since the middle of last year.

Monetary Policy

Interest rate policy. After significantly tightening the stance of monetary policy since early 2022, the FOMC has maintained the target range for the policy rate at 5¼ to 5½ percent since its meeting last July. Although the FOMC judges that the risks to achieving its employment and inflation goals are moving into better balance, the Committee

remains highly attentive to inflation risks. The Committee has indicated that it does not expect it will be appropriate to reduce the target range until it has gained greater confidence that inflation is moving sustainably toward 2 percent. In considering any adjustments to the target range for the federal funds rate, the Committee will carefully assess incoming data, the evolving outlook, and the balance of risks.

Balance sheet policy. The Federal Reserve has continued the process of significantly reducing its holdings of Treasury and agency securities in a predictable manner, contributing to the tightening of financial conditions.¹ Beginning in June 2022, principal payments from securities held in the System Open Market Account have been reinvested only to the extent that they exceeded monthly caps. Under this policy, the Federal Reserve has reduced its securities holdings about \$640 billion since mid-June 2023, bringing the total reduction in securities holdings since the start of balance sheet runoff to about \$1.4 trillion. The FOMC has stated that it intends to maintain securities holdings at amounts consistent with implementing 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 that the FOMC judges to be consistent with ample reserves.

Special Topics

Employment and earnings across groups. An exceptionally tight labor market over the past two years has been especially beneficial for historically disadvantaged groups of workers. As a result, many of the long-standing disparities in employment and wages by sex,

race, ethnicity, and education have narrowed, and some gaps reached historical lows in 2023. However, despite this narrowing, significant disparities in absolute levels across groups remain. (See the box “Employment and Earnings across Demographic Groups” in Part 1.)

Housing sector. The rise in mortgage rates over the past two years has reduced housing demand, resulting in a steep drop in housing activity in 2022 and a marked slowing in house price growth from its historically high pace. Offsetting factors boosting housing demand, such as the robust job market and the increased prevalence of remote work, have prevented significant price declines. High mortgage rates have also discouraged some potential sellers with low rates on their current mortgages from moving, which has kept the existing home market unusually thin. The shortage of available existing homes has pushed some remaining homebuyers toward new homes and supported a modest rebound in construction of single-family homes later in 2023. In contrast, multifamily starts rose to historically high levels in 2022 but have more recently fallen back because of builders’ concerns about the effect of the significant amount of new multifamily supply on rents and property prices. (See the box “Recent Housing Market Developments” in Part 1.)

Federal Reserve’s balance sheet and money markets. The size of the Federal Reserve’s balance sheet has decreased since June as the FOMC continued to reduce its securities holdings. Despite ongoing balance sheet runoff, reserve balances—the largest liability on the Federal Reserve’s balance sheet—edged up as declines in the usage of the overnight reverse repurchase agreement facility—another Federal Reserve liability—more than matched the decline in assets. (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

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>.

interest rate in response to the behavior of a small number of economic variables, can provide useful guidance to policymakers. With inflation easing and supply and demand conditions in labor markets coming into better balance, the policy rate prescriptions of most

simple monetary policy rules have decreased recently and now call for levels of the federal funds rate that are close to the current target range for 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

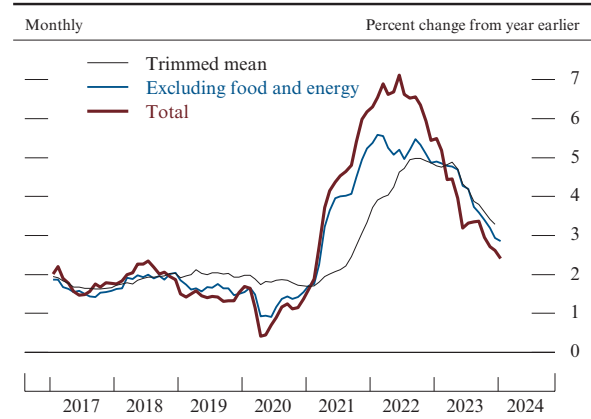
Inflation has eased but remains elevated

After surging in 2021 and 2022, inflation slowed notably last year. The price index for personal consumption expenditures (PCE) rose 2.4 percent over the 12 months ending in January, down from a peak of 7.1 percent in 2022, though still above the Federal Open Market Committee's (FOMC) longer-run objective of 2 percent (figure 1). The core PCE price index—which excludes volatile food and energy prices—rose 2.8 percent over the 12 months ending in January. More recently, core PCE prices increased at an annual rate of 2.5 percent over the six months ending in January, though measuring inflation over relatively short periods risks exaggerating the influence of idiosyncratic or temporary factors (figure 2). The trimmed mean measure of PCE prices constructed by the Federal Reserve Bank of Dallas—which provides an alternative approach to reducing the influence of idiosyncratic price movements—increased 3.3 percent over the 12 months ending in December, somewhat higher than the core index (figure 1).

Consumer energy prices have declined, while food price inflation has slowed markedly

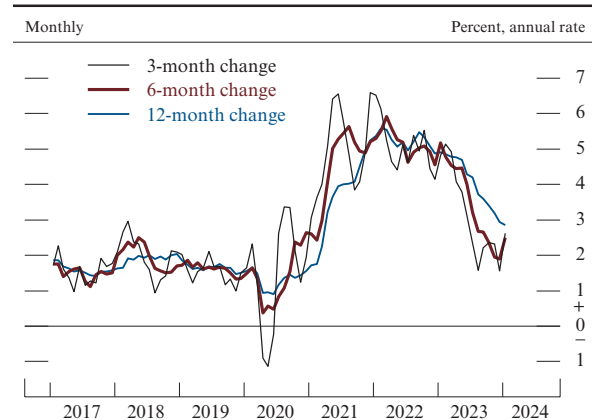
After hovering around \$80 per barrel in the first half of last year, oil prices rose notably in late summer, albeit to levels still well below those seen in 2022, but have since declined, on net, to around \$83 per barrel (figure 3). Gasoline prices have followed a similar pattern. The moderation in oil prices last fall reflects weak economic activity abroad and increases in U.S. and other non-OPEC (Organization of the Petroleum Exporting Countries) oil production. Since late last year, geopolitical tensions in the Middle East and rerouting of shipping away from the Red Sea have placed some upward pressure on oil

1. Personal consumption expenditures price indexes



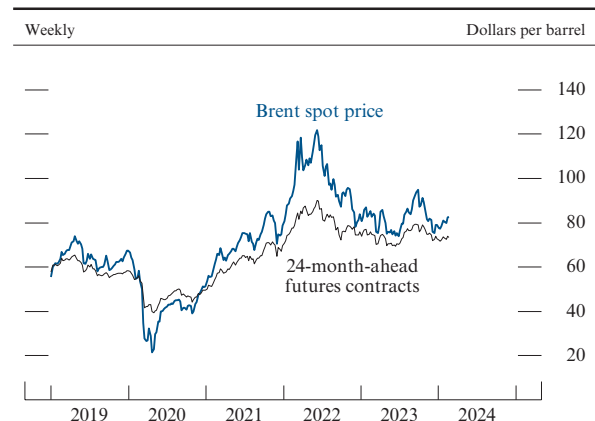
NOTE: Trimmed mean data extend through December 2023.
SOURCE: For trimmed mean, Federal Reserve Bank of Dallas; for all else, Bureau of Economic Analysis; all via Haver Analytics.

2. Core personal consumption expenditure price index



SOURCE: Bureau of Economic Analysis, personal consumption expenditures via Haver Analytics.

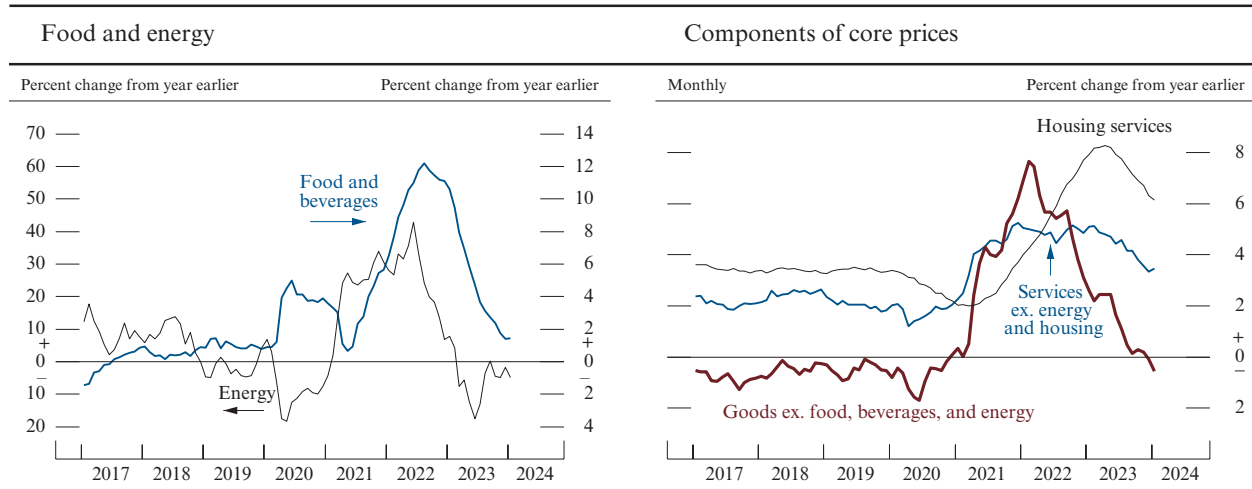
3. Spot and futures prices for crude oil



NOTE: The data are weekly averages of daily data and extend through February 23, 2024.

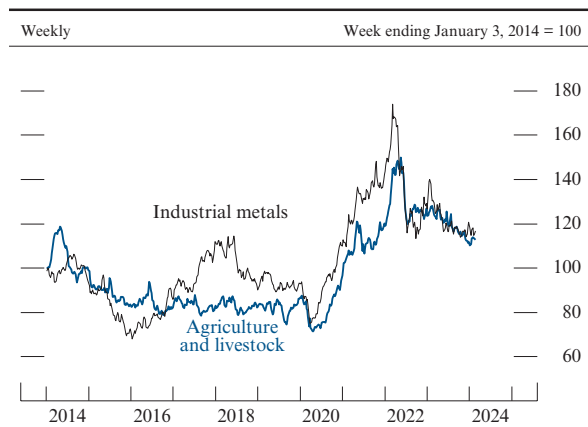
SOURCE: ICE Brent Futures via Bloomberg.

4. Subcomponents of personal consumption expenditures price indexes



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

5. Spot prices for commodities



NOTE: The data are weekly averages of daily data and extend through February 23, 2024.
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.

prices. Continuing geopolitical tensions pose an upside risk to energy prices. Natural gas prices remain well below the elevated 2022 levels due to strong production and high inventory levels. All told, consumer energy prices fell 4.9 percent in the 12 months ending in January (figure 4, left panel).

Food price inflation slowed markedly last year, as prices of agricultural commodities and livestock fell (figure 5). This moderation brought the 12-month change in food prices down to 1.4 percent in January, a substantial slowing from the 11 percent increase recorded over 2022 (figure 4, left panel).

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. Reflecting the sharp increases seen in 2021 and 2022, these price indexes are about 25 percent higher than before the pandemic.

Core goods prices have been declining as supply bottlenecks ease and import price inflation falls . . .

Outside of food and energy prices, there has been significant deceleration across the main spending categories, though disinflation

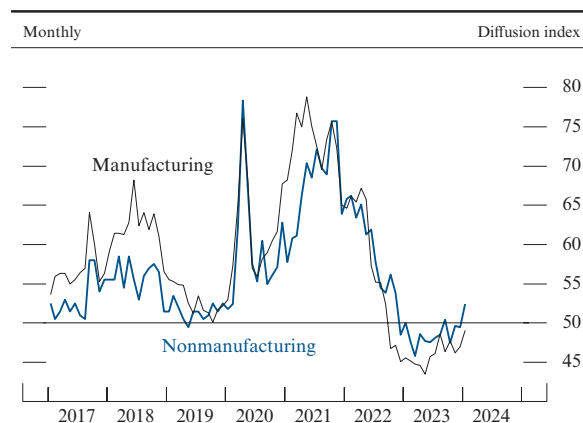
has been more pronounced in some than in others (figure 4, right panel). Core goods prices fell 0.6 percent in the 12 months ending in January, and the deceleration was broad based, as the supply chain issues and other capacity constraints that had earlier boosted inflation so much eased substantially. For example, suppliers' delivery times had lengthened considerably during the pandemic but have been getting shorter over the past year (figure 6). Core goods inflation was also held down last year by a net decline in nonfuel import prices, which, in turn, largely reflected falling commodity prices (figure 7).

... while core services price inflation has been slowing but remains elevated

Price inflation for both housing services and core services other than housing slowed over the past year, though it remains elevated. Increases in housing services prices began to moderate, coming in at 6.1 percent in the 12 months ending in January, down from a peak of more than 8 percent (figure 4, right panel). This slowing is consistent with the notably smaller increases in market rents on new housing leases to new tenants seen since late 2022 (figure 8). 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. The softening in market rents therefore points to a continued deceleration in housing services prices over the year ahead.

Prices for nonhousing core services—a broad group that includes services such as travel and dining, financial services, and car repair—rose 3.5 percent in the 12 months ending in January, down from their recent peak of 5.2 percent (figure 4, right panel). As labor costs are a significant input in these service sectors, the ongoing softening of labor demand and improvements in labor supply should contribute to a further slowing in core services price inflation as labor cost growth moderates.

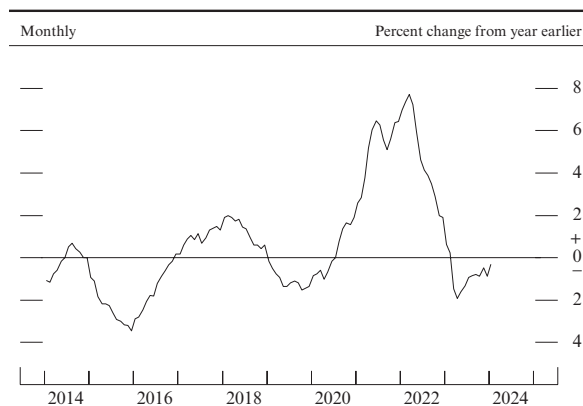
6. Suppliers' delivery times



NOTE: Values greater than 50 indicate that more respondents reported longer delivery times relative to a month earlier than reported shorter delivery times.

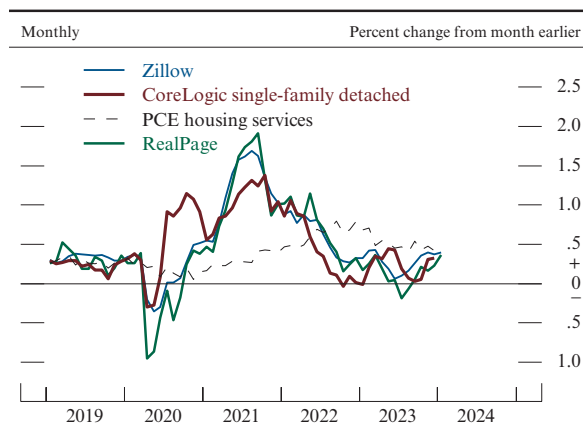
SOURCE: Institute for Supply Management, *Report on Business*, via Haver Analytics.

7. Nonfuel import price index



SOURCE: Bureau of Labor Statistics via Haver Analytics.

8. Housing rents

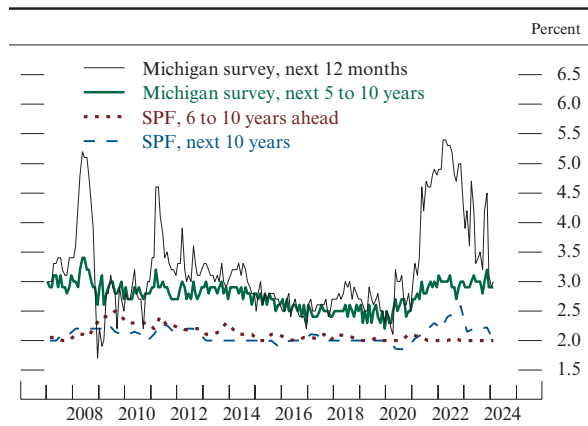


NOTE: CoreLogic data extend through December 2023. Zillow, CoreLogic, and RealPage measure market-rate rents—that is, rents for a new lease by a new tenant.

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 stable, while shorter-term expectations have fallen back

9. Measures of inflation expectations

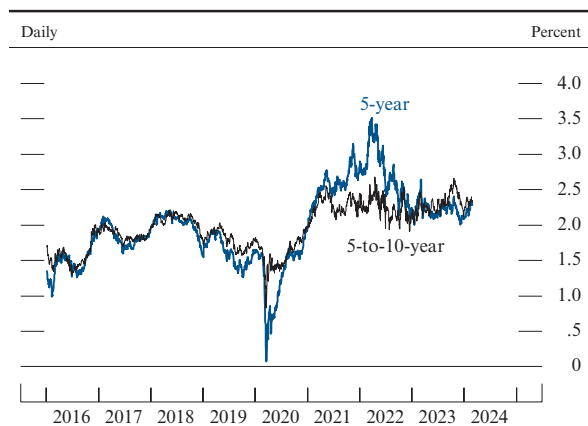


NOTE: The Survey of Professional Forecasters (SPF) data are quarterly and extend through 2024:Q1. The data for the Michigan survey are monthly and extend through February 2024; the February data are preliminary.

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

The generally held view among economists and policy analysts is that inflation expectations influence actual inflation by affecting wage- and price-setting decisions. Survey-based measures of expected inflation over a longer horizon have generally been moving sideways over the past year, within the range seen during the decade before the pandemic, and they appear broadly consistent with the FOMC’s longer-run 2 percent inflation objective. This development is seen for surveys of households, such as the University of Michigan Surveys of Consumers, and for surveys of professional forecasters (figure 9). For example, the median forecaster in the Survey of Professional Forecasters, conducted by the Federal Reserve Bank of Philadelphia, continued to expect PCE price inflation to average 2 percent over the five years beginning five years from now.

10. 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.

Moreover, inflation expectations over a shorter horizon—which tend to follow observed inflation more closely—have been reversing their earlier run-ups. In the Michigan survey, the median value for inflation expectations over the next year was 3.0 percent in February, well below the peak rate of 5.4 percent observed in spring 2022. 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 returned to the range of values seen before the pandemic.

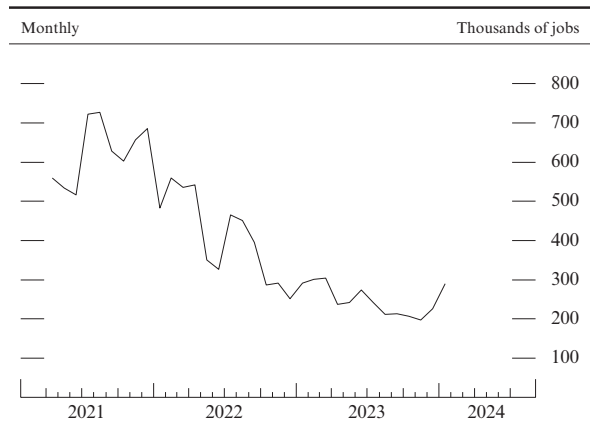
Market-based measures of longer-term inflation compensation, which are based on financial instruments linked to inflation such as Treasury Inflation-Protected Securities, are also broadly in line with readings seen in the years before the pandemic and consistent with inflation returning to 2 percent. These measures have been little changed, on net, since last summer (figure 10).

The labor market remains strong

Payroll employment gains have been robust, averaging 239,000 since June of last year. The pace of job gains has nevertheless been softening, having averaged more than 375,000 per month in 2022 and about 290,000 in the first half of 2023 (figure 11). This slowing has come primarily from the professional and business services, manufacturing, and leisure and hospitality sectors, which tend to be cyclically sensitive. In contrast, employment growth has remained strong in the health-care and social assistance sector and at state and local governments, which tend to be less cyclically sensitive and are still recovering from pandemic-era staffing shortages.

The unemployment rate edged up, on net, since the middle of last year, but at 3.7 percent in January, it is only slightly above its pre-pandemic level and remains very low by historical standards (figure 12). Indeed, unemployment rates among most age, educational attainment, sex, and ethnic and racial groups are near their respective historical lows (figure 13). (The box “Employment and Earnings across Demographic Groups” provides further details.)

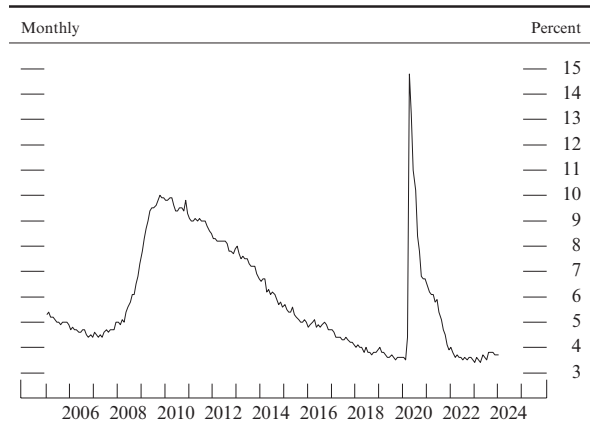
11. Nonfarm payroll employment



NOTE: The data shown are a 3-month moving average of the change in nonfarm payroll employment.

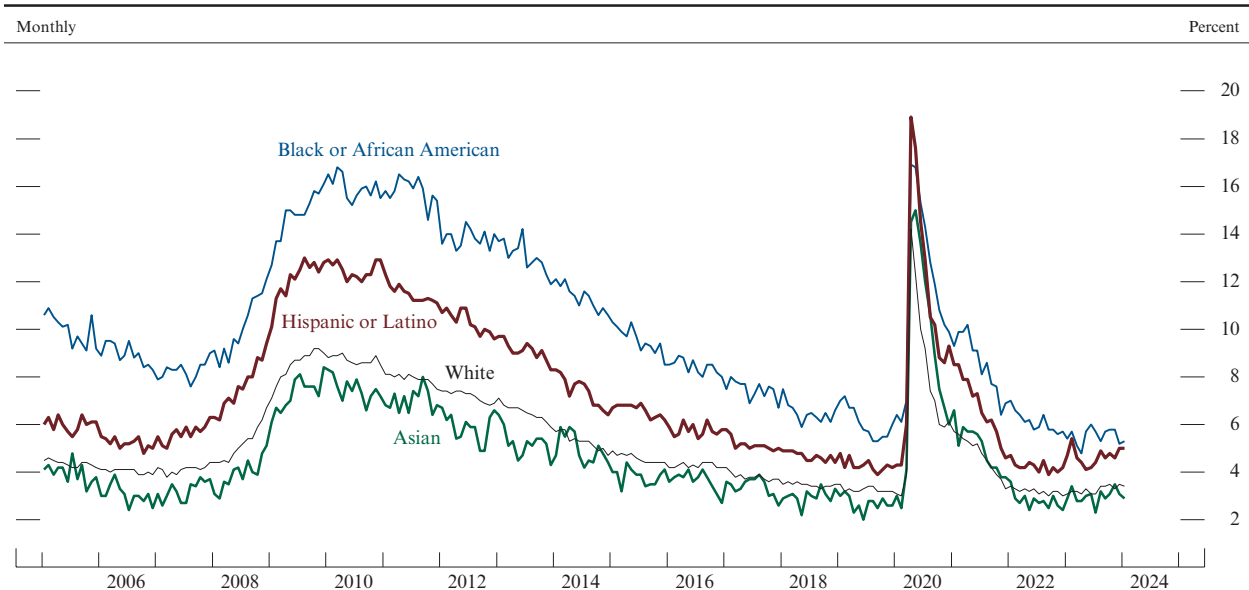
SOURCE: Bureau of Labor Statistics via Haver Analytics.

12. Civilian unemployment rate



SOURCE: Bureau of Labor Statistics via Haver Analytics.

13. 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.

Employment and Earnings across Demographic Groups

Economic expansions have tended to narrow long-standing disparities in employment and earnings across demographic groups, which can help make up for disproportionate losses experienced during downturns. These benefits have been especially pronounced during the current expansion, which has been characterized by an exceptionally tight labor market and robust demand for workers over the past two years.

Among prime-age individuals (ages 25 to 54), employment for Black or African American workers, which declined more relative to white and Asian workers in early 2020, reached a historical peak in 2023 (figure A, left panel). As a result, the gap in the employment-to-population (EPOP) ratio between prime-age Black and white workers fell to its lowest point in almost 50 years.¹ Hispanic or Latino workers experienced especially large employment losses in 2020, due in part to greater exposure to the industries most affected by the pandemic.² By early 2022, however, this group's EPOP ratio gap relative to prime-age white workers had recovered to its 2019 average and has remained near this historically low level for the past two years. The EPOP ratio for prime-age Asian

workers was also historically high in early 2023, although it has since moved down closer to its 2019 level.³

Similarly, the EPOP ratio for prime-age women increased steadily over the past two years and reached a record high in 2023 (figure A, right panel). As a result, the EPOP ratio gap between prime-age men and women fell to a record low. The recent increase in female employment is mostly attributable to rising labor force participation, which had also been increasing briskly before the pandemic, bolstered by a growing share of women with a college degree.⁴ Other factors, including tight labor market conditions and greater availability of remote-work options, may have also contributed to rising prime-age female labor force participation.⁵

(continued)

1. In fact, for the population aged 16 or older, the EPOP ratio was the same for Black and white individuals in January 2024 (not shown). This equivalence, however, partly reflects the fact that these groups have different age distributions, with whites older, on average, and thus more likely to be retired.

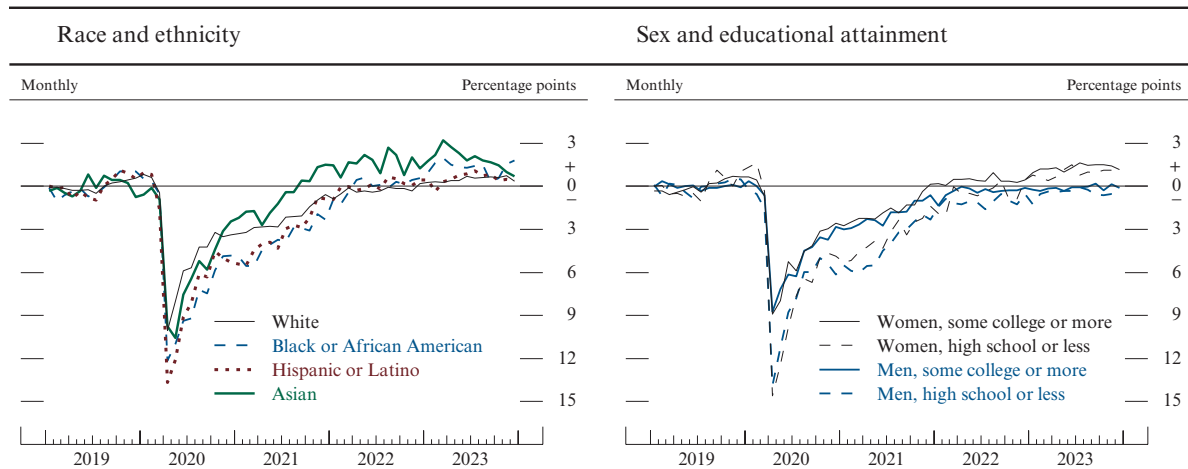
2. On the relationship between occupation, industry, and the differential effect of the COVID-19 pandemic across demographic groups, see Guido Matias Cortes and Eliza Forsythe (2023), "Heterogeneous Labor Market Impacts of the COVID-19 Pandemic," *ILR Review*, vol. 76 (January), pp. 30–55.

3. As monthly series have greater sampling variability for smaller groups, we do not plot EPOP ratio estimates for American Indians or Alaska Natives.

4. For a discussion of the contribution of educational attainment to prime-age female labor force participation before the pandemic, see Didem Tüzemen and Thao Tran (2019), "The Uneven Recovery in Prime-Age Labor Force Participation," Federal Reserve Bank of Kansas City, *Economic Review*, vol. 104 (Third Quarter), pp. 21–41, <https://www.kansascityfed.org/Economic%20Review/documents/652/2019-The%20Uneven%20Recovery%20in%20Prime-Age%20Labor%20Force%20Participation.pdf>.

5. For a discussion on access to remote work and participation rates, see Maria D. Tito (2024), "Does the Ability to Work Remotely Alter Labor Force Attachment? An Analysis of Female Labor Force Attachment," FEDS Notes (Washington: Board of Governors of the Federal Reserve System, January 19), <https://doi.org/10.17016/2380-7172.3433>.

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



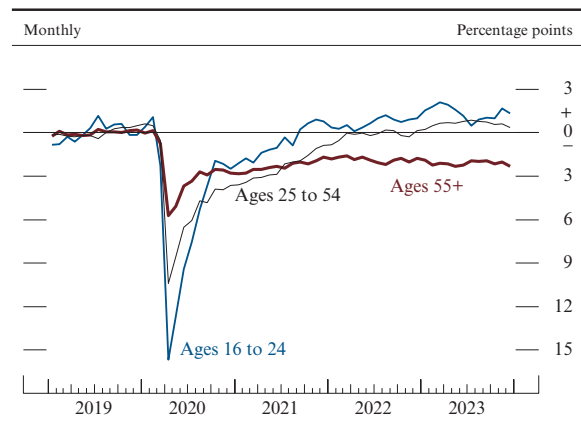
NOTE: The data extend through December 2023. Prime age is 25 to 54. All series are seasonally adjusted by the Federal Reserve Board staff. SOURCE: Bureau of Labor Statistics; U.S. Census Bureau, Current Population Survey; Federal Reserve Board staff calculations.

Robust labor demand over the past two years has also reversed pandemic-induced employment losses across education groups. For both prime-age men and women, the EPOP ratio fell significantly more for workers with a high school diploma or less compared with those with at least some college education, largely reflecting industry exposure to pandemic-related closures or some differences in the ability to work remotely across jobs. Notably, the EPOP ratio declined similarly for men and women with the same education level, a result that contrasts with those in previous recessions, in which male EPOP losses have historically outpaced female losses.⁶ The unusually large effect on women during the pandemic also reflects the industry composition of job losses, as well as caregiving needs.⁷

While employment disparities across many demographic groups are now within historically narrow ranges, substantial gender, racial, and ethnic gaps remain, underscoring long-standing structural factors. Currently, prime-age women are employed at a rate 11 percentage points less than men, while prime-age Black and Hispanic workers are employed at a rate 3 to 4 percentage points less than white workers. Further, the differential effect of the pandemic on the employment of older workers has proven highly persistent. The EPOP ratio for workers aged 55 or older remains approximately 2 percentage points below its pre-pandemic level and has changed little since late 2021 (figure B). This shortfall is wholly attributable to decreases in labor force participation stemming from increased retirements concentrated among workers aged 60 or older.⁸

In addition to narrowing many employment gaps, historically tight labor market conditions over the past

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



NOTE: The data extend through December 2023. Data before January 2023 are estimated by Federal Reserve Board staff in order to eliminate discontinuities in the published history.

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

two years have also led to strong nominal wage growth, especially for groups at the lower end of the earnings distribution. As shown in the top-left panel of figure C, real wage growth—as measured by the Federal Reserve Bank of Atlanta’s Wage Growth Tracker and deflated by the personal consumption expenditures price index—has been consistently stronger for workers in lower wage quartiles.⁹

Stronger wage growth at the bottom of the income distribution is reflected in the experiences of different education and demographic groups. In the first two years of the recovery, real wage growth was stronger for workers with a high school diploma or less relative to workers with a bachelor’s degree or more (figure C, top-right panel) and, in the past two years, has also been stronger for nonwhite workers relative to white workers (figure C, bottom-left panel). Wages for men and women, by contrast, have largely grown in tandem (figure C, bottom-right panel).¹⁰ In addition to the influence of a tight labor market, differences in wage

(continued on next page)

6. See Claudia Goldin (2022), “Understanding the Economic Impact of COVID-19 on Women,” *Brookings Papers on Economic Activity*, Spring, pp. 65–110, https://www.brookings.edu/wp-content/uploads/2022/03/16265-BPEA-Sp22_Goldin_WEB-Appendix.pdf; and Stefania Albanesi and Jiyeon Kim (2021), “Effects of the COVID-19 Recession on the US Labor Market: Occupation, Family, and Gender,” *Journal of Economic Perspectives*, vol. 35 (Summer), pp. 3–24.

7. On the role of caregiving, see Joshua Montes, Christopher Smith, and Isabel Leigh (2021), “Caregiving for Children and Parental Labor Force Participation during the Pandemic,” FEDS Notes (Washington: Board of Governors of the Federal Reserve System, November 5), <https://www.federalreserve.gov/econres/notes/feds-notes/caregiving-for-children-and-parental-labor-force-participation-during-the-pandemic-20211105.html>.

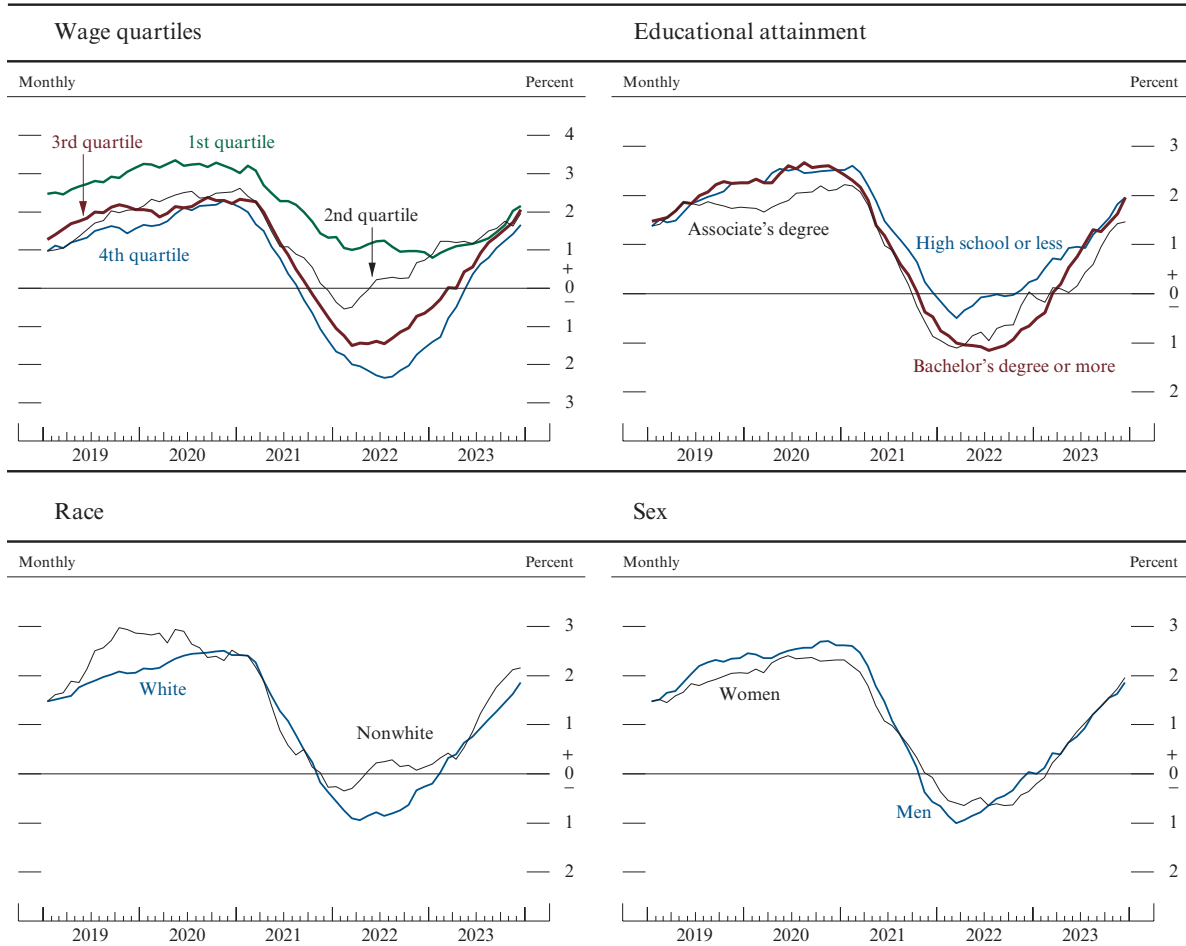
8. For an analysis on the increase in retirements following the pandemic, see Joshua Montes, Christopher Smith, and Juliana Dajon (2022), “‘The Great Retirement Boom’: The Pandemic-Era Surge in Retirements and Implications for Future Labor Force Participation,” Finance and Economics Discussion Series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

9. 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 changes. Thus, by construction, these series lag the actual real wage changes.

10. The measure of real earnings growth shown in the figure uses the same price index for all groups, but inflation experiences can differ across demographic groups because of differences in what they purchase or where they shop. See Jacob Orchard (2021), “Cyclical Demand Shifts and Cost of Living Inequality,” working paper, February (revised September 2022).

Employment and Earnings *(continued)*

C. Median real wage growth, by group



NOTE: The data extend through December 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 top-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.

growth across groups partially reflect factors specific to the post-pandemic recovery, such as the sectoral composition of labor demand and supply. Wages, for instance, grew faster than average in the leisure and hospitality industry, a relatively low-wage sector that suffered disproportionate employment losses during the pandemic, followed by a surge in vacancies that employers struggled to fill as the economy reopened.

Over the past year, real wages have been rising for all groups shown here, and differences in real wage

growth across groups have narrowed considerably. While the labor market is still tight by historical standards, factors disproportionately boosting wage growth for the lowest earners have largely faded. In 2023, nominal wage growth slowed for workers with below-median earnings but stepped up for workers above the median. Even so, the gaps in relative wages between workers in the first three quartiles and those in the highest quartile continue to close, albeit at a slower pace.

Labor demand has been gradually cooling . . .

Demand for labor continued to cool last year but remains robust. The Job Openings and Labor Turnover Survey (JOLTS) indicated that there were nearly 9 million job openings at the end of 2023—down about 3 million from the all-time high recorded in March 2022 but still around 2 million above pre-pandemic levels. An alternative measure of job vacancies constructed by the Federal Reserve Board staff using job postings data from the large online job board Indeed also shows that vacancies continued to move gradually lower through mid-February but remained above pre-pandemic levels. In addition, measures of layoffs, such as initial claims for unemployment insurance and the rate of layoffs and discharges in the JOLTS, have remained very low by historical standards.

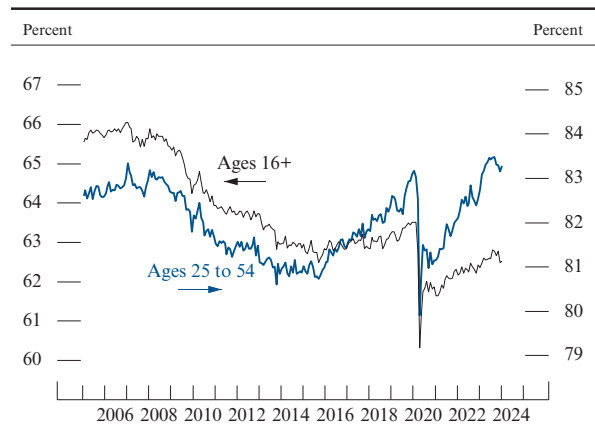
. . . and labor supply has increased further . . .

Meanwhile, the supply of labor has continued to increase on net. The labor force participation rate, which measures the share of people either working or actively seeking work, continued to trend higher for most of last year but has softened in recent months (figure 14). Importantly, labor force participation for prime-age workers increased notably through last September and, although it has edged down more recently, remains above its pre-pandemic level.

Labor supply was also boosted last year by relatively strong population growth. The Census Bureau estimates that the resident population increased 1.7 million (0.5 percent) in 2023, with almost 70 percent of that increase coming from immigration.² Last

2. A recent report from the Congressional Budget Office estimates that immigration has been considerably higher than in the Census Bureau’s estimates in recent years; see Congressional Budget Office (2024), *The Demographic Outlook: 2024 to 2054* (Washington: CBO, January), <https://www.cbo.gov/publication/59697>. The labor force estimates published by the Bureau of Labor Statistics are based on the civilian noninstitutionalized population aged 16 or older, which constitutes about 80 percent of the resident population.

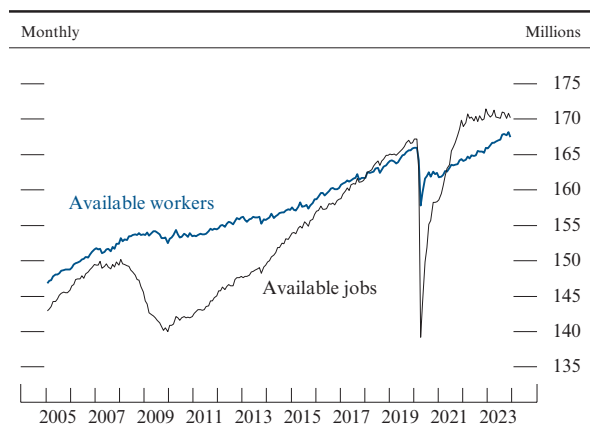
14. Labor force participation rate, by age



NOTE: The labor force participation rate is a percentage of the relevant population. Data are monthly, and values before January 2023 are estimated by Federal Reserve Board staff in order to eliminate discontinuities in the published history.

SOURCE: Bureau of Labor Statistics via Haver Analytics; U.S. Census Bureau; Federal Reserve Board staff calculations.

15. Available jobs versus available workers



NOTE: The data extend through December 2023. Available jobs are employment plus job openings as of the end of the previous month. Available workers are the labor force. Data for employment and labor force before January 2023 are estimated by Federal Reserve Board staff in order to eliminate discontinuities in the published history.

SOURCE: Bureau of Labor Statistics via Haver Analytics; U.S. Census Bureau; Federal Reserve Board staff calculations.

year's rate of population growth was slightly faster than in 2022 and about twice as fast as in 2020 and 2021, when growth was held down by COVID-19-related increases in mortality and restrictions on immigration. Although population growth has largely returned to its pace from the years preceding the pandemic, it remains well below its average from 1990 to 2015.

... but the labor market remains relatively tight

Even with easing labor demand and rising labor supply, the labor market remains relatively tight. Some indicators suggest that the labor market remains tighter than before the pandemic, while others have returned to their 2019 ranges, when the labor market was also relatively tight. The number of total available jobs (measured by employed workers plus job openings) still exceeds the number of available workers (measured by the labor force). This jobs–workers gap was around 2.8 million in December, down markedly from its peak of 6.0 million recorded in March 2022 but still above its 2019 average of 1.1 million (figure 15).³ In contrast, the percentage of workers quitting their jobs each month, an indicator of the availability of attractive job prospects, was 2.2 percent in December, close to its 2019 average. Surveys indicate that households' and small businesses' perceptions of labor market tightness have also come down from their recent peaks. In addition, business contacts in nearly all Federal Reserve Districts cited signs of a cooling labor market, such as larger applicant pools and lower turnover rates; however, some employers continued to report difficulty finding workers, particularly employers seeking specialized skills.⁴

3. The ratio of job openings to unemployment shows that there were 1.4 job openings per unemployed person in December 2023. For comparison, this ratio averaged 1.2 in 2019 and 0.6 over the 10-year period from 2010 to 2019.

4. See the January 2024 Beige Book, available on the Board's website at <https://www.federalreserve.gov/monetarypolicy/publications/beige-book-default.htm>.

Wage growth has slowed but remains elevated

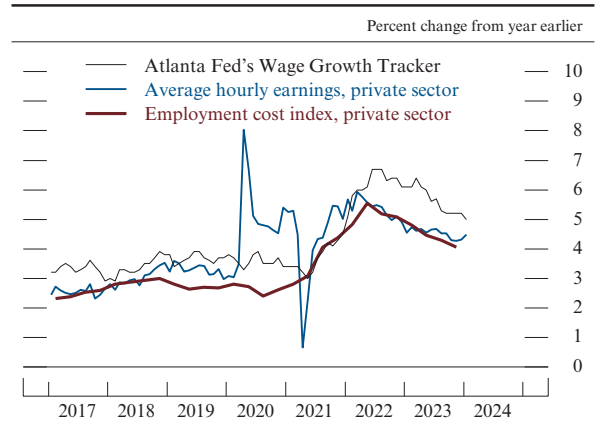
Consistent with the easing in labor market tightness, nominal wage growth slowed in 2023 but remains elevated (figure 16). Total hourly compensation as measured by the employment cost index increased 4.2 percent over the 12 months ending in December, a noticeable slowing from the 5.1 percent increase in 2022. Other aggregate measures, such as average hourly earnings (a less comprehensive measure of compensation) and 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, have slowed as well. With PCE prices having risen 2.6 percent in 2023, these measures suggest that most workers saw increases in the purchasing power of their wages over the past year.

Labor productivity strengthened last 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. Labor productivity in the business sector has been extremely variable since the pandemic began, increasing sharply in 2020 and then declining, on average, over 2021 and 2022 (figure 17). Productivity is reported to have risen a robust 2.7 percent last year. When averaged over the pandemic period, output per hour rose at a moderate average annual rate of 1½ percent, in line with the average rate of growth observed during the business cycle from the fourth quarter of 2007 to the fourth quarter of 2019.

As always, the pace of future productivity growth remains highly uncertain. It is possible that productivity growth could remain at around this same moderate pace. However, it is also possible that the rapid adoption of new technologies like artificial intelligence and robotics—as well as the high rate of new business formation that the pandemic brought about—could boost productivity growth above that pace in coming years.

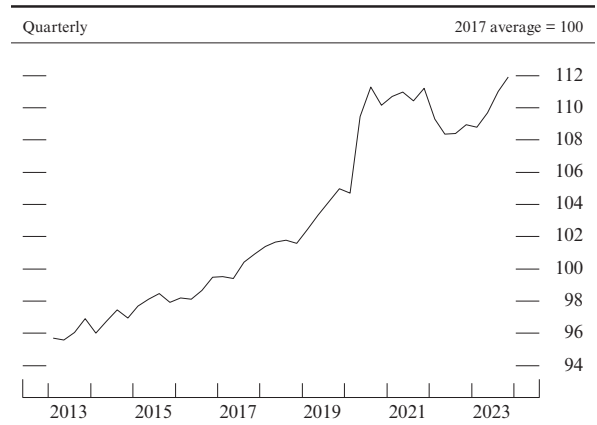
16. Measures of change in hourly compensation



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.

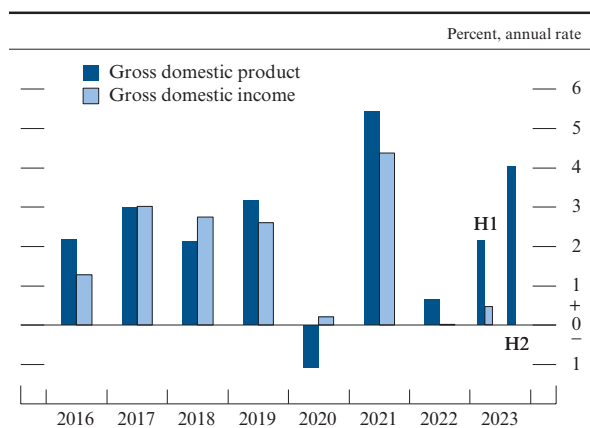
SOURCE: Bureau of Labor Statistics; Federal Reserve Bank of Atlanta, Wage Growth Tracker; all via Haver Analytics.

17. U.S. labor productivity



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

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



NOTE: The data for gross domestic income extend through 2023:H1. The key identifies bars in order from left to right.

SOURCE: Bureau of Economic Analysis via Haver Analytics.

Gross domestic product rose at a solid pace last year

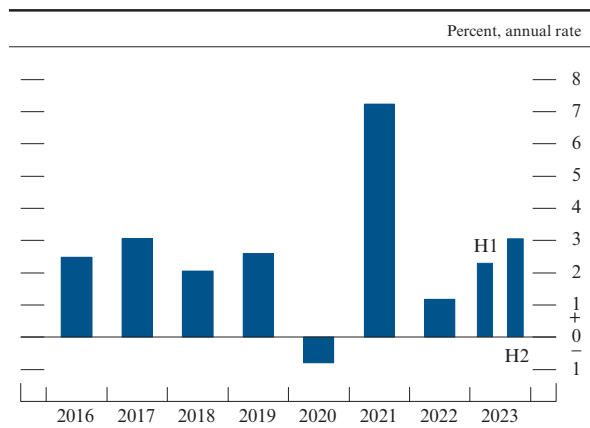
Real gross domestic product (GDP) is reported to have increased at an annual rate of 4.0 percent in the second half of 2023, up from 2.2 percent in the first half. For 2023 as a whole, GDP increased 3.1 percent, notably faster than in 2022 despite restrictive financial conditions, including elevated longer-term interest rates (figure 18).⁵ Among the components of GDP, consumer spending rose solidly in the second half of last year, and residential investment started to turn back up following its earlier sharp declines, but growth of business investment slowed.

In contrast to GDP, manufacturing output was little changed, on net, last year, a downshift following two years of robust post-pandemic gains. Motor vehicle production continued to rebound from supply chain disruptions in 2021 and 2022, although last year's production was held down by strikes at several major automakers. Outside of motor vehicles, industrial production generally moved sideways last year, but it was down from its post-pandemic peak in early 2022, as inventories normalized and new orders fell back.

Consumer spending growth was resilient even as household finances deteriorated

Consumer spending adjusted for inflation grew at a solid rate of 3.0 percent in the second half of 2023 and 2.7 percent for last year as a whole (figure 19). Consumers' resilience in the face

19. Change in real personal consumption expenditures



SOURCE: Bureau of Economic Analysis via Haver Analytics.

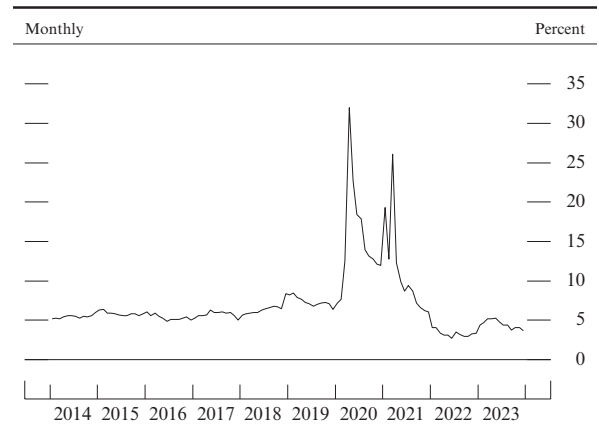
5. Real gross domestic income (GDI) has been notably weaker than GDP in recent quarters; both series measure the same economic concept, and any difference between the two figures reflects measurement error. GDI reportedly increased at a 0.8 percent pace in the first three quarters of last year after having been unchanged over the four quarters of 2022—well below the corresponding figures for GDP. As a result, productivity calculated from the income side of the national accounts would also be considerably weaker than the published figures over the past couple of years.

of tight financial conditions was supported by the strong labor market and rising real incomes. Indeed, after declining, on average, in 2021 and 2022, real disposable personal income increased robustly last year. However, last year’s spending was also accompanied by households drawing down their liquid assets, such as checking accounts, and by relying more on credit. Indeed, the saving rate was 3.9 percent in the fourth quarter of 2023, well below pre-pandemic levels (figure 20). In addition, although household wealth relative to income remains high in the aggregate, it has declined, on net, since the end of 2021 and so is likely providing less support to consumer spending. Consumer spending since the pandemic has been more robust than measures of consumer sentiment would suggest. Although sentiment in the Michigan survey has improved markedly in recent months, it remains much further below its pre-pandemic level than does a similar measure from the Conference Board, which puts more weight on labor market conditions (figure 21).

Consumer financing conditions tightened last year

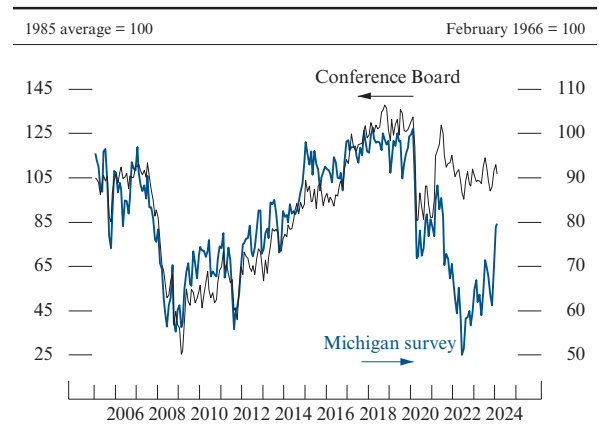
Credit remains available for most consumers, though interest rates on both credit cards and auto loans remain higher than the levels observed in 2018 at the peak of the previous monetary policy tightening cycle. Indeed, interest rates on credit cards have continued to increase since the first half of last year. In addition, banks reported continued tightening of lending standards across consumer credit products, in part reflecting lenders’ concerns about further deterioration in credit performance and higher funding costs. Delinquency rates for credit cards rose further over the second half of 2023, while those for auto loans flattened out; both rates are notably above levels observed just before the pandemic. Reflecting these and other factors, consumer credit expanded moderately during the second half of last year, driven by robust growth in credit card balances and modest growth in

20. Personal saving rate



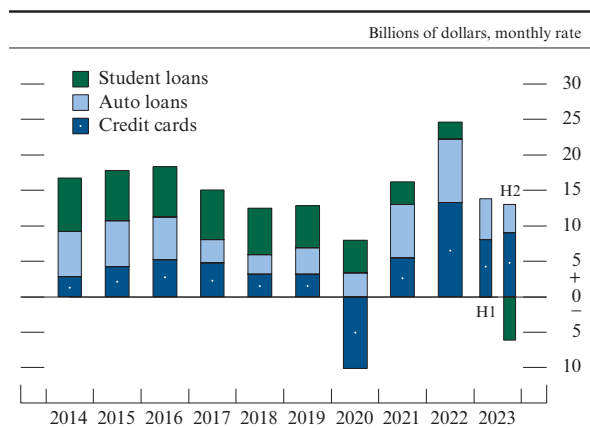
NOTE: The data extend through December 2023.
SOURCE: Bureau of Economic Analysis via Haver Analytics.

21. Indexes of consumer sentiment



NOTE: The data are monthly and extend through February 2024. The February data for the Michigan survey are preliminary.
SOURCE: University of Michigan Surveys of Consumers; Conference Board.

22. Consumer credit flows



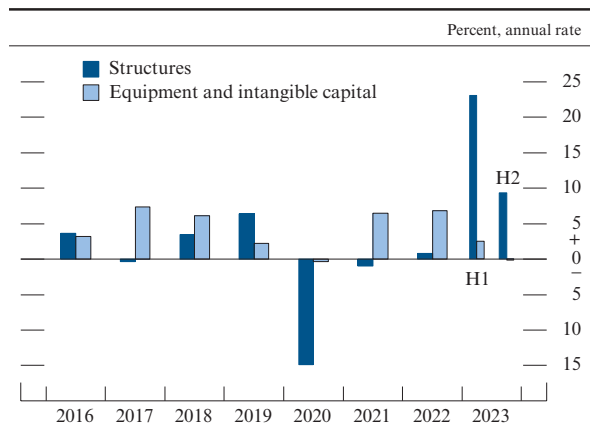
NOTE: Student loan balances were little changed in 2023:H1.
SOURCE: Federal Reserve Board, Statistical Release G.19, “Consumer Credit.”

auto loans (figure 22). In contrast, student loan balances fell in the second half of last year, in large part driven by the cancellation of debt for certain borrowers in income-driven repayment plans.

Residential investment turned around and grew modestly in the second half of 2023

After declining steeply in 2022 on the heels of the substantial rise in mortgage interest rates, residential investment fell a bit further in the first half of 2023 but picked up in the second half of the year. The pickup in housing activity since mid-2023 masked some important differences across components of the market, with sales of existing homes much weaker than sales of new homes and with construction of single-family homes remaining relatively solid while multifamily construction declined. (The box “Recent Housing Market Developments” provides further discussion.)

23. Change in real business fixed investment



NOTE: Business fixed investment is known as “private nonresidential fixed investment” in the national income and product accounts. The key identifies bars in order from left to right. Equipment and intangible capital investment was little changed in 2023:H2.

SOURCE: Bureau of Economic Analysis via Haver Analytics.

Capital spending growth softened amid tighter financial conditions and subdued sentiment

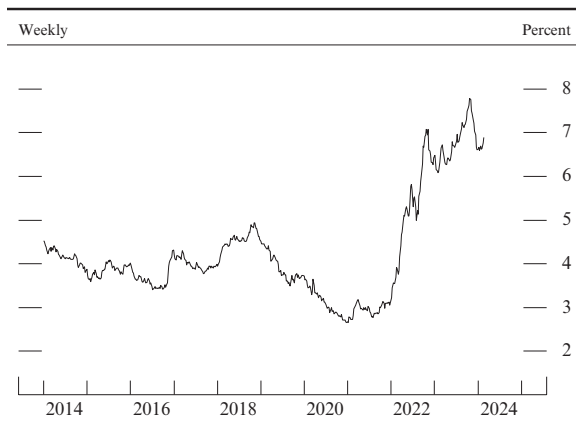
Tighter financial conditions and downbeat business sentiment led to a slowdown in business investment spending growth in the second half of 2023 (figure 23). Equipment investment spending declined in the second half of the year, while investment in intellectual property products—which include software and research and development—continued to decelerate from its solid pace of growth over the previous few years. Investment in nonresidential structures, which had surged in early 2023 because of a boom in manufacturing construction—especially for factories that produce semiconductors or electric vehicle batteries—also decelerated in the second half of 2023, although the level of structures investment remained much higher than in previous years. Although indicators of business sentiment and profit expectations have improved in recent months, sentiment remains subdued.

Recent Housing Market Developments

The rise in mortgage interest rates since early 2022 has reduced the overall demand for housing and slowed activity in the housing sector appreciably. The change in mortgage rates was unusually large and rapid, with 30-year fixed rates rising from about 3.2 percent in January 2022 to almost 8 percent in October 2023, the highest level since 2000 (figure A). Although mortgage rates have declined somewhat since October, they still averaged around 7 percent in February 2024.

The run-up in mortgage rates through late 2023, combined with a further rise in house prices, resulted in a sharp increase in typical mortgage payments and has reduced housing demand and home sales. The median monthly principal and interest payment on newly originated home-purchase mortgages for owner-occupied properties increased from below \$1,400 in January 2022 to around \$1,800 in early 2023 and has remained around that elevated level (figure B). As a result, home sales (including both new and existing properties) have fallen sharply over the past two years. Home purchases by low-income households have fallen disproportionately more, because mortgage lenders impose maximums on the ratio of a borrower’s debt service payments to the borrower’s income.¹

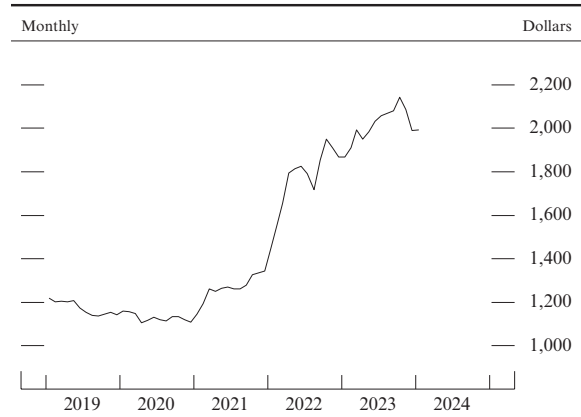
A. Mortgage interest rates



NOTE: The data are contract rates on 30-year, fixed-rate conventional home mortgage commitments and extend through February 22, 2024.
SOURCE: Freddie Mac Primary Mortgage Market Survey via Haver Analytics.

1. See Daniel Ringo (2022), “Declining Affordability and Home Purchase Borrowing by Lower Income Households,” FEDS Notes (Washington: Board of Governors of the Federal Reserve System, July 8), <https://doi.org/10.17016/2380-7172.3160>.

B. Median monthly mortgage payments



NOTE: The data shown are median monthly scheduled principal and interest payments on home purchase mortgages for owner-occupied properties by month of rate lock. The Optimal Blue data are aggregated and anonymized. The data do not contain lender or customer identities or complete rate sheets.
SOURCE: Optimal Blue LLC, Optimal Blue Mortgage Price Data.

However, several other factors have supported underlying demand for housing, somewhat limiting the effect of higher mortgage rates. First, the labor market has remained strong, with historically low unemployment and real wage growth turning positive last year. Second, households may still be gradually adjusting to long-term remote or hybrid work flexibility by seeking additional space. Third, a rising fraction of buyers have been able to purchase homes with cash rather than taking out mortgages. The share of homes purchased with cash was about 15 percent in 2020 and increased to about 25 percent in 2023, with the drop in home sales concentrated in mortgage borrowers.

Housing supply has also faced constraints, due to both short- and long-term factors. In the short term, higher interest rates and tighter underwriting by banks significantly increased builders’ costs of financing, discouraging new construction. In the long term, despite a surge in construction in late 2020 and 2021, it appears that a variety of factors—including zoning and other regulatory hurdles—have prevented construction from keeping up with underlying demand, resulting in a gross housing vacancy rate that is at a historical low.²

(continued on next page)

2. See Joseph Gyourko and Raven Molloy (2015), “Chapter 19—Regulation and Housing Supply,” *Handbook of Regional and Urban Economics*, vol. 5, pp. 1289–337.

Recent Housing Market Developments *(continued)*

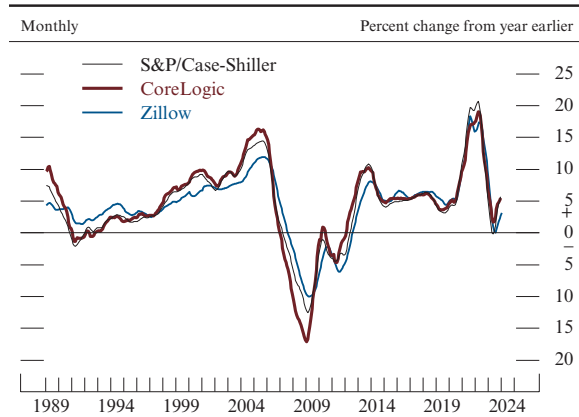
The recent performance of home prices reflects this interplay between housing demand and supply. House price growth slowed rapidly from its historically high pace in response to the jump in interest rates, but it has bounced back recently on a year-over-year basis, leaving house price levels near record highs (figure C).

The interplay between demand and supply has played out quite differently across segments of the housing market. In particular, the contrast between the evolution of new and existing home sales has been notable (figure D). Many households purchased homes or refinanced when fixed mortgage rates were at historically low levels in 2020 and 2021, and, as a result, the majority of outstanding mortgages

have interest rates below 4 percent (figure E). If these homeowners with low mortgage rates want to move to a different home with a new mortgage, their new mortgage payment would be much higher. As a result, many homeowners who might otherwise have moved have instead opted to remain in their current home. The net effect has been an unusually thin market for existing homes, with a dramatic reduction in the number of people both selling and bidding on homes. The decline in the supply of existing homes for sale also makes it difficult for the remaining buyers in the market to find their preferred home and may be driving some to the new home market even as overall sales are depressed. New homebuilders have also been able to offer buyers

(continued)

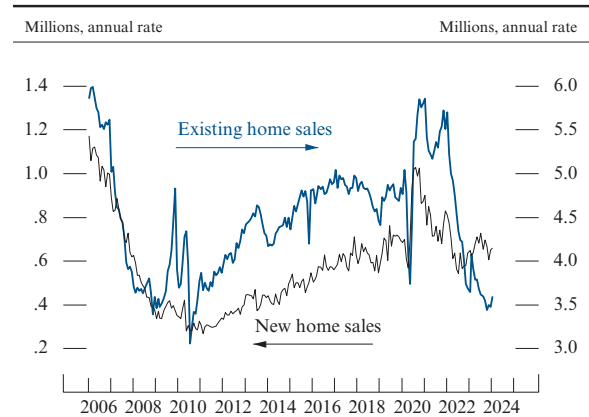
C. Growth rate in house prices



NOTE: CoreLogic and S&P/Case-Shiller data extend through December 2023.

SOURCE: CoreLogic, Inc., 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.)

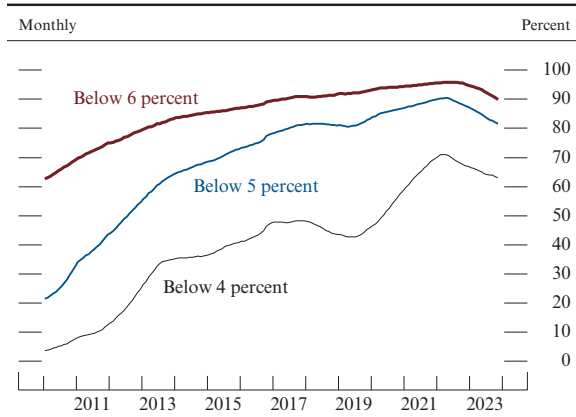
D. New and existing home sales



NOTE: The data are monthly. New and existing home sales include only single-family sales.

SOURCE: For new home sales, U.S. Census Bureau; for existing home sales, National Association of Realtors; all via Haver Analytics.

E. Distribution of interest rates on outstanding mortgages

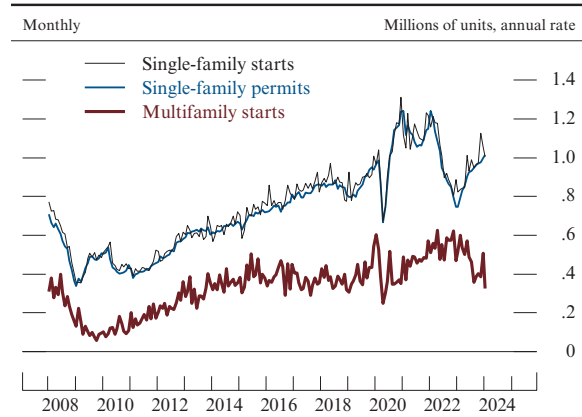


NOTE: The data extend through November 2023. The sample only includes outstanding mortgages current on their payments.
SOURCE: Black Knight McDash.

significant incentives while still maintaining positive profit margins. The relative strength in the new home demand has encouraged builders to increase the rate of new construction after having sharply pulled back in 2022 when rates first started to rise (figure F).

The balance between supply and demand in the multifamily market—which is dominated by rental units—is fundamentally different from that in the single-family market. Initially, as the pandemic eased, market rents surged along with single-family home prices in response to the increased demand for living space, whether owned or rented. These higher rents encouraged a dramatic increase in multifamily starts from what were already quite strong historical levels, averaging 510,000 units per year in 2021 and 2022, compared with an average of 314,000 units per year from 2000 to 2020. Construction of multifamily

F. Private housing starts and permits



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

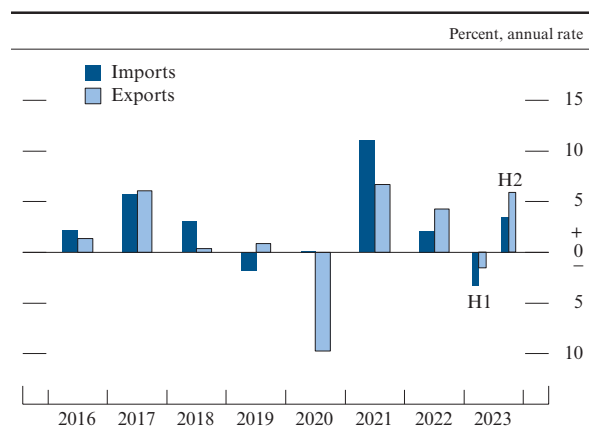
properties remained strong through 2022 even as single-family construction declined sharply. Unlike the cost of buying a home, rental demand is not directly harmed by higher mortgage rates and may even be supported, to some extent, by a shift away from home purchases as rates rise. Multifamily projects also take significantly longer to plan and build than single-family projects and are slower to react to changing economic conditions. Over the past year, we have seen more new properties delivered to the market, which contributed to increases in multifamily vacancy rates and a significant deceleration in market rents. These developments, combined with concerns about the effect of the large amount of new supply still scheduled to be delivered to market over the next year, have started to drive down prices of existing multifamily properties. As a result, the rate of new multifamily construction has come back down over the past year even as single-family construction has picked back up.

Business financing conditions were moderately restrictive overall, but credit remained generally available

Credit remained generally available to most nonfinancial corporations but at elevated interest rates and amid moderately restrictive financial conditions overall. Banks continued to tighten lending standards for all loan types over the second half of last year, and business loan growth at banks continued to slow. In contrast, issuance of corporate bonds remained solid across credit categories, although well below the levels prevailing at the beginning of the tightening cycle.

For small businesses, which are more reliant on bank financing than large businesses, credit conditions tightened further over the second half of last year. Surveys indicate that credit supply for small businesses has tightened further, and interest rates on loans to small businesses moved higher and now stand near the top of the range observed since 2008. Loan default and delinquency rates have also increased and now slightly exceed their pre-pandemic rates.

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



SOURCE: Bureau of Economic Analysis via Haver Analytics.

Trade recovered in the second half of 2023

Real imports remained relatively unchanged for the year as a whole after declining in the first half of last year and then recovering over the second half as domestic demand picked up (figure 24). Despite lackluster foreign growth, exports picked up more strongly than imports over the second half of the year. As such, net exports added about 0.3 percentage point to GDP growth in the fourth quarter of 2023 after being neutral for growth in the previous two quarters. The current account deficit narrowed slightly in the third quarter of 2023 to 2.9 percent of GDP, remaining larger than before the pandemic.

Federal fiscal policy actions were roughly neutral for GDP growth in 2023

Federal purchases grew modestly in 2023, and several recently enacted policies began to boost

investment and consumption. This support to economic activity was about offset by the unwinding of the remaining pandemic-related fiscal policy support. All told, the contribution of discretionary changes in federal fiscal policy to real GDP growth was roughly neutral last year.

The budget deficit and federal debt remain elevated

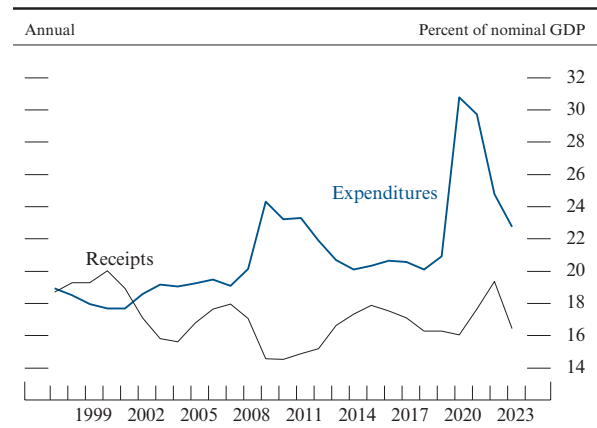
After surging to 15 percent of GDP in fiscal year 2020, the budget deficit declined through 2022 as the imprint of the pandemic faded (figure 25). The budget deficit edged up to 6.3 percent of GDP in fiscal 2023 as tax receipts declined from their elevated level in 2022 and net interest outlays increased.⁶

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 26). After falling slightly through 2022, the debt-to-GDP ratio edged up in 2023, as rising interest rates contributed to higher net interest outlays. The Congressional Budget Office projects that further increases in interest costs, along with positive primary deficits—that is, total deficits less interest payments—will produce a steady rise in the debt-to-GDP ratio in the years to come.

Most state and local government budget positions remained strong . . .

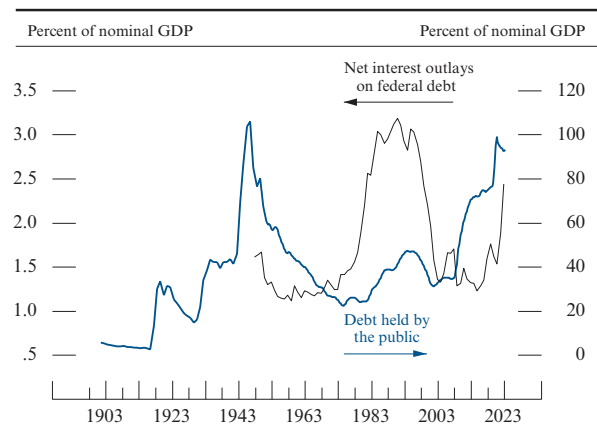
Federal policymakers provided a historically high level of fiscal support to state and local governments during the pandemic; this aid, together with robust state tax collections in 2021 and 2022, left the sector in a strong

25. Federal receipts and expenditures



NOTE: The receipts and expenditures data are on a unified-budget basis and are for fiscal years (October through September); gross domestic product (GDP) data are on a 4-quarter basis ending in Q3.
SOURCE: Department of the Treasury, Financial Management Service; Office of Management and Budget and Bureau of Economic Analysis via Haver Analytics.

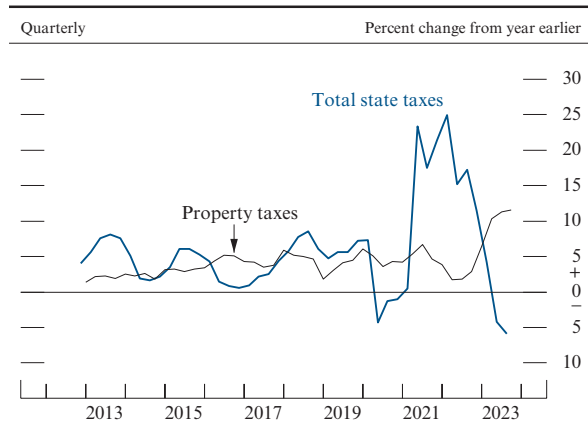
26. Federal government debt and net interest outlays



NOTE: The data for net interest outlays are annual, begin in 1948, and extend through 2023. 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 and extend through 2023:Q3. 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.”

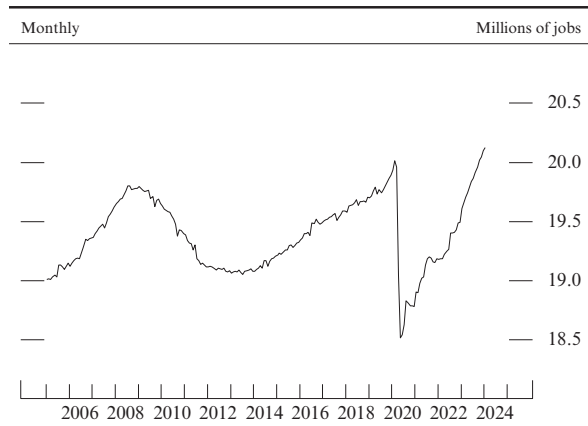
6. The growth of the deficit between fiscal years 2022 and 2023 would have been larger had it not been for the Administration’s announced student debt relief program, which raised the fiscal 2022 deficit \$380 billion, and the Supreme Court’s reversal of the policy, which lowered it \$330 billion in fiscal 2023.

27. State and local tax receipts



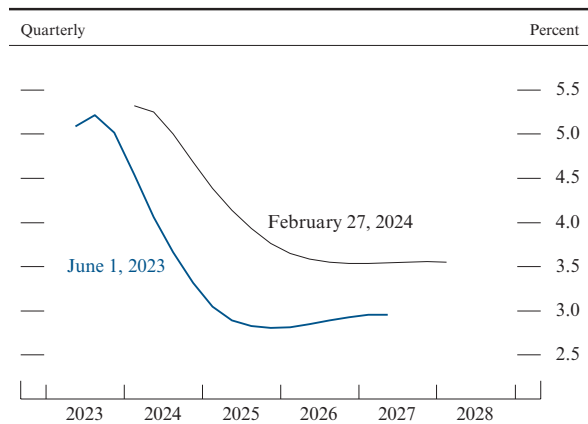
NOTE: Receipts shown are year-over-year percent changes of 4-quarter moving averages, begin in 2012:Q4, and extend through 2023:Q3. Property taxes are primarily collected by local governments. SOURCE: U.S. Census Bureau, Quarterly Summary of State and Local Government Tax Revenue.

28. State and local government payroll employment



SOURCE: Bureau of Labor Statistics via Haver Analytics.

29. Market-implied federal funds rate path



NOTE: The federal funds rate path is implied by quotes on overnight index swaps—a derivative contract tied to the effective federal funds rate. The implied path as of June 1, 2023, is compared with that as of February 27, 2024. The path is estimated with a spline approach, assuming a term premium of 0 basis points. The June 1, 2023, path extends through 2027:Q2 and the February 27, 2024, path through 2028:Q1.

SOURCE: Bloomberg; Federal Reserve Board staff estimates.

budget position overall (figure 27). Although state tax revenues weakened in 2023—mainly reflecting a normalization of receipts from elevated levels in the previous year as well as the effects of recently enacted tax cuts in some states—taxes as a percentage of GDP remained above recent historical norms. Moreover, states’ total balances (that is, including rainy day fund balances and previous-year surplus funds) continued to be near all-time highs. Nevertheless, budget situations varied widely across the states, with some states—particularly those that depend heavily on capital gains tax collections—facing tighter budget conditions. At the local level, overall property tax receipts rose briskly in 2023.

... contributing to brisk growth in employment and construction spending

Employment in state and local governments rose strongly in 2023, as some pandemic-related headwinds, such as an increase in retirements, have abated and wages became more competitive relative to those in the private sector (figure 28). Similarly, real construction outlays grew rapidly, reflecting easing bottlenecks and support from federal grants. By the end of 2023, both employment and construction spending were roughly back to their pre-pandemic levels.

Financial Developments

The expected level of the federal funds rate over the next few years is now higher than it was last June on net

Market-based measures of the expected federal funds rate rose considerably over the summer and early fall before moving down toward the end of 2023. On net, the market-implied policy rate path rose notably for year-end 2024, and somewhat more modestly for year-end 2025 and 2026 (figure 29).⁷ Financial market prices imply that the federal funds rate will decline

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

from current levels following the March 2024 FOMC meeting, reaching about 4.6 percent and about 3.7 percent by year-end 2024 and year-end 2025, respectively. Consistent with these market-implied measures, survey respondents in the Blue Chip Financial Forecasts published at the beginning of February expect the policy rate to begin to decrease in the second quarter of 2024 and reach 4.4 percent by year-end 2024. On net, respondents have significantly revised upward their expectations of the federal funds rate path since last June’s survey.

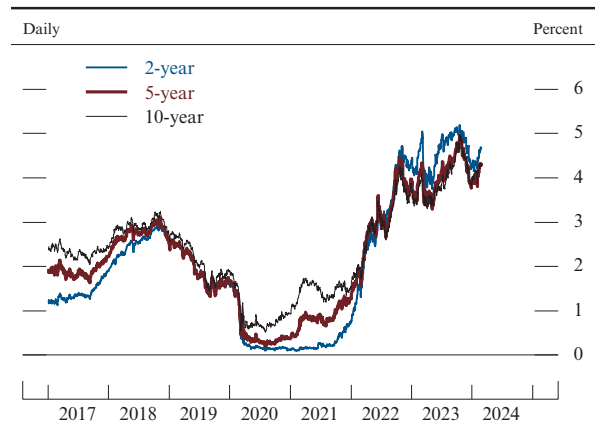
Yields on long-term U.S. nominal Treasury securities fluctuated considerably

Yields on long-term nominal Treasury securities began to increase in the spring of 2023 and rose markedly through mid-October before reversing course sharply, with the 10-year Treasury yield reaching a peak of about 5 percent before falling to just below 4 percent by the end of last year (figure 30). So far this year, long-term nominal Treasury yields have increased, with the 10-year Treasury yield rising to about 4.4 percent by late February. In contrast, short-term Treasury yields have been little changed, on net, since early June.

Yields on other long-term debt fluctuated with Treasury yields

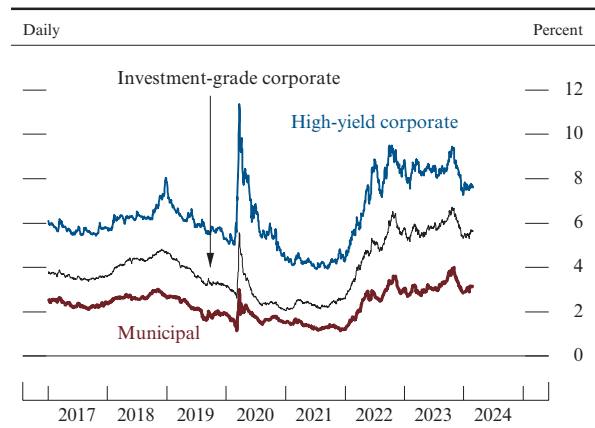
Corporate bond yields declined across credit categories since June, on net, amid sizable fluctuations that accompanied the observed large movements in long-term Treasury yields (figure 31). Spreads on corporate bonds over comparable-maturity Treasury securities narrowed notably, on net, especially for speculative-grade bonds, to levels in the lower range of their historical distributions. Similarly, municipal bond spreads over comparable-maturity Treasury securities narrowed substantially since June and are now fairly low relative to their historical distributions across credit ratings. Overall, corporate and municipal credit quality remained solid, with a low volume of defaults in both markets despite some increase in corporate bond defaults.

30. Yields on nominal Treasury securities



SOURCE: Department of the Treasury via Haver Analytics.

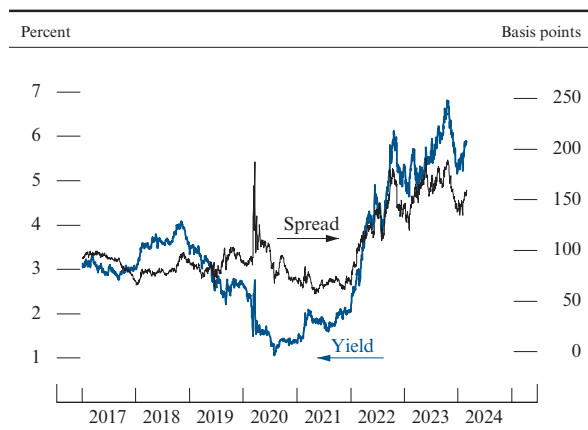
31. Corporate bond yields, by securities rating, and municipal bond yield



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.

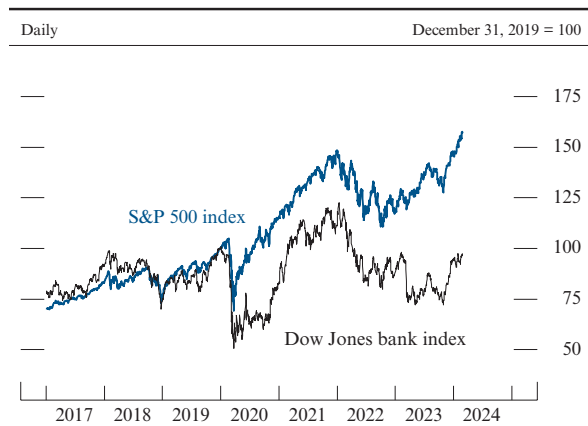
32. Yield and spread on agency mortgage-backed securities



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 2024.

33. Equity prices



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

Yields on agency mortgage-backed securities (MBS)—an important pricing factor for home mortgage interest rates—rose notably over the summer before falling back down toward the end of last year (figure 32). So far this year, yields on agency MBS have increased, standing in late February at levels notably above those in June 2023. The MBS spread decreased slightly since June, on net, but 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

The S&P 500 index increased significantly since June, on net, above the record-high levels seen at the end of 2021 (figure 33). Following a substantial decline over late summer and early fall, the S&P 500 index recovered toward the end of the year, as long-term interest rates declined, and continued to rise over the start of 2024. Meanwhile, small-cap firms, whose equity prices have significantly underperformed broad equity indexes, experienced substantial increases in their equity valuations in recent months amid better economic prospects, including expectations of a less restrictive monetary policy. Bank equity prices rose, on net, retracing some of the declines that had occurred over the first half of 2023 and that had been associated with strains in the banking sector. In the case of the largest banks, equity prices rose above their early-2023 levels; regional bank equity prices had only a partial retracement. One-month option-implied volatility on the S&P 500 index—the VIX—increased moderately until late October but subsequently declined to reach levels somewhat lower than those prevailing in early June. (For a discussion of financial stability issues, see the box “Developments Related to Financial Stability.”)

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. Acute stress in the banking system has receded since last spring, and banks' regulatory risk-based capital ratios remained solid and increased broadly, as bank profits were robust and banks reduced capital distributions. Nonetheless, declines in the fair value of fixed-rate assets at some banks have been sizable relative to regulatory capital. Valuation pressures increased modestly, with equity markets close to all-time highs in real terms and real estate prices still high relative to fundamentals. Credit to nonfinancial businesses and households continued to decrease relative to gross domestic product (GDP), and this ratio now sits close to its 20-year low. However, funding vulnerabilities remain notable. Hedge fund leverage is elevated, partly due to elevated activity in the cash-futures basis trade.

Broad equity prices are now at levels close to historical highs, driven mostly by performance of the largest companies. Nominal long-term Treasury yields rose to a 15-year peak in October but have now fallen to levels close to those from a year ago. Commercial real estate (CRE) prices continued to decline, especially in the office, retail, and multifamily sectors, and low levels of transactions in the office sector likely indicated that prices had not yet fully reflected the sector's weaker fundamentals. Prices of single-family residential properties, which held steady through the first quarter of 2023, have started rising again, albeit modestly, and remain high relative to market rents.

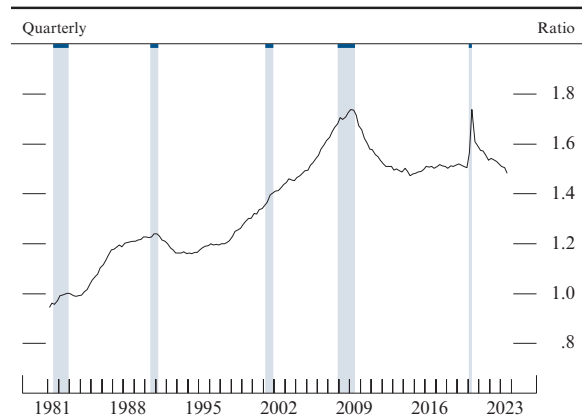
Vulnerabilities arising from household and nonfinancial business leverage remain moderate. The combined debt of both sectors as a share of GDP sat close to its lowest level in 20 years and continues to decrease (figure A). In the household sector, balance sheets remain strong, and homeowners' equity shares of houses are now at their highest levels in at least 30 years. Nonfinancial businesses' ability to service debt also remains adequate, as the pass-through of higher policy rates has so far been muted by the large share of long-term fixed-rate debt. Direct lending to

nonfinancial businesses by private credit funds and other private investors has been growing rapidly. While risks from leverage and investor redemption appear limited, the sector remains opaque, making it difficult to assess vulnerabilities.

Vulnerabilities in the financial sector remain notable, as losses in the fair value of long-dated bank assets remain significant. Risk-based capital ratios increased broadly across all bank categories and sit well above regulatory minimums, driven both by robust bank profitability and by a decrease in shareholder payouts at the largest banks. Credit quality at banks remained strong, although the quality of CRE loans backed by office, retail, and multifamily buildings continued its decline, a result of the lower demand for downtown real estate prompted by the shift toward telework. Some smaller regional and community banks with high concentrations of CRE loans are also highly reliant on uninsured deposits, potentially compounding vulnerabilities. Leverage at hedge funds stabilized at a high level as the Treasury cash-futures basis

(continued on next page)

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



NOTE: Data extend through 2023:Q3. The shaded bars with top caps indicate periods of business recession as defined by the National Bureau of Economic Research: 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.

Developments Related to Financial Stability *(continued)*

trade continued to grow, suggesting a risk of sudden deleveraging if volatility in Treasury markets increases unexpectedly. Leverage at life insurers also increased, although to levels near the middle of its historical distribution.

In terms of funding risks, liquidity remains ample, and deposits have stabilized recently. The number of banks with large declines in fair value relative to their regulatory capital and heavy reliance on uninsured deposits has declined significantly since March 2023. Overall, banks' reliance on short-term wholesale funding remained much lower than the typical range before the banking reforms of the previous decade. Money market funds continued to grow throughout the

second half of 2023, mostly because of increases in retail prime funds.

A routine survey of market contacts on salient shocks to financial stability highlights several important risks. Adverse developments in longer-term interest rates could potentially strain credit supply in vulnerable sectors. A related risk, the reemergence of banking-sector stress at some institutions, might further constrain the supply of credit, particularly at banks with large CRE concentration and a high fraction of uninsured deposits. Geopolitical risks remain salient, including Russia's war against Ukraine and potential spillovers of the Israel– Hamas war, and could cause strains in parts of the U.S. financial system.

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

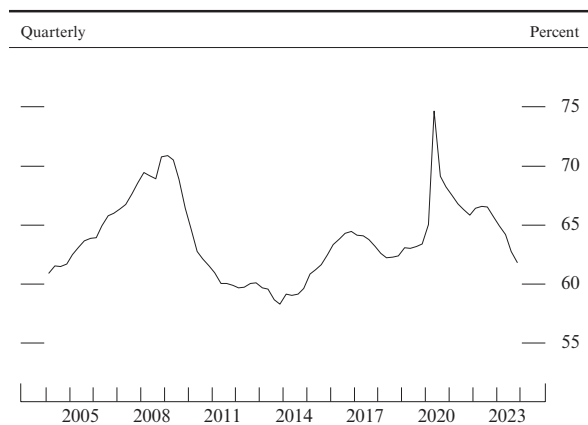
Treasury securities market functioning has continued to be orderly, but liquidity remained low by historical standards. The persistence of low liquidity is broadly in line with enduring high interest rate volatility, as future economic conditions and the policy rate path remain particularly uncertain. Market depth—a measure of the availability of contracts at the best quoted prices—for Treasury securities remains near historically low levels, particularly in the case of short-term Treasury securities. With regard to liquidity in the equity market, market depth based on S&P 500 futures was little changed and 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.

Short-term funding market conditions remained stable

Conditions in overnight bank funding and repurchase agreement (repo) markets remained stable. Since June, the effective federal funds rate and other unsecured overnight rates have been a few basis points below the interest rate on reserve balances, while the Secured Overnight Financing Rate has been at or slightly above the offering rate on the overnight reverse repurchase agreement (ON RRP) facility. Take-up at the ON RRP facility has declined substantially since June. This decline reflects a significant increase in the net supply of Treasury bills and relatively more attractive rates on alternative short-term investments such as private repo.

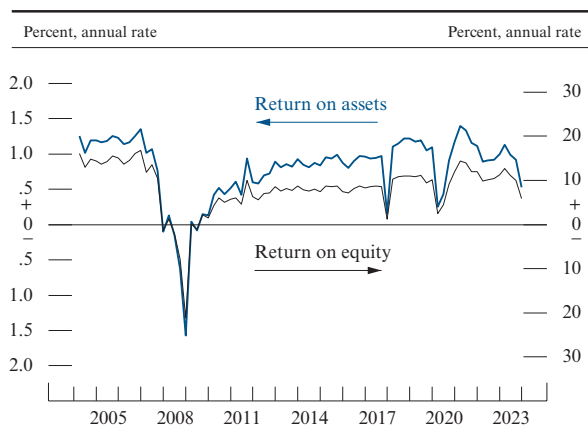
Money market funds (MMFs), the largest investors in the ON RRP facility, accounted for much of the decline in ON RRP take-up as they made a substantial reallocation of their investments toward Treasury bills and private repo. Both prime and government MMFs have seen a notable increase in assets under management since June, as relatively favorable

34. 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.

35. Profitability of bank holding companies



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

yields continue to attract funds previously held on deposit in the banking sector. Weighted average maturities at both prime and government MMFs increased in anticipation of fewer policy rate increases.

Bank credit growth continued to slow over the second half of 2023

The slowdown in bank credit growth was broad based, with growth in outstanding balances for all major loan categories slowing from earlier in the year, likely reflecting the effects of higher interest rates, tighter credit availability, and economic uncertainty (figure 34). Banks in the Senior Loan Officer Opinion Survey on Bank Lending Practices reported tighter standards and weaker demand over the third and fourth quarters, continuing trends for standards and demand that have been reported since the middle of 2022. Delinquency rates on bank loans generally rose in the second half of 2023—with the largest increases for commercial real estate and consumer loans—but remained around ranges observed before the pandemic except for consumer loans. Bank profitability moved down in the second half of 2023 to levels below those that prevailed before the pandemic (figure 35).

International Developments

Foreign economic growth slowed in the second half of 2023

Following a rebound in early 2023, foreign activity was subdued overall in the second half of last year, although with some variation across countries. In advanced foreign economies (AFEs), several factors restrained growth, including the tightening of monetary policy over the past two years—which weighed on credit growth and investment—and an erosion of real household incomes amid high inflation rates. In Europe, ongoing structural adjustment to higher energy prices also continued to hinder the performance of energy-intensive sectors. Economic indicators point to continued weakness in AFE growth in early 2024.

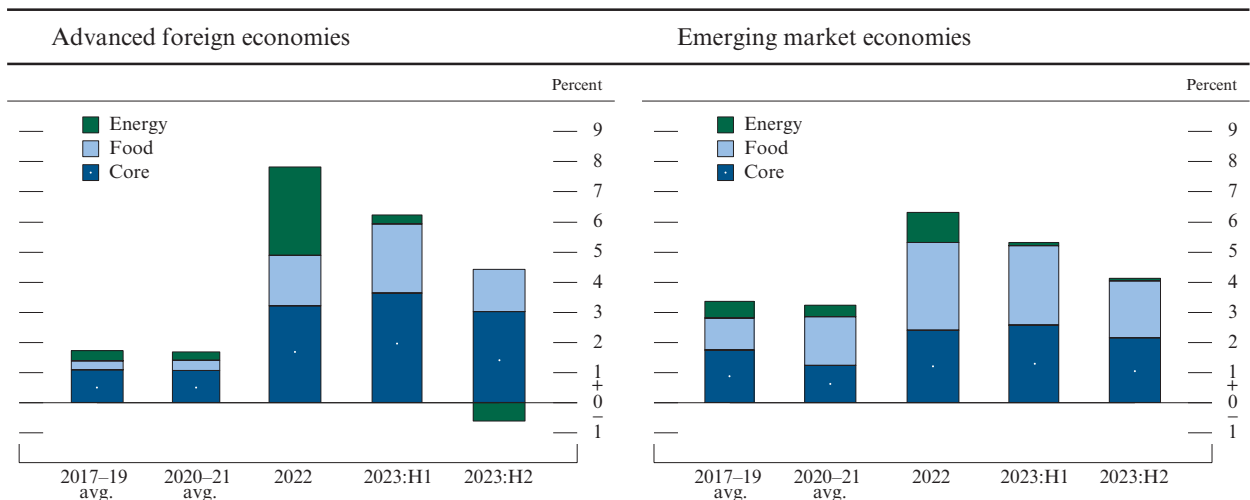
In China, a post-pandemic boost to economic growth early in 2023 faded by the second quarter, and property-sector weakness and sluggish domestic demand have remained a constraint on economic activity. Policy stimulus targeting infrastructure and manufacturing investment bolstered Chinese growth in the second half of the year, enabling the government to meet its 2023 growth target.

In emerging market economies (EMEs) other than China, economic activity slowed in the second half of last year but was more resilient overall than in the AFEs. Industrial production in emerging Asia excluding China began recovering, supported by a rebound in global demand for high-tech products that was driven in part by the artificial intelligence and electric vehicle sectors.

Inflation abroad has continued to ease but remains elevated

Foreign headline inflation has continued to decline since the middle of last year, reflecting lower core and food inflation (figure 36). Both the subsiding effects of past global supply bottlenecks and the drag on demand from monetary policy tightening have eased

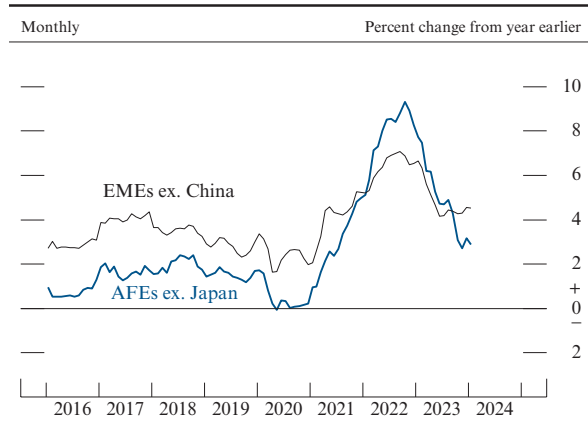
36. Components of foreign consumer price inflation



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, and begins in 2017:Q2. The inflation measure is the Harmonised Index of Consumer Prices for the euro area and the consumer price index for other economies. The data show percent changes from year-ago levels.

SOURCE: Federal Reserve Board staff calculations; Haver Analytics.

37. 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.

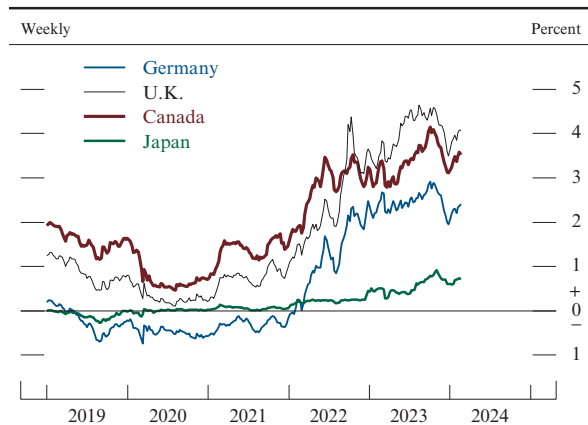
SOURCE: Federal Reserve Board staff calculations; Haver Analytics.

inflationary pressures (figure 37). However, the pace of disinflation has varied across sectors and countries. The deceleration in goods prices abroad has generally outpaced that in services prices, as in the U.S. Inflation remains above target in Europe but has been running near zero in China. Although the flare-up in geopolitical tensions in the Middle East and accompanying disruptions to shipping through the Red Sea have had only limited effects on consumer prices in general and on global energy prices in particular, further escalation in tensions could disrupt global momentum toward restoring lower inflation.

Foreign central banks are maintaining a restrictive monetary policy stance

Most foreign central banks paused their interest rate hikes in the second half of last year and have since held policy rates steady, acknowledging the cumulative tightening of policy and progress in lowering inflation. Policy rate paths implied by financial market pricing suggest that many AFE central banks are expected to begin reducing interest rates in 2024. Several EME central banks have already begun easing monetary policy. However, foreign central banks have generally continued to emphasize in their communications that progress toward achieving their inflation goals could slow or even reverse, including from resilience in labor markets, wage growth, or geopolitical developments leading to higher commodity prices and trade costs.

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



NOTE: The data are weekly averages of daily benchmark yields and extend through February 23, 2024.

SOURCE: Bloomberg.

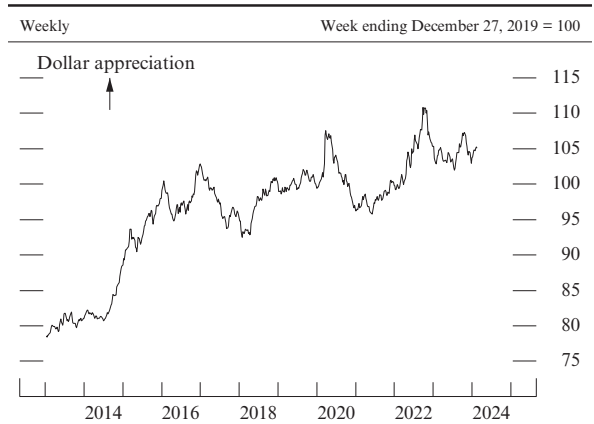
Financial conditions abroad have been volatile but have eased, on balance, since mid-2023

Near-dated AFE sovereign yields declined toward the end of last year as central banks signaled they had reached or neared the end of policy rate tightening. Longer-term sovereign yields unwound most of the increase registered earlier in 2023 (figure 38). One exception was Japan, where the central bank widened the band around its yield curve control target, allowing yields on 10-year government securities to increase, on net, in 2023.

Since mid-2023, the broad dollar index—a measure of the exchange value of the dollar against a trade-weighted basket of foreign currencies—increased slightly on net (figure 39). The dollar index was volatile, increasing significantly as U.S. yields rose from July to October and then reversing most of these increases as U.S. yields declined.

Many major foreign equity indexes rose across AFEs and EMEs, although gains were near zero in the U.K., consistent with stagnant economic activity (figure 40). Chinese equity prices were an exception, with declines amid pessimism about growth prospects and a pullback by foreign investors from Chinese markets. Flows to EME-focused investment funds turned negative in mid-2023, as yields on advanced-economy bonds rose more than those in emerging economies. These outflows eased toward the end of the year as AFE yields fell. EME sovereign spreads narrowed moderately last year.

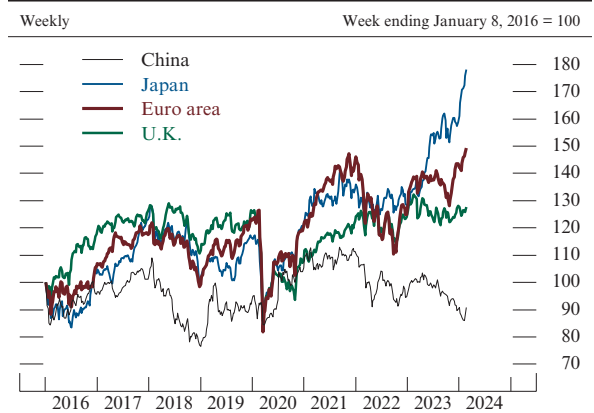
39. U.S. dollar exchange rate index



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 February 23, 2024. 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.”

40. Equity indexes for selected foreign economies



NOTE: The data are weekly averages of daily data and extend through February 23, 2024.

SOURCE: For the euro area, Dow Jones Euro Stoxx Index; for Japan, Tokyo Stock Price Index; for China, Shanghai Composite Index; for the U.K., FTSE 100 Index; all via Bloomberg. (For Dow Jones Indices licensing information, see the note on the Contents page.)

PART 2

MONETARY POLICY

After one additional increase in July, the Federal Open Market Committee has held the federal funds rate steady . . .

The Federal Open Market Committee (FOMC) has maintained the target range for the federal funds rate at 5¼ to 5½ percent since its July 2023 meeting (figure 41). The Committee views the policy rate as likely at its peak for this tightening cycle; since early 2022, the FOMC raised the target range a total of 525 basis points. The FOMC’s policy tightening actions have reflected its commitment to return inflation to its 2 percent objective. Restoring price stability is essential to achieve a sustained period of strong labor market conditions that benefit all.

As labor market tightness has eased and progress on inflation has continued, the risks to achieving the Committee’s employment and inflation goals have been moving into better balance. Even so, the Committee remains highly attentive to inflation risks and is acutely aware that high inflation imposes significant hardship, especially on those least able to meet the higher costs of essentials, like food,

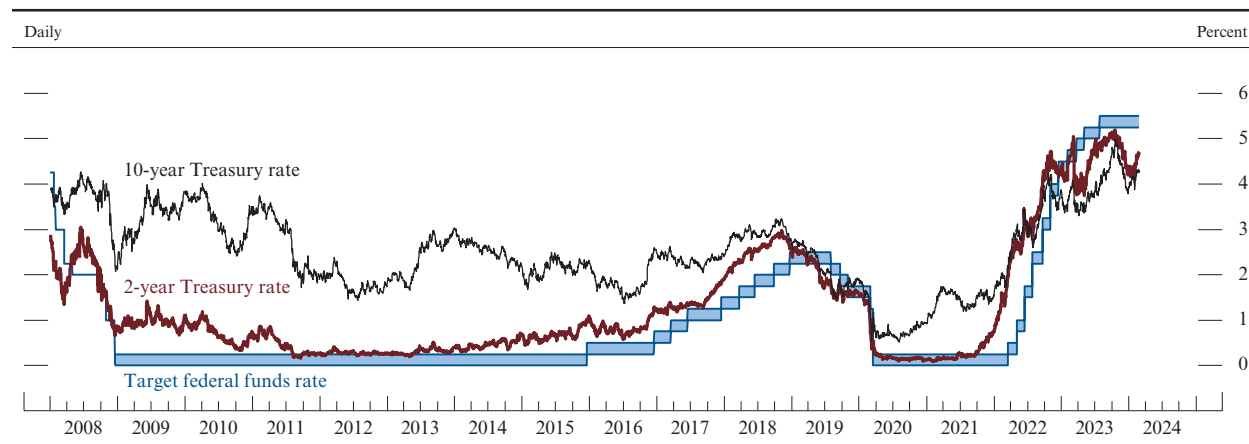
housing, and transportation. In considering any adjustments to the target range for the federal funds rate, the Committee will carefully assess incoming data, the evolving outlook, and the balance of risks. The Committee does not expect it will be appropriate to reduce the target range until it has gained greater confidence that inflation is moving sustainably toward 2 percent.

. . . 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.⁸ Since September 2022, principal payments from securities held in the System

8. 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>.

41. 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 debt and agency mortgage-backed securities. As a result of these actions, the SOMA holdings of Treasury and agency securities have declined about \$1.4 trillion since the start of balance sheet reduction to around \$7.1 trillion, a level equivalent to about 25 percent of U.S. nominal gross domestic product as compared with a peak of 35 percent reached at the end of 2021 (figure 42). Despite this decline in SOMA holdings, reserve balances increased \$217 billion, to a level of around \$3.5 trillion, as the corresponding decline in the Federal Reserve’s liabilities was concentrated in usage of the overnight reverse repurchase agreement facility. (See the box “Developments in the Federal Reserve’s Balance Sheet and Money Markets.”)

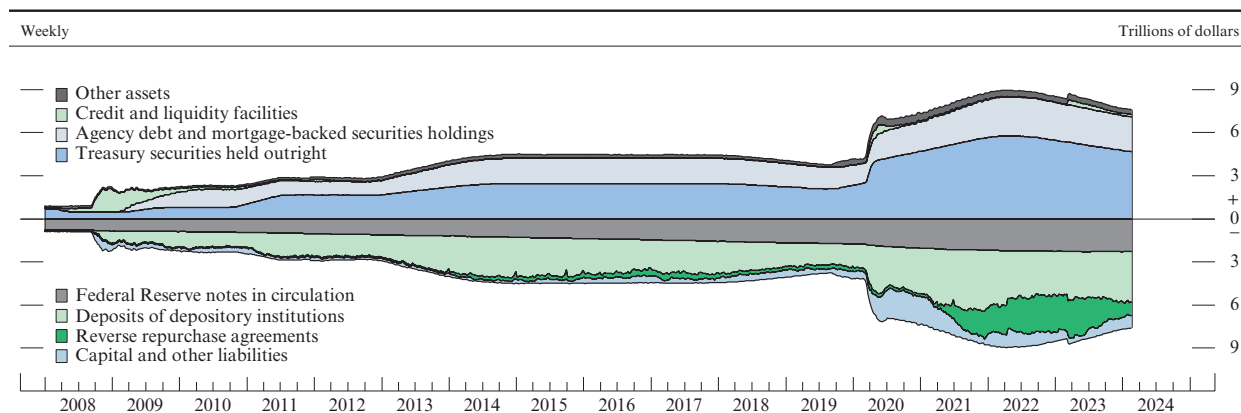
The FOMC has stated that it intends to maintain securities holdings at amounts consistent with implementing monetary policy efficiently and effectively in its ample-reserves regime. To ensure a smooth transition,

the FOMC intends to slow and then stop reductions in its securities holdings when reserve balances are somewhat above the level that 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 an ample level. 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

As already indicated, the FOMC is strongly committed to returning inflation to its 2 percent objective, and, in considering any adjustments to the target range for the federal funds rate, the Committee will carefully assess incoming data, the evolving outlook, and the balance of risks. Its assessments will take into account a wide range of information, including readings on labor market conditions, inflation pressures and inflation expectations,

42. 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 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 February 21, 2024. SOURCE: Federal Reserve Board, Statistical Release H.4.1, “Factors Affecting Reserve Balances.”

and financial and international developments. The Committee has noted that it is also prepared to adjust 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. The Federal Reserve has regular arrangements under which it hears from a broad range of participants in the U.S. economy about how monetary policy affects people's daily lives and livelihoods. In particular, the Federal Reserve has continued to gather insights into these matters 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. However, simple rules cannot capture all of the complex considerations that go into the formation of appropriate monetary policy, and many practical considerations make it undesirable for the FOMC to adhere strictly to the prescriptions of any specific rule. Nevertheless, some principles of good monetary policy can be brought out by examining these simple 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 (SOMA) portfolio, consistent with its plans for reducing the size of the Federal Reserve's balance sheet. Since the time of the June 2023 report, total Federal Reserve assets have decreased \$806 billion, leaving the total size of the balance sheet at \$7.6 trillion, \$1.3 trillion smaller since the reduction in the size of the SOMA portfolio began

in June 2022 (figures A and B). This discussion reviews recent developments in the Federal Reserve's balance sheet and money market conditions.

While the reduction in the size of the SOMA portfolio has continued as planned, amid the banking-sector developments of spring 2023, the Federal Reserve provided liquidity to help ensure the stability of the banking system and the ongoing provision of money

(continued)

A. Balance sheet comparison

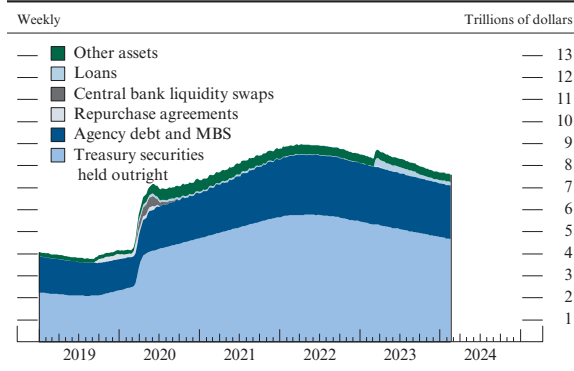
Billions of dollars

	February 21, 2024	June 14, 2023	Change (since June 2023)	Change (since Fed's balance sheet reduction began on June 1, 2022)
Assets				
Total securities				
Treasury securities	4,661	5,160	-499	-1,109
Agency debt and MBS	2,417	2,561	-144	-293
Net unamortized premiums	274	298	-24	-63
Repurchase agreements	0	0	0	0
Loans and lending facilities				
PPPLF	3	8	-5	-17
Discount window	2	4	-2	2
BTFP	164	102	62	164
Other credit extensions	0	180	-180	0
Other loans and lending facilities	15	28	-13	-20
Central bank liquidity swaps	0	0	0	0
Other assets	44	48	-4	2
Total assets	7,582	8,388	-806	-1,333
Liabilities				
Federal Reserve notes	2,280	2,292	-12	50
Reserves held by depository institutions	3,523	3,306	217	166
Reverse repurchase agreements				
Foreign official and international accounts	340	328	12	74
Others	575	2,109	-1,534	-1,390
U.S. Treasury General Account	789	135	654	8
Other deposits	164	220	-56	-84
Other liabilities and capital	-89	-2	-87	-157
Total liabilities and capital	7,582	8,388	-806	-1,333

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.

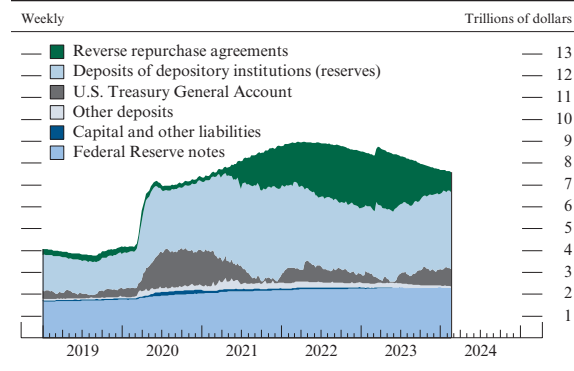
SOURCE: Federal Reserve Board, Statistical Release H.4.1, "Factors Affecting Reserve Balances."

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 February 21, 2024.
SOURCE: Federal Reserve Board, Statistical Release H.4.1, "Factors Affecting Reserve Balances."

C. Federal Reserve liabilities



NOTE: "Capital and other liabilities" includes Treasury contributions and is negative on February 21, 2024, 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 February 21, 2024.
SOURCE: Federal Reserve Board, Statistical Release H.4.1, "Factors Affecting Reserve Balances."

and credit to the economy.¹ Loans under the Bank Term Funding Program—which made additional funding and liquidity available to eligible depository institutions to support American businesses and households and which will cease making new loans as scheduled on March 11, 2024—have increased \$62 billion since June 2023 (figure A).²

1. The loans that were extended to depository institutions (DIs) placed into Federal Deposit Insurance Corporation (FDIC) receivership in March 2023 have been fully repaid. The Federal Reserve Banks' loans to these DIs are secured by pledged collateral, and the FDIC provides repayment guarantees. For additional information, see Board of Governors of the Federal Reserve System (2024), "Additional Information on Other Credit Extensions," webpage, January 4, <https://www.federalreserve.gov/monetarypolicy/additional-information-on-other-credit-extensions.htm>.

2. The Bank Term Funding Program (BTFP) was established under section 13(3) of the Federal Reserve Act with the approval of the Secretary of the Treasury. The BTFP offers loans of up to one year to banks, savings associations, credit unions, and other eligible DIs against collateral such as U.S. Treasury securities, U.S. agency securities, and U.S. agency mortgage-backed securities. For more details, see Board of Governors of the Federal Reserve System (2024), "Bank Term Funding Program," webpage, February 13, <https://www.federalreserve.gov/financial-stability/bank-term-funding-program.htm>.

The interest rate applicable to new BTFP loans has been adjusted such that the rate on new loans extended from January 25, 2024, through program expiration will be no lower than the interest rate on reserve balances in effect on the day the loan is made. This rate adjustment ensures that the BTFP continues to support the goals of the program in

Despite the ongoing reduction in the Federal Reserve's securities holdings, reserve balances—the largest liability item on the Federal Reserve's balance sheet—have increased \$217 billion since June 2023, given other changes in the composition of the Federal Reserve's liabilities over this period.³ Since June 2023, usage of the overnight reverse repurchase agreement (ON RRP) facility has declined \$1.5 trillion, while balances in the Treasury General Account have increased \$654 billion (figures A and C). On net, changes in these and other nonreserve liabilities have resulted in an increase in reserve balances.

After remaining above \$2 trillion during the first half of 2023, usage of the ON RRP facility has declined to

(continued on next page)

the current interest rate environment. After March 11, 2024, banks and other DIs will continue to have ready access to the discount window to meet liquidity needs. For additional information, see Board of Governors of the Federal Reserve System (2024), "Federal Reserve Board Announces the Bank Term Funding Program (BTFP) Will Cease Making New Loans as Scheduled on March 11," press release, January 24, <https://www.federalreserve.gov/newsevents/pressreleases/monetary20240124a.htm>.

3. 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.

Federal Reserve's Balance Sheet and Money Markets *(continued)*

about \$575 billion amid the ongoing reduction in the Federal Reserve's balance sheet and the substantial increase in net supply of Treasury securities. Reduced usage of the ON RRP facility largely reflects money market funds shifting their portfolio toward higher-yielding investments, including Treasury bills and private-market repurchase agreements.

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—the interest rate 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 tightened the stance of monetary policy.

The Federal Reserve's expenses have continued to exceed its income over recent months. The Federal

Reserve's deferred asset increased \$82 billion since last June to a level of \$152 billion.⁴ 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.⁵

4. 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. 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.

5. Net income is expected to turn positive again 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 regularly 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 above the Federal Open Market Committee’s (FOMC) 2 percent longer-run objective, and labor market conditions have been tight. Although inflation remains elevated, it has eased considerably over the past year, and labor supply and demand have come into better balance. Against this backdrop, the simple monetary policy rules considered in this discussion have called for elevated levels of the federal funds rate over 2021, 2022, and the first half of 2023, but the rates prescribed by these rules have now declined to values close to the current target range for the federal funds rate at 5¼ to 5½ percent. In support of its goals of maximum employment and inflation at the rate of 2 percent over the longer run, the FOMC has maintained the federal funds rate at 5¼ to 5½ percent since July while continuing to reduce its holdings of Treasury securities and agency debt and agency mortgage-backed securities.

Selected Policy Rules: Descriptions

In many economic models, desirable economic outcomes can be achieved over time if monetary policy responds to changes in economic conditions in a manner that is predictable and adheres to some key design principles. 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

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

these rules, along with a “balanced approach (shortfalls)” rule, which responds to the unemployment rate only when it is higher than its estimated longer-run level.² All of the simple rules shown embody key design principles of good monetary policy, including the requirement that the policy rate should be adjusted by 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 on next page)

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 provided 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 to deriving policy rate prescriptions other than through the use of simple rules.

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 has been less restrictive than that of the balanced-approach rule since 2022:Q1.

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

Monetary Policy Rules *(continued)*

A. Monetary policy rules

Taylor (1993) rule	$R_t^{T93} = r_t^{LR} + \pi_t + 0.5(\pi_t - \pi^{LR}) + (u_t^{LR} - u_t)$
Balanced-approach rule	$R_t^{BA} = r_t^{LR} + \pi_t + 0.5(\pi_t - \pi^{LR}) + 2(u_t^{LR} - u_t)$
Balanced-approach (shortfalls) rule	$R_t^{BAS} = r_t^{LR} + \pi_t + 0.5(\pi_t - \pi^{LR}) + 2\min\{u_t^{LR} - u_t, 0\}$
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 realized nominal federal funds rate for quarter $t-1$, π_t is the 4-quarter price inflation for quarter t , u_t is the unemployment rate in quarter t , and r_t^{LR} is the level of the neutral real federal funds rate in the longer run that is expected to be consistent with sustaining maximum employment and inflation at the Federal Open Market Committee's 2 percent longer-run objective, π^{LR} . In addition, u_t^{LR} is the rate of unemployment expected in the longer run. Z_t is the cumulative sum of past deviations of the federal funds rate from the prescriptions of the Taylor (1993) rule when that rule prescribes setting the federal funds rate below an effective lower bound (ELB) of 12.5 basis points.

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

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 than what would be obtained under the Taylor (1993) and balanced-approach rules.

prescribed by the standard Taylor (1993) rule until after the economy begins to recover.

Policy Rules: Limitations

As benchmarks for monetary policy, simple policy rules have important limitations. One of these limitations is that the simple policy rules mechanically 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. In addition, the structure of the economy and current economic conditions differ in important respects from those prevailing when the simple policy rules were originally devised and proposed. As a result, most simple policy rules do not

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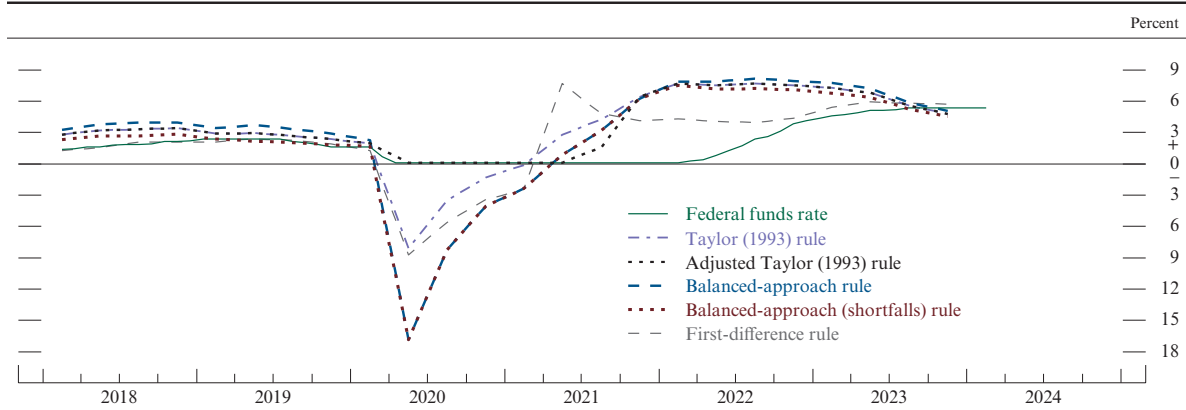
take into account the ELB on interest rates, which limits the extent to which the policy rate can be lowered to support the economy. This constraint was particularly evident during the pandemic-driven recession, when the lower bound on the policy rate motivated the FOMC's other policy actions to support the economy. Relatedly, another limitation is that simple policy rules do not explicitly take into account other important tools of monetary policy, such as balance sheet policies. Finally, simple policy rules are not forward looking and do not allow for important risk-management considerations, associated with uncertainty about economic relationships and the evolution of the economy, that factor into FOMC decisions.

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 of monetary policy in response to the pandemic-driven recession, followed by positive values as inflation picked up and labor market conditions strengthened. In 2022 and during the first half of 2023, 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. Because inflation has eased recently, the policy rates prescribed by these rules have now declined to values that are close to the federal funds rate.

Selected Policy Rules: Prescriptions

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

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, the unemployment rate, and inflation used in the computation of the rules' prescriptions are interpolations to quarterly values of projections from the Survey of Primary Dealers. 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 and extend through February 2024.

SOURCE: Federal Reserve Bank of Philadelphia; Federal Reserve Bank of New York, Survey of Primary Dealers; Federal Reserve Board staff estimates.

PART 3

SUMMARY OF ECONOMIC PROJECTIONS

The following material was released after the conclusion of the December 12–13, 2023, meeting of the Federal Open Market Committee.

In conjunction with the Federal Open Market Committee (FOMC) meeting held on December 12–13, 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 2026 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, December 2023
Percent

Variable	Median ¹					Central tendency ²					Range ³				
	2023	2024	2025	2026	Longer run	2023	2024	2025	2026	Longer run	2023	2024	2025	2026	Longer run
Change in real GDP	2.6	1.4	1.8	1.9	1.8	2.5–2.7	1.2–1.7	1.5–2.0	1.8–2.0	1.7–2.0	2.5–2.7	0.8–2.5	1.4–2.5	1.6–2.5	1.6–2.5
September projection	2.1	1.5	1.8	1.8	1.8	1.9–2.2	1.2–1.8	1.6–2.0	1.7–2.0	1.7–2.0	1.8–2.6	0.4–2.5	1.4–2.5	1.6–2.5	1.6–2.5
Unemployment rate	3.8	4.1	4.1	4.1	4.1	3.8	4.0–4.2	4.0–4.2	3.9–4.3	3.8–4.3	3.7–4.0	3.9–4.5	3.8–4.7	3.8–4.7	3.5–4.3
September projection	3.8	4.1	4.1	4.0	4.0	3.7–3.9	3.9–4.4	3.9–4.3	3.8–4.3	3.8–4.3	3.7–4.0	3.7–4.5	3.7–4.7	3.7–4.5	3.5–4.3
PCE inflation	2.8	2.4	2.1	2.0	2.0	2.7–2.9	2.2–2.5	2.0–2.2	2.0	2.0	2.7–3.2	2.1–2.7	2.0–2.5	2.0–2.3	2.0
September projection	3.3	2.5	2.2	2.0	2.0	3.2–3.4	2.3–2.7	2.0–2.3	2.0–2.2	2.0	3.1–3.8	2.1–3.5	2.0–2.9	2.0–2.7	2.0
Core PCE inflation ⁴	3.2	2.4	2.2	2.0		3.2–3.3	2.4–2.7	2.0–2.2	2.0–2.1		3.2–3.7	2.3–3.0	2.0–2.6	2.0–2.3	
September projection	3.7	2.6	2.3	2.0		3.6–3.9	2.5–2.8	2.0–2.4	2.0–2.3		3.5–4.2	2.3–3.6	2.0–3.0	2.0–2.9	
Memo: Projected appropriate policy path															
Federal funds rate	5.4	4.6	3.6	2.9	2.5	5.4	4.4–4.9	3.1–3.9	2.5–3.1	2.5–3.0	5.4	3.9–5.4	2.4–5.4	2.4–4.9	2.4–3.8
September projection	5.6	5.1	3.9	2.9	2.5	5.4–5.6	4.6–5.4	3.4–4.9	2.5–4.1	2.5–3.3	5.4–5.6	4.4–6.1	2.6–5.6	2.4–4.9	2.4–3.8

NOTE: Projections of change in real gross domestic product (GDP) and projections for both measures of inflation are percent changes from the fourth quarter of the previous year to the fourth quarter of the year indicated. PCE inflation and core PCE inflation are the percentage rates of change in, respectively, the price index for personal consumption expenditures (PCE) and the price index for PCE excluding food and energy. Projections for the unemployment rate are for the average civilian unemployment rate in the fourth quarter of the year indicated. Each participant’s projections are based on his or her assessment of appropriate monetary policy. Longer-run projections represent each participant’s assessment of the rate to which each variable would be expected to converge under appropriate monetary policy and in the absence of further shocks to the economy. The projections for the federal funds rate are the value of the midpoint of the projected appropriate target range for the federal funds rate or the projected appropriate target level for the federal funds rate at the end of the specified calendar year or over the longer run. The September projections were made in conjunction with the meeting of the Federal Open Market Committee on September 19–20, 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 September 19–20, 2023, meeting, and one participant did not submit such projections in conjunction with the December 12–13, 2023, meeting.

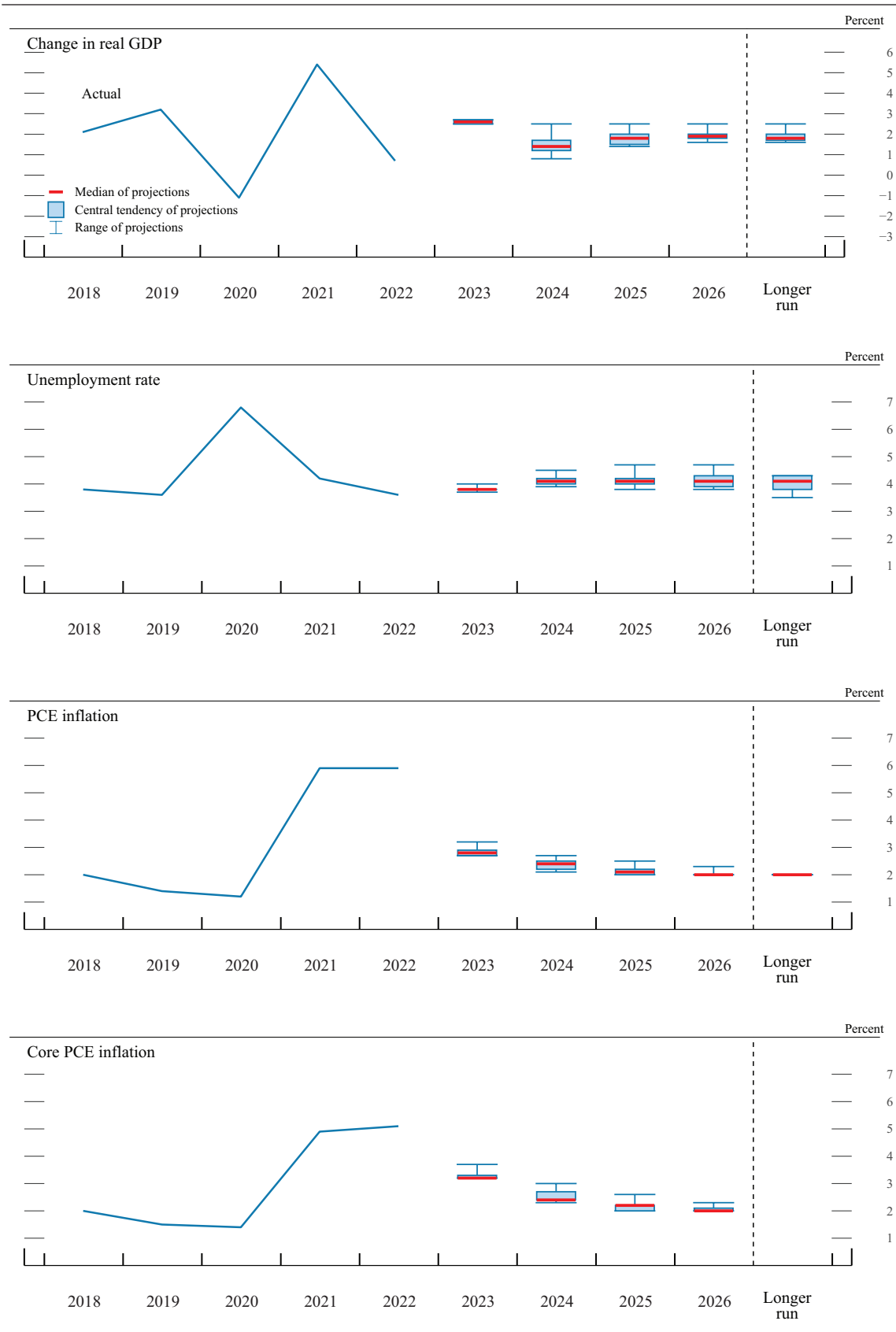
1. For each period, the median is the middle projection when the projections are arranged from lowest to highest. When the number of projections is even, the median is the average of the two middle projections.

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.

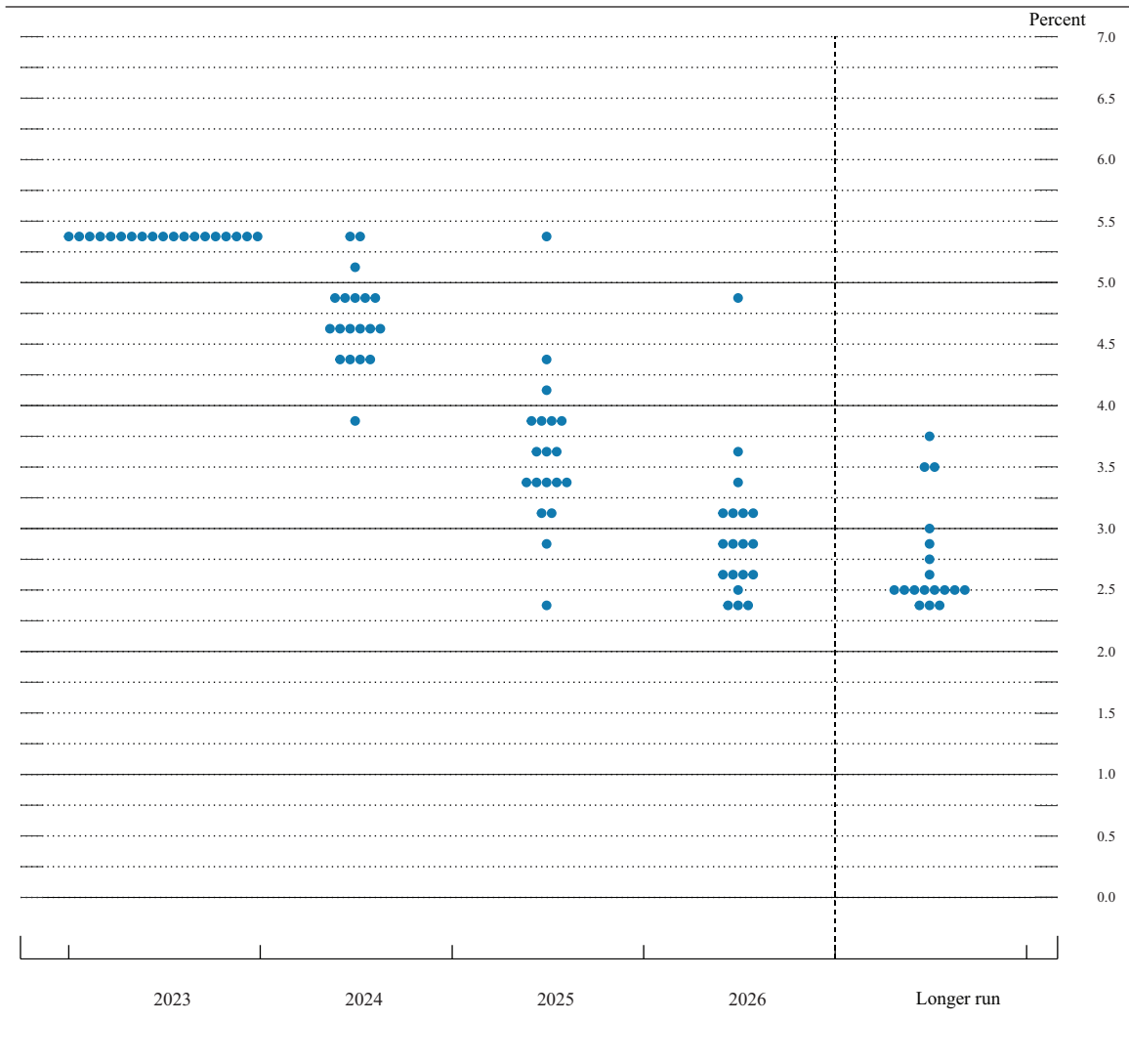
4. Longer-run projections for core PCE inflation are not collected.

Figure 1. Medians, central tendencies, and ranges of economic projections, 2023–26 and over the longer run



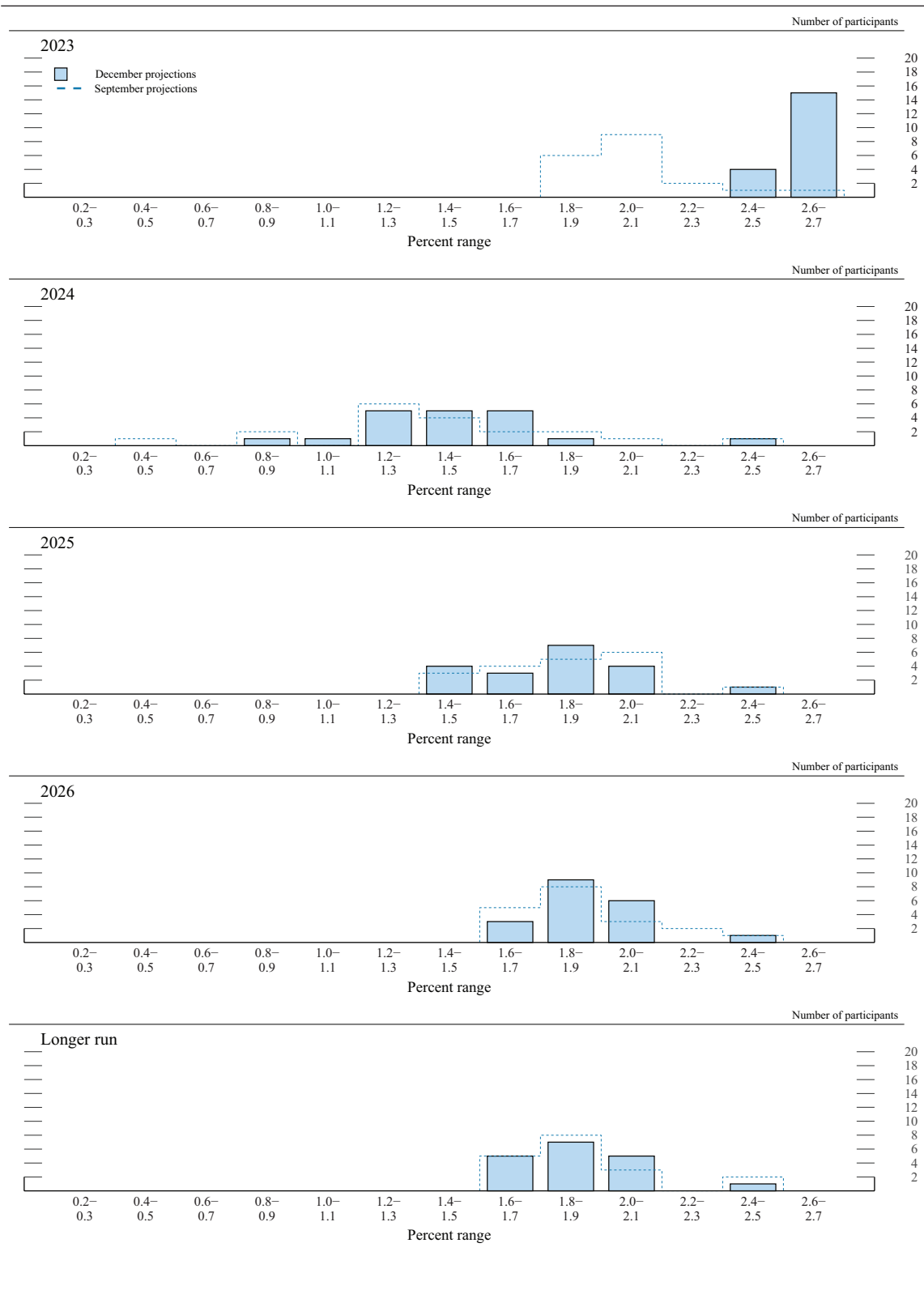
NOTE: Definitions of variables and other explanations are in the notes to table 1. The data for the actual values of the variables are annual.

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



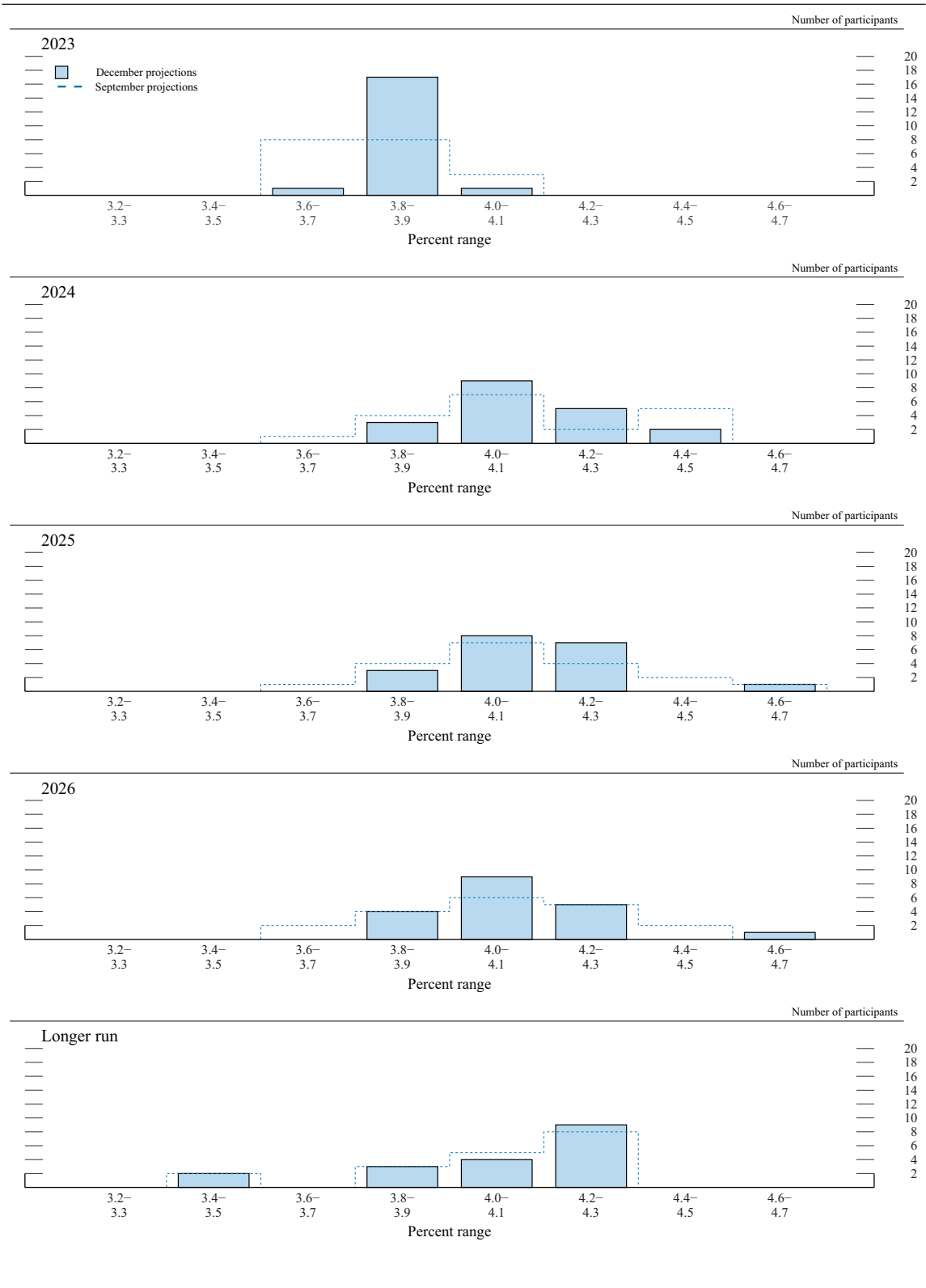
NOTE: Each shaded circle indicates the value (rounded to the nearest 1/8 percentage point) of an individual participant's judgment of the midpoint of the appropriate target range for the federal funds rate or the appropriate target level for the federal funds rate at the end of the specified calendar 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, 2023–26 and over the longer run



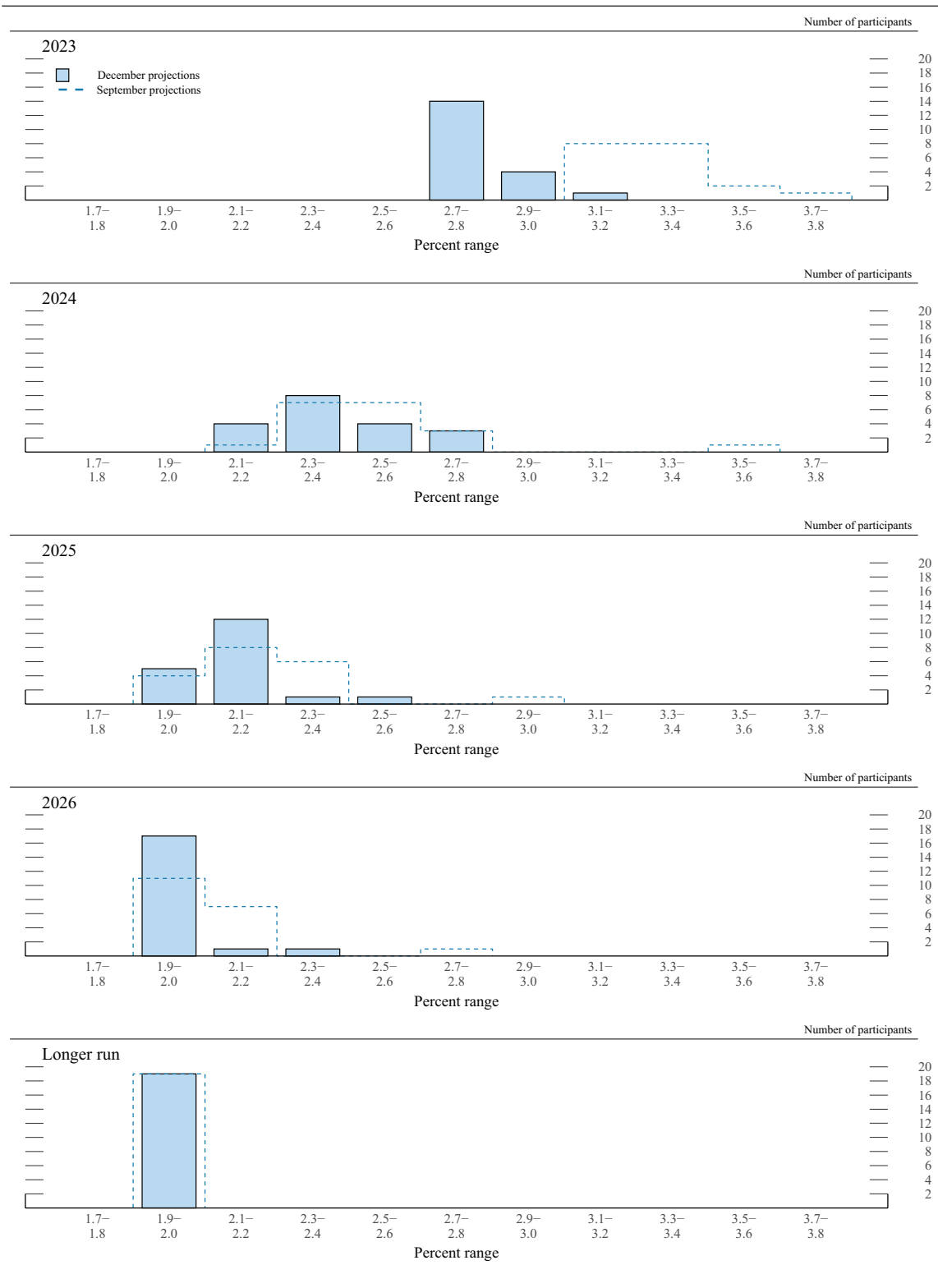
NOTE: Definitions of variables and other explanations are in the notes to table 1.

Figure 3.B. Distribution of participants' projections for the unemployment rate, 2023–26 and over the longer run



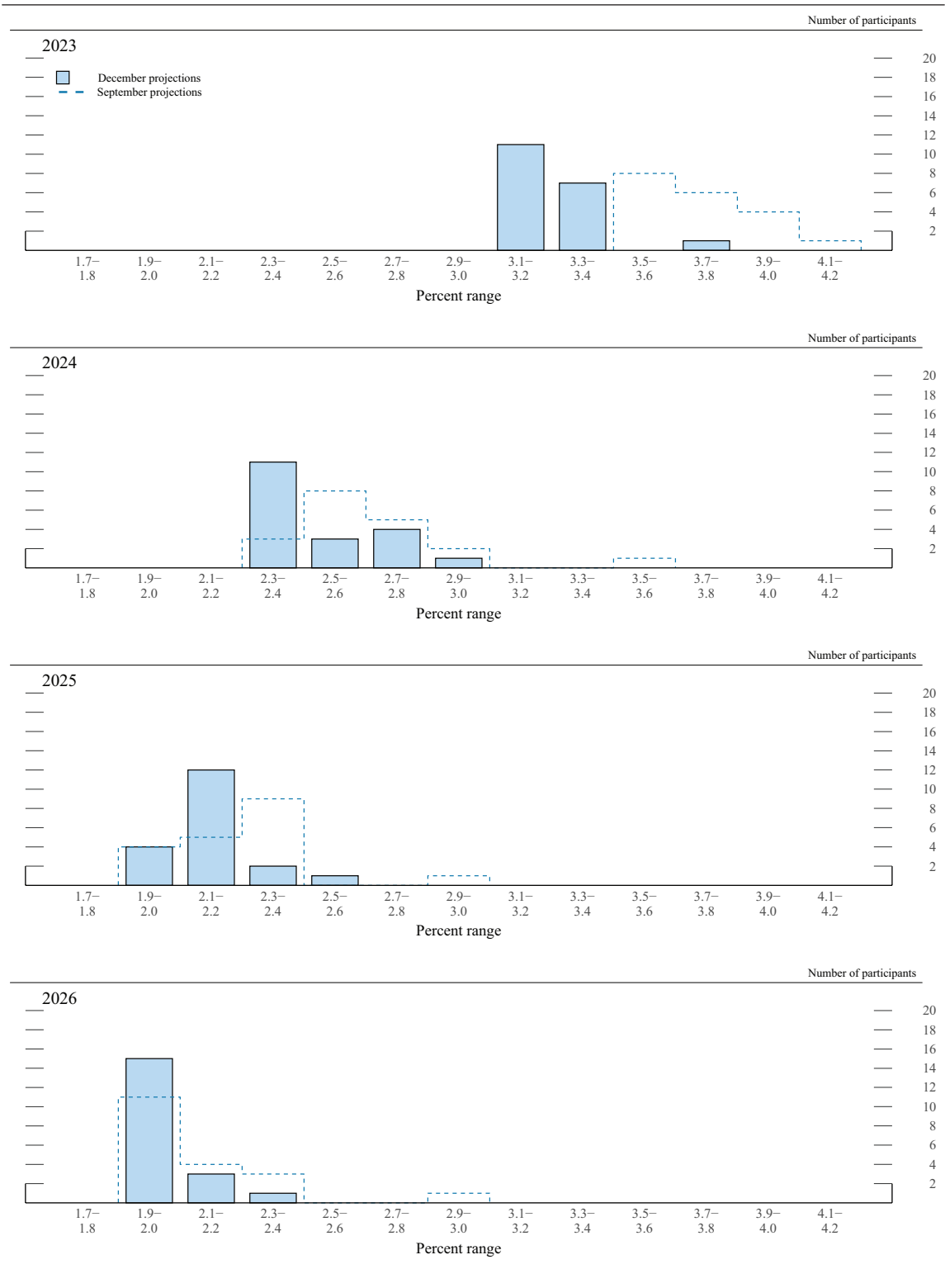
NOTE: Definitions of variables and other explanations are in the notes to table 1.

Figure 3.C. Distribution of participants' projections for PCE inflation, 2023–26 and over the longer run



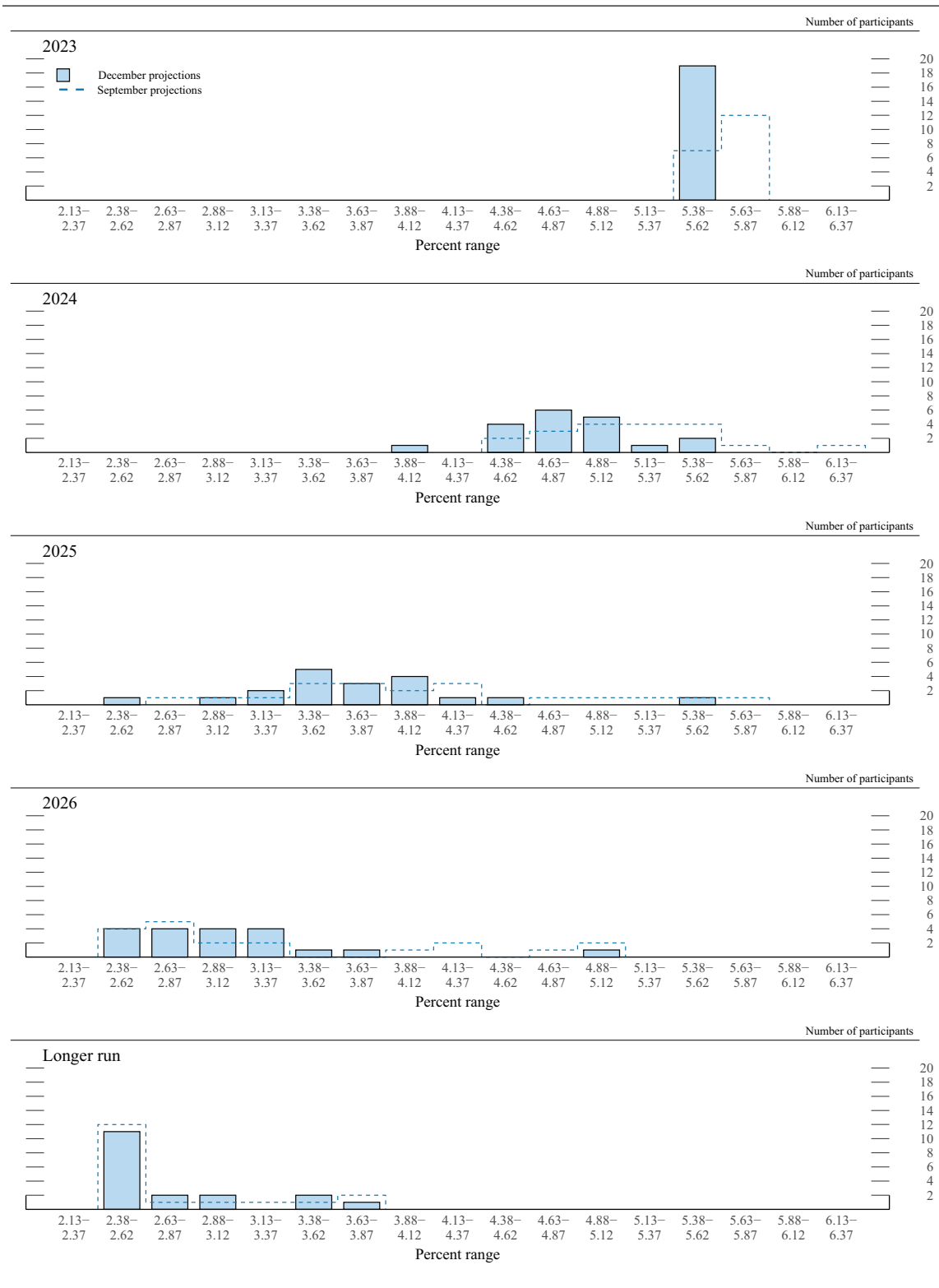
NOTE: Definitions of variables and other explanations are in the notes to table 1.

Figure 3.D. Distribution of participants' projections for core PCE inflation, 2023–26



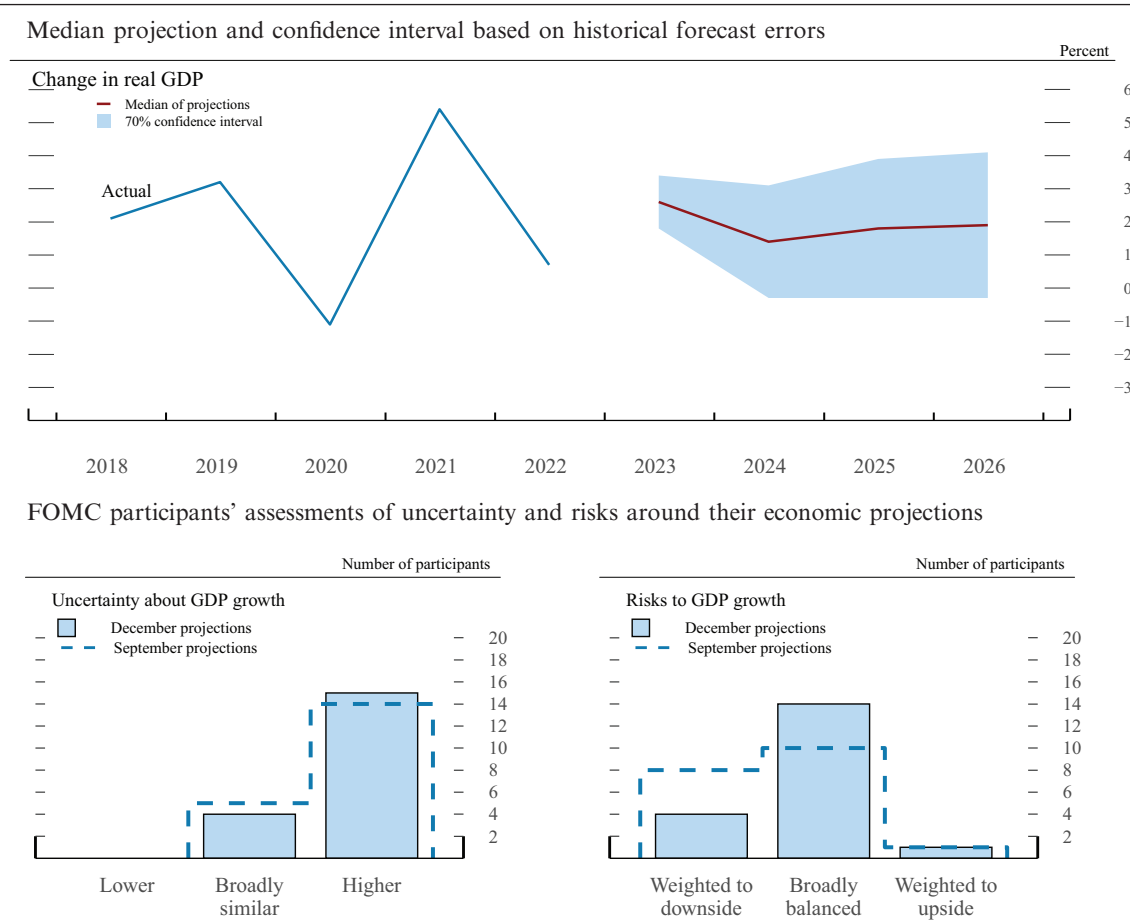
NOTE: Definitions of variables and other explanations are in the notes to table 1.

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, 2023–26 and over the longer run



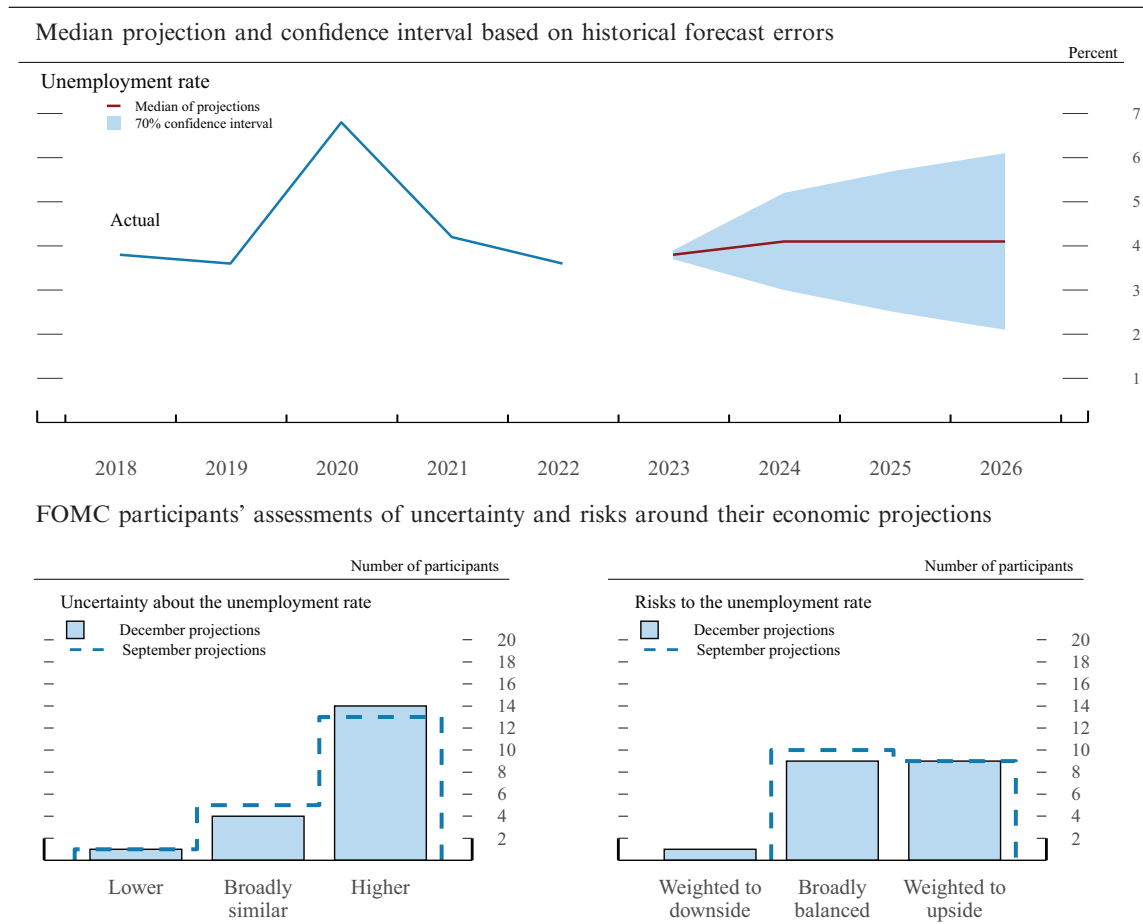
NOTE: Definitions of variables and other explanations are in the notes to table 1.

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



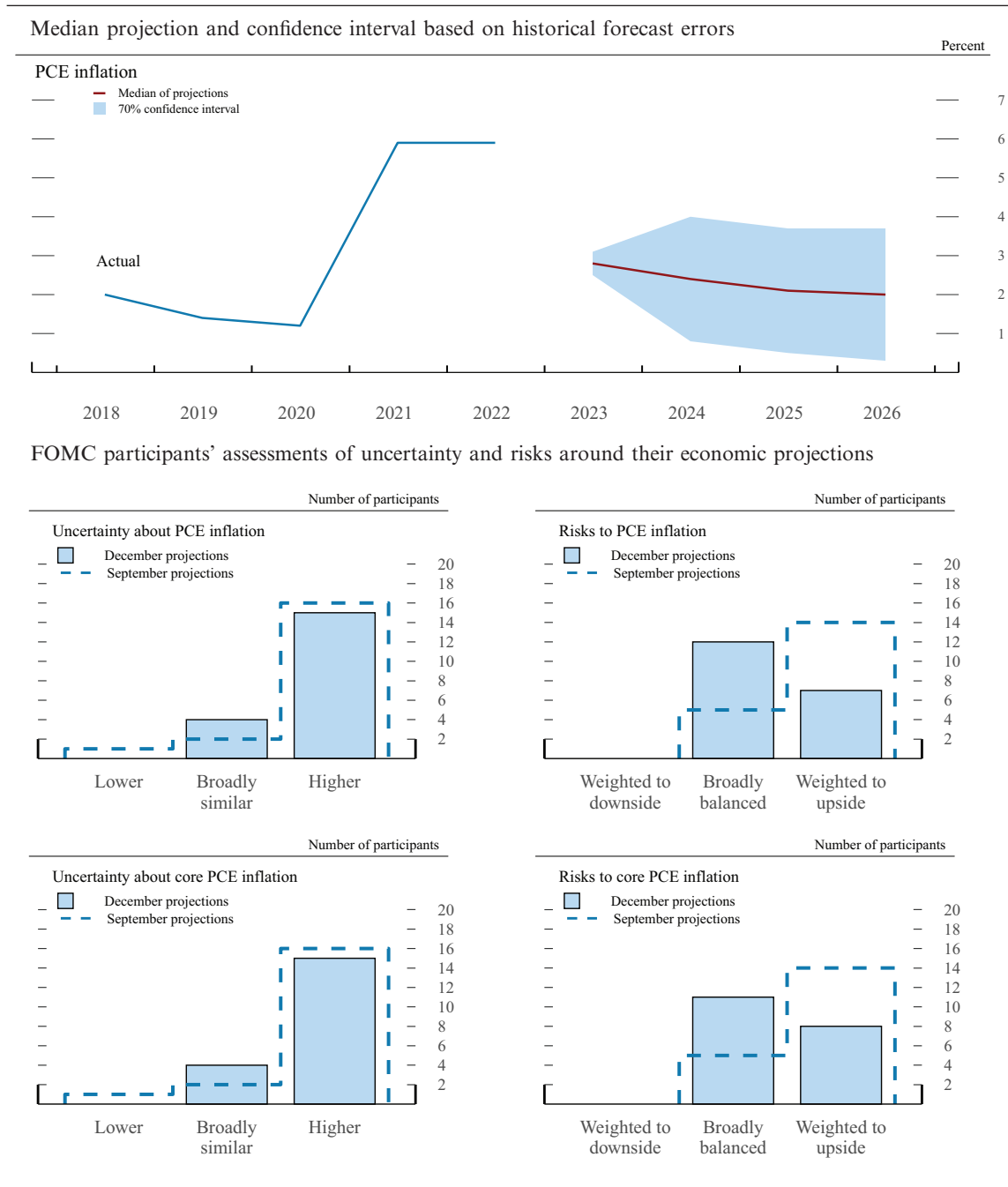
NOTE: The blue and red lines in the top panel show actual values and median projected values, respectively, of the percent change in real gross domestic product (GDP) from the fourth quarter of the previous year to the fourth quarter of the year indicated. The confidence interval around the median projected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



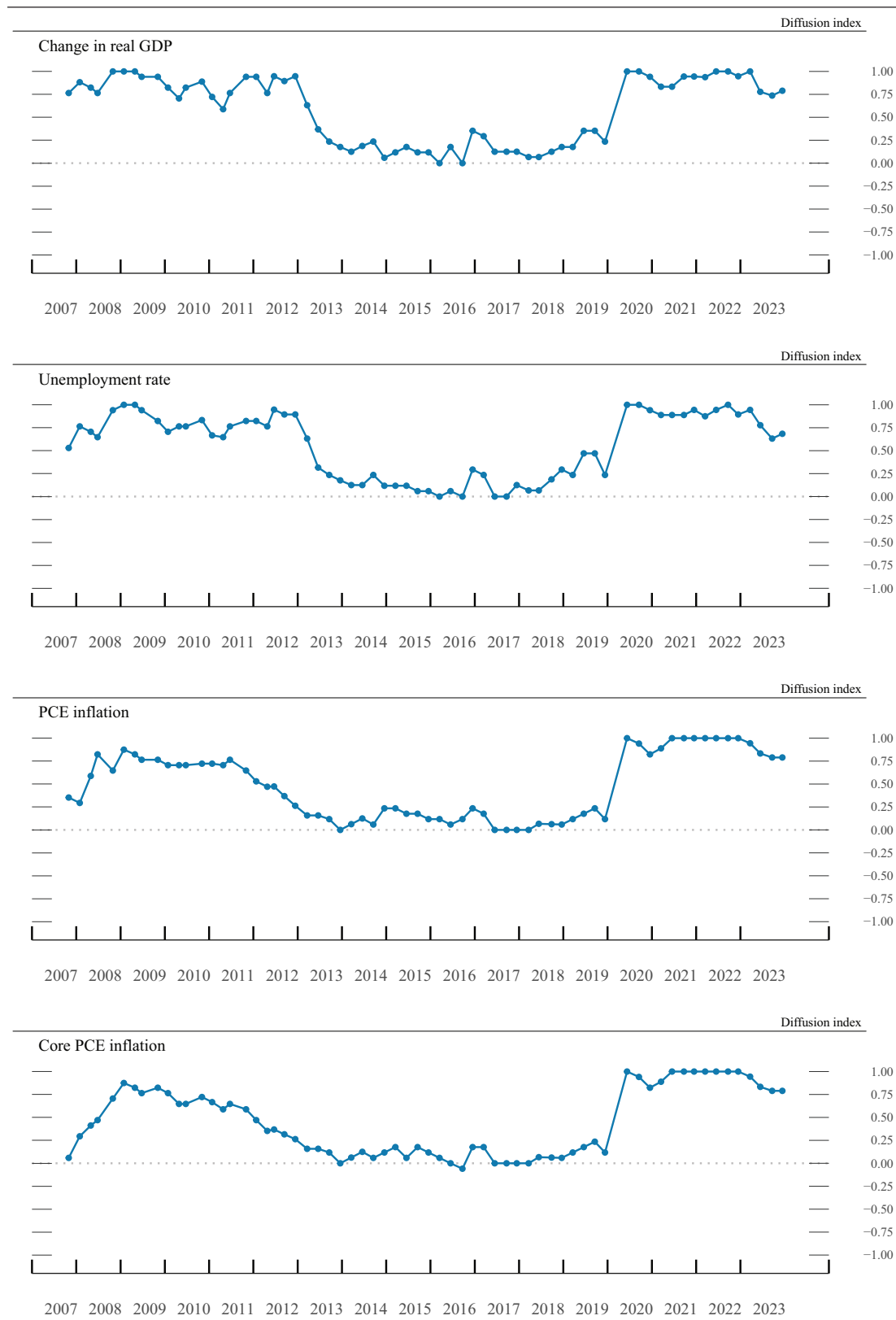
NOTE: The blue and red lines in the top panel show actual values and median projected values, respectively, of the average civilian unemployment rate in the fourth quarter of the year indicated. The confidence interval around the median projected values is assumed to be symmetric and is based on root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



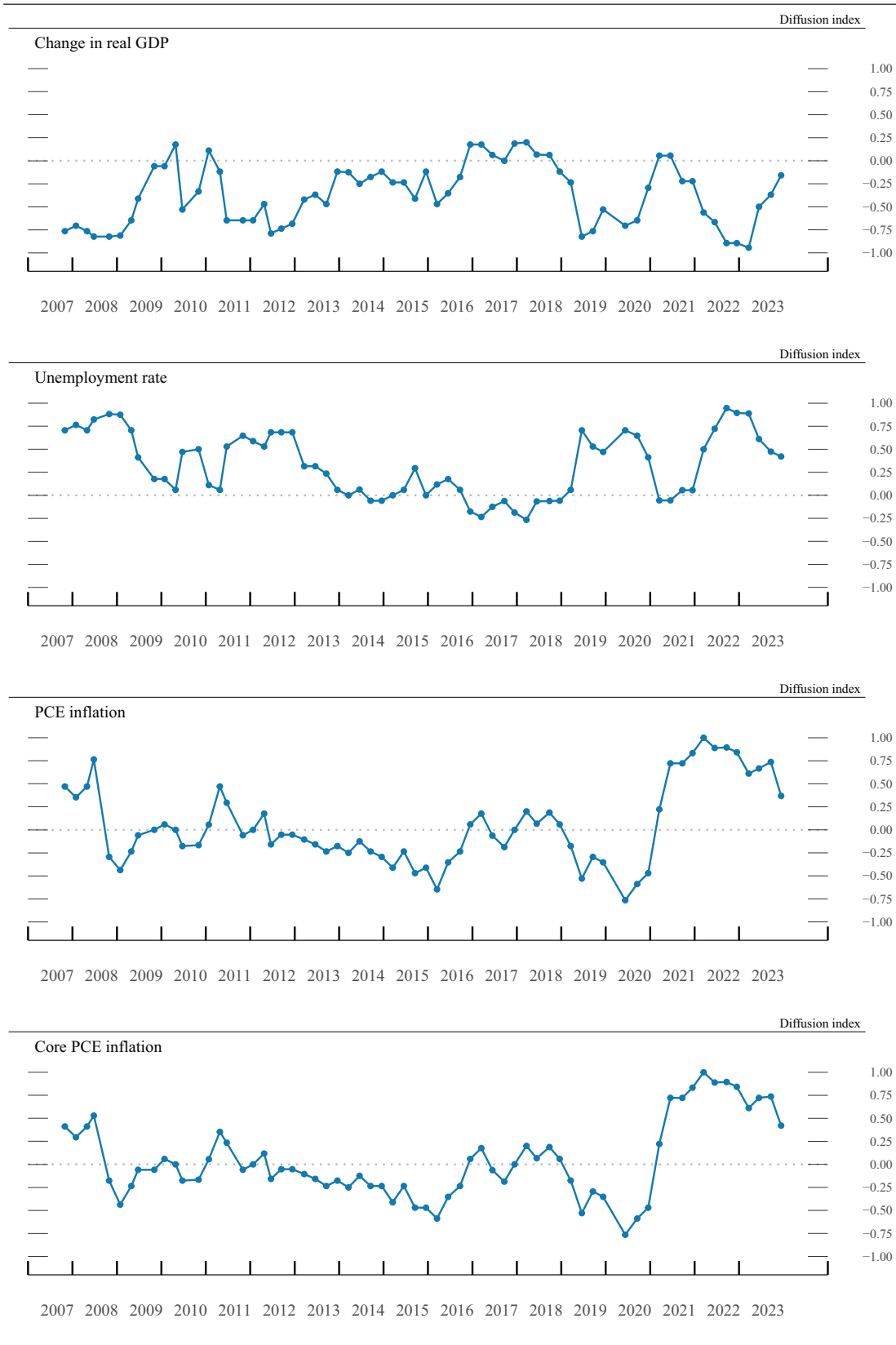
NOTE: The blue and red lines in the top panel show actual values and median projected values, respectively, of the percent change in the price index for personal consumption expenditures (PCE) from the fourth quarter of the previous year to the fourth quarter of the year indicated. The confidence interval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



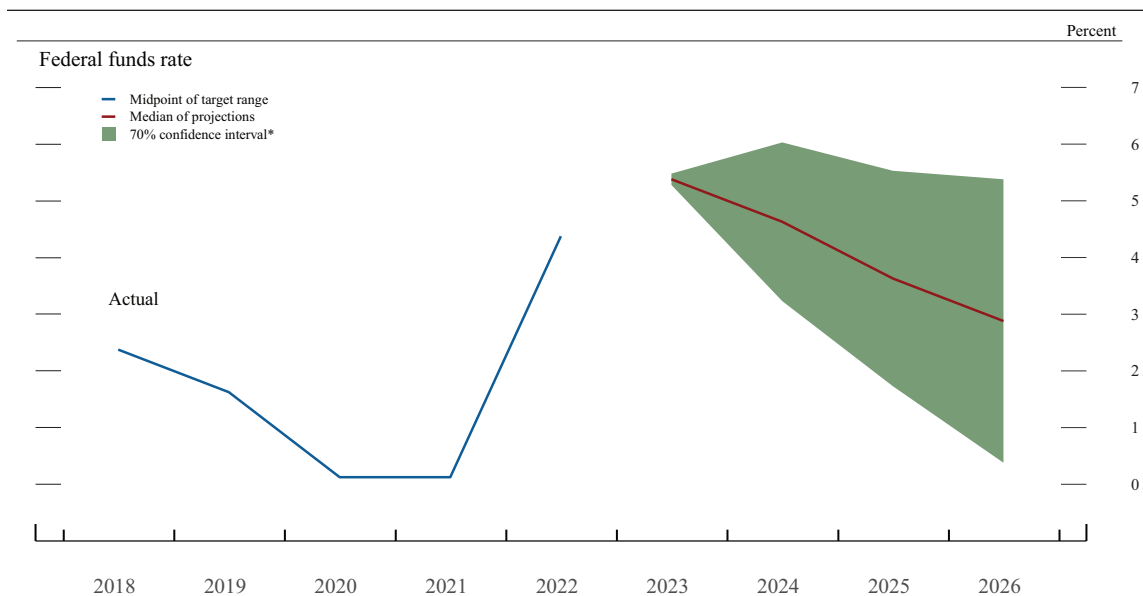
NOTE: For each SEP, participants provided responses to the question “Please indicate your judgment of the uncertainty attached to your projections relative to the levels of uncertainty over the past 20 years.” Each point in the diffusion indexes represents the number of participants who responded “Higher” 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	2026
Change in real GDP ¹	±0.8	±1.7	±2.1	±2.2
Unemployment rate ¹	±0.1	±1.1	±1.6	±2.0
Total consumer prices ²	±0.3	±1.6	±1.6	±1.7
Short-term interest rates ³	±0.1	±1.4	±1.9	±2.5

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 winter by various private and government forecasters. As described in the box “Forecast Uncertainty,” under certain assumptions, there is about a 70 percent probability that actual outcomes for real GDP, unemployment, consumer prices, and the federal funds rate will be in ranges implied by the average size of projection errors made in the past. For more information, see David Reifschneider and Peter Tulip (2017), “Gauging the Uncertainty of the Economic Outlook Using Historical Forecasting Errors: The Federal Reserve’s Approach,” Finance and Economics Discussion Series 2017-020 (Washington: Board of Governors of the Federal Reserve System, February), <https://dx.doi.org/10.17016/FEDS.2017.020>.

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

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 Reports* and those prepared by the Federal Reserve Board's staff in advance of meetings of the Federal Open Market Committee (FOMC). The projection error ranges shown in the table illustrate the considerable uncertainty associated with economic forecasts. For example, suppose a participant projects that real gross domestic product (GDP) and total consumer prices will rise steadily at annual rates of, respectively, 3 percent and 2 percent. If the uncertainty attending those projections is similar to that experienced in the past and the risks around the projections are broadly balanced, the numbers

reported in table 2 would imply a probability of about 70 percent that actual GDP would expand within a range of 2.2 to 3.8 percent in the current year, 1.3 to 4.7 percent in the second year, 0.9 to 5.1 percent in the third year, and 0.8 to 5.2 percent in the fourth year. The corresponding 70 percent confidence intervals for overall inflation would be 1.7 to 2.3 percent in the current year, 0.4 to 3.6 percent in the second and third years, and 0.3 to 3.7 percent in the fourth year. Figures 4.A through 4.C illustrate these confidence bounds in "fan charts" that are symmetric and centered on the medians of FOMC participants' projections for GDP growth, the unemployment rate, and inflation. However, in some instances, the risks around the projections may not be symmetric. In particular, the unemployment rate cannot be negative; furthermore, the risks around a particular projection might be tilted to either the upside or the downside, in which case the corresponding fan chart would be asymmetrically positioned around the median projection.

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

(continued)

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

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

assessments of appropriate monetary policy and are on an end-of-year basis. However, the forecast errors should provide a sense of the uncertainty around the future path of the federal funds rate generated by the uncertainty about the macroeconomic variables as well as additional adjustments to monetary policy that would be appropriate to offset the effects of shocks to the economy.

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

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

ABBREVIATIONS

AFE	advanced foreign economy
BTFP	Bank Term Funding Program
COVID-19	coronavirus disease 2019
CRE	commercial real estate
DI	depository institution
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
GDI	gross domestic income
GDP	gross domestic product
JOLTS	Job Openings and Labor Turnover Survey
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
SOMA	System Open Market Account
S&P	Standard & Poor's
VIX	implied volatility for the S&P 500 index

